ICENSOS 2024
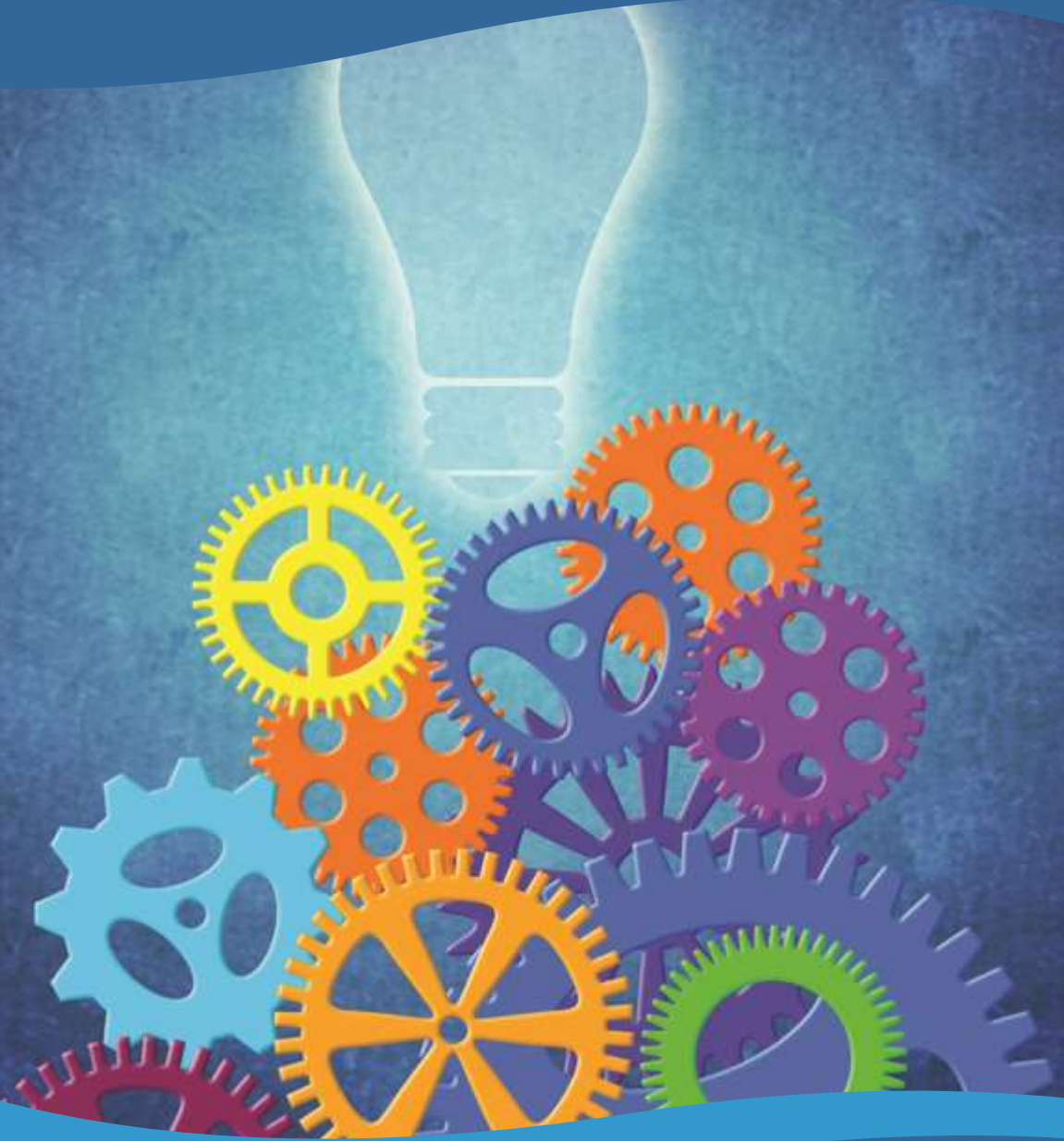
3rd International Conference on Engineering, Natural and Social Sciences ICENSOS 2024

May 16-17, 2024: Konya, Turkey

Abstract Book

ABSTRACT BOOK OF 3RD INTERNATIONAL CONFERENCE ON ENGINEERING, NATURAL AND SOCIAL SCIENCES ICENSOS 2024

ABSTRACT BOOK OF 3RD ICENSOS 2024:

16 – 17 May 2024

Konya, Turkey

Publication date: 30.05.2024

Publisher: All Sciences Academy

As this is a serial book published, it has ISBN. All abstracts were peer reviewed.

INTRODUCTION

We had the great honor of organizing the 3rd International Conference on Engineering, Natural and Social Sciences ICENSOS 2024. It was truly a great pleasure for us to greet a lot of participants from many different countries attending ICENSOS 2024! We firmly believe that the conference will become an important international event in the field of cross-industry discussion about innovations in Academic Studies.

Three cooperating organizations supported the four-day conference. There were 454 papers accepted for presentation at ICENSOS 2024, contributed from different countries. We had plenary speeches and several well-known scientists and experts, to give invited talks at different sessions.

The purpose of ICENSOS 2024 was to provide a forum for the participants to report and review innovative ideas, with up-to-date progress and developments, and discuss novel approaches to the application in the field of their own research areas and discuss challenges of doing science.

We sincerely hope that the exchange of ideas on doing research, science and improving education will help the participants, and international cooperation sharing the common interest will be enhanced.

On behalf the Organization Committee of ICENSOS 2024, we would like to heartily thank our cooperating organizations for all they have done for the conference. We would also like to thank the authors for their contribution to the proceedings; the participants and friends of ICENSOS 2024, for their interest and efforts in helping us to make the conference possible; and the Editorial boards for their effective work and valuable advice, especially the ICENSOS 2024 secretariat and the ICENSOS 2024 staff, for their tireless efforts and outstanding services in preparing the conference and publishing the Proceedings.

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433-443	Elektrik Nokta Direnç Kaynaklı DP 980 Çelik Saclarında Değişen Kaynak Akımı ve Kaynak Süresinin Çekme-Makaslama Gerilimine, Kaynak Çapına ve Dalma Derinliğine Etkisinin İncelenmesi		Özkan Toka, İbrahim Sevim	Turkey, Turkey	Submission 256
444-450	Early Childhood Autism Parent Education Programme (OÇEP): Development and Implementation Process		M. Abdulbaki KARACA	Turkey	Submission 258
451-455	Akademiden Girişimciliğe: Akademik Girişimcilik		Yusuf Esmer, Hüseyin Karagöz	Turkey, Turkey	Submission 269
456-462	Genelleştirilmiş Davis-Wielandt Yarıçap Sınırları		Orçun Yücel, Mehmet Gürdal	Turkey, Turkey	Submission 273
463-470	Operatörlerin Berezin Yarıçap Eşitsizliklerinin İlerletilmesi		Gamze Gül Erkan, Mehmet Gürdal	Turkey, Turkey	Submission 275
471-478	MoS2 Nanopartikül İlavesi ile Elde Edilen Al2O3:MoS2 Katkılı Oksit Kaplamanın Yapısal Özelliklerinin İncelenmesi		Süleyman ŞÜKÜROĞLU, Onur ÖZTABAK, Selahattin BUDAK	Turkey, Turkey, Turkey	Submission 281
479-486	Mikro Ark Oksidasyon (MAO) Yöntemi ile AZ31 Alaşımı Yüzeyine Büyütülen MgO ve MgO:B5H10NaO13 Kompozit Kaplamaların Yapısal Özellikleri ve Korozyon Direncinin İncelenmesi		Süleyman ŞÜKÜROĞLU, Yaşar TOTİK	Turkey, Turkey	Submission 282
487-498	Organizational and Management Operations with Knapsack Problem Algorithm		Ijibadejo Oluwasegun William, Mubarak Altamimi	Turkey, Turkey	Submission 283
499-513	Akıllı Teknolojik Sistemlerle Trafik Kazalarının Azaltılması, Önlenmesi ve Yolların Daha Güvenli Hale Getirilmesi		Mehmet Çelik, Berre Demir, Rüveyda Ertürk	Turkey, Turkey, Turkey	Submission 285

1017-1023	Stock Market Forecasting Based on Football Data Obtained by Data Mining	Yusuf Furkan Aktay, Ahmet Can Erol, Osman Altay	Turkey, Turkey, Turkey	Submission 548
1024-1028	Microstrip Antenna Design for 5G Sub 6GHz Applications Using Deep Learning	Reşit Karaoglu, Yakup Hameş, Mehmet Ali Belen	Turkey, Turkey, Turkey	Submission 552
1029-1034	Sağlık, Beslenme ve Kozmetik için Önemli Aloe vera (L.) Burm. f.'nin İn Vitro Üretimi Üzerine Genel Bir İnceleme	Muhammet Doğan	Turkey	Submission 555
1035-1039	Safranın (Crocus sativus L.) Besin Değeri ve Sağlık Üzerine Etkileri	Kadife Gül Karpuz, Muhammet Doğan	Turkey, Turkey	Submission 556
1040-1048	HAVA TAŞITI KABLOLARI VE AKIM TAŞIMA KAPASİTELERİ ANALİZİ: BİR UYGULAMA	Selin Buket YALÇIN, Kerem CİDDİ	Turkey, Turkey	Submission 557
1049-1059	Evaluation of the Structural Integrity of Flooded Pavements Utilizing FEM	Muhammad Junaid Ali Jouhar, Naveed Ahmad, Muhammad Ziad Bacha	Pakistan, Pakistan, Pakistan	Submission 563
1060-1066	Channel Estimation with Deep Learning for OFDM-IM Systems Under Nakagami-m Fading Channel Conditions	Omer Adiguzel, Ibrahim Develi	Turkey, Turkey	Submission 565
1067-1074	Applying Topic Modelling to Unveil Insights from Industrial Maintenance Records	Ömür Kuzucu, Aytuğ Onan	Turkey, Turkey	Submission 570
1075-1083	Dikey eksenli rüzgar türbinlerinde basamak ve slotun türbin performansı üzerine etkilerini araştıran çalışmaların derlemesi	Abdussamed Yıldız, Mehmet Seyhan	Turkey, Turkey	Submission 573
1084-1092	Havalimanı Hizmet Kalitesi Faktörlerinin Sezgisel Bulanık SWARA ile Ağırlıklandırılması	Ertuğrul Ayyıldız, İpek Gürsoy	Turkey, Turkey	Submission 575
1093-1099	Biotechnological Potential of Algae in Sustainable Development	Özgür Eren Zariç, Abuzer Çelekli	Turkey, Turkey	Submission 583
1100-1107	Efficiency of personnel management and its impact on labour productivity: the experience of agricultural enterprises in the Republic of Moldova	Stratila Alina, Țurcan Rina, Gheorghița Maria	Republic of Moldova, Republic of Moldova, Republic of Moldova	Submission 585
1108-1116	Automated Indoor Environment Optimization System	Daniyal Imani, Syeda Javeria Nadeem, Rabia Siddiqui, Sidra Saleem, Aman Kumar	Pakistan, Pakistan, Pakistan, Pakistan, Pakistan	Submission 586
1117-1123	Artificial Intelligence's role in recognizing and resolving student difficulties through personalized learning	Ilma Lili, Endri Xhina, Anxhela Kosta	Albania, Albania, Albania	Submission 591
1124-1128	Frequency Estimation of Power System Signal Using Extended Kalman Filter Algorithm	Sıtkı Akkaya, Gökhan Karaçoban	Turkey, Turkey	Submission 592
1129-1135	Readability Prediction of English Texts by Different Machine Learning Algorithms	Ekin Orhan Alpsoy, Osman Altay	Turkey, Turkey	Submission 593
1136-1142	Yüksek Fırın Cürufu ve İkameli Uçucu Kül Bağlayıcılı Sistemli Jeopolimerlere Molarite Etkisi	Osman ULUSU, Özer SEVİM, Gazi GÜNEL, Erdinç Halis ALAKARA	Turkey, Turkey, Turkey, Turkey	Submission 597
1143-1149	Makine Öğrenmesi Yöntemleri ile Diyabet Riski Tahmini	Eray YILMAZ, M. Hanefi CALP	Turkey, Turkey	Submission 599
1150-1156	Çimento Esaslı Harçlarda Pelet Külü Tozunun Dayanıma Etkisi	Gazi GÜNEL, Ahmet Said EKİNCİ, İlhami Demir, Özer SEVİM	Turkey, Turkey, Turkey, Turkey	Submission 600
1157-1163	Effect of high entropy FeCoNiCrNb nanocrystals on the structural properties of AL2024 alloys	Erhan Aksu, Selen Nimet Güner Gürbüz, Tuncay Şimşek, Muharrem Pul	Turkey, Turkey, Turkey, Turkey	Submission 610
1164-1173	Development Potential and Sustainability Index of a Thermal Power Plant	İlker Soyer, Oğuz Kaan Çinici, Mustafa Aktaş, Adem Acır	Turkey, Turkey, Turkey, Turkey	Submission 614
1174-1179	Prediction of Chicken Doner Cooking Level with Deep Learning Methods	Berkay Güler, Hakan Bayazıt Habeş, Mehmet Ali Çakmak, Osman Altay	Turkey, Turkey, Turkey, Turkey	Submission 621
1180-1194	Optimization of Camera Image Transfer Parameters with Genetic Algorithm and Neural Network for Industrial Machine Vision Applications with Image Quality Methods	Huseyin COSKUN	Turkey	Submission 624
1195-1203	Konjuge Linoleik Asit ile Çeşitli Kanser Türleri Arasındaki İlişki	Aybike Ceren KAYA, Gizem KOÇER, Çağla BULGAN, Reyhan İRKİN	Turkey, Turkey, Turkey, Turkey	Submission 625
1204-1210	Schiff Bazı ve Co(II) Kompleksinin Sentezi, Karakterizasyonu ve Antioksidan Aktivitelerinin İncelenmesi	Nevin TURAN, Ahmet SAVCI, Kenan BULDURUN	Turkey, Turkey, Turkey	Submission 627
1211-1214	Yapay Zekanın İstihdam Piyasası ve Sektörler Üzerindeki Etkisi	Sezin Güleryüz, Gamze Nur Yağcı, Emirhan Koç	Turkey, Turkey, Turkey	Submission 628
1215-1221	Yeni bir Schiff bazı ve Co(II) kompleksinin yapısal karakterizasyonu ve antioksidan aktivite çalışmaları	Kenan BULDURUN, Ahmet SAVCI, Nevin TURAN	Turkey, Turkey, Turkey	Submission 629
1222-1227	Artificial Intelligence Assisted Diagnosis of Gastric Dysplasia: A Convolutional Neural Network Application	Zeynep EROĞLU, Fatih ÖZYURT, Seda ARSLAN TUNCER, Birgül KARAHAN	Turkey, Turkey, Turkey, Turkey	Submission 630
1228-1231	Diyabetik Retinopatinin Hibrit Bir Yaklaşımla Sınıflandırılması	Cihan AKYEL, Bünyamin CİYLAN	Turkey, Turkey	Submission 632
1232-1243	Stock Price Prediction Using Deep Learning	Mustafa CEYLAN, Andaç	Turkey, Turkey,	Submission 634

	Algorithms on BIST	FINDIKÇI, Musa BALCI, Hüseyin AYDİLEK, Mustafa Yasin ERTEN	Turkey, Turkey, Turkey	
1244-1250	Automotive Fastener Production from Biobased Resin with Additive Manufacturing Method	Ecem Özdilek, Gökşan Şan	Turkey, Turkey	Submission 636
1251-1258	Some observations on quasi statistically rough convergence of double sequences in gradual normed linear spaces	Işıl Açık Demirci, Ömer Kişi, Mehmet Gürdal	Turkey, Turkey, Turkey	Submission 637
1259-1264	Uçucu Kül İkameli Yüksek Fırın Cürufu Bağlayıcılı Geopolimer Harçlara Molaritenin Etkisi	Buğra Aydın, İlhami DEMİR, Erdinç Halis ALAKARA, Gazi GÜNEL	Turkey, Turkey, Turkey, Turkey	Submission 642
1265-1273	Sürdürülebilir Yapı Malzemelerine İlişkin İnşaat Sektörünün Görüşleri	İbrahim Bektaş, Halil Serdengeçti Aksüt	Turkey, Turkey	Submission 646
1274-1283	Evaluation of state-supported projects given to forest villagers and cooperatives on a Turkish scale	Gökhan ŞEN, Büşra ERGÜN	Turkey, Turkey	Submission 653
1284-1289	A Dual-Band Microstrip Antenna Design for 2.4 and 5.1 GHz Wi-Fi Applications	Abubaker Osman Ahmed Osman, Bahadır Hiçdurmaz	Turkey, Turkey	Submission 655
1290-1298	İki Ucu Ankastre Mesnetli Düzgün Yayılı Yüklü Kirişin Varyasyonel Yöntemler Kullanılarak Maksimum Deplasmanının Hesaplanması	Şule TAŞ, Gökhan GÜÇLÜ	Turkey, Turkey	Submission 659
1299-1303	Yeniliklerin Yayılımı Kuramı Çerçevesinde Karar Destek Sistemlerinin Benimsenmesi	Elif Köseoğlu	Turkey	Submission 662
1304-1309	Nanopartikül katkılı fonksiyonel ipliklerin incelenmesi	Erhan Kenan ÇEVEN, Gizem Karakan GÜNAYDIN, SEMİHA EREN, İrem ÖZYURT	Turkey, Turkey, Turkey, Turkey	Submission 679
1310-1316	COPRAS Yöntemi ile İŞKUR İş Arama Kanalları Değerlendirmesi	Sezin Güleryüz, Gencer Saka	Turkey, Turkey	Submission 680
1317-1320	The Detection of Objects on Airport Runways by Using Embedded System	Metin Demirtas, Mehmet Devrim Yapici	Turkey, Turkey	Submission 682
1321-1332	TÜRKİYE'DEKİ ÜNİVERSİTELERDE REKREASYON EĞİTİMİNİN ANALİZİ	Cuma ECE, Mustafa Fatih Yiğit ARMAN	Turkey, Turkey	Mail Submission 6
1333-1340	ERGENLERDE AKRAN ZORBALIĞI VE MÜCADELE STRATEJİLERİ	Hilal Büşra Kaya, Serap GÜLEÇ KESKİN	Turkey, Turkey	Submission 68
1341-1353	Organic Pollutant Levels In Vlora Port	Esmeralda Halo, Bledar Murtaj, Jonida Tahiraj, Sonila Kane, Aurel Nuro, Kujtim Dule, Eriola Sila, Rigena Sema, Alda Kika, Ilma Lili, Anxhela Kosta	Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania	Submission 118
1354-1363	An overview of the positive and negative impact of post-Covid pandemic on the learning process of Albanian schools	Sanie Korini, Etleva Muleshku, Entela Tiko, Aurora Nuro, Arjeta Myrtaj, Brunilda Kasapi, Bledar Myrtaj, Aurel Nuro, Esmeralda Halo	Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania, Albania	Submission 120
1364-1368	GELENEKSEL PİŞİRME YÖNTEMLERİNE ALTERNATİF NOVEL PİŞİRME YÖNTEMLERİNİN UYGULANABİLİRLİĞİ: KUMPİR PATATES ÖRNEĞİ	Erdoğan BOZAN, Süleyman GÖKMEN, Abdülkadir DİLBER Abdullah ÇAĞLAR	Turkey, Turkey, Turkey, Turkey	Submission 262
1369-1375	Aging and Old Age Homes: A Case Study of Structural Changes in Family Institution	Madieha Akram	Pakistan	Submission 287
1376-1385	The use of Olive Mills Wastewater as a water replacement in concrete mixes	Marwan Shuaibi, Khalil Qatu	Palestine, Palestine	Submission 391
1386-1390	Examination into the impact of market demand change on asymmetric cost behavior	Haider Karim Katham, Inaam Mohsin Almusawi, Sarah Essam Hasan, Karrar Abdulellah Azeez	Iraq, Iraq, Iraq, Iraq	Mail Submission 7
1391-1396	On the analysis of capacitance curves at the different frequencies of an Ag/Au/WOx/nSi heterojunction	Murat GÜLNAHAR	Turkey	Submission 683

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3RD INTERNATIONAL CONFERENCE ON ENGINEERING, NATURAL AND SOCIAL SCIENCES ICENSOS 2024
MAY 16-17, 2024

30.05.2024

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Türkiye dışından toplam 25 farklı ülkeden (Fas, Cezayir**,** İran, Slovakya, Filistin, Ukrayna, Kuzey Makedonya, Azerbaycan, Benin, Yemen, Malezya, Kosova, Pakistan, Arnavutluk, Macaristan, Suudi Arabistan, Moldova, Irak, Nijerya, Çin, ABD, Bulgaristan, Kanada, Fransa, Gürcistan) katılım sağlanmış olup, 454 adet bildirinin 254 (%55,94) tanesi yabancı katılımcı tarafından sunulmuştur.

Kongremize ilginiz için teşekkür ederiz.

Saygılarımızla,

All Sciences Academy

3RD INTERNATIONAL CONFERENCE ON ENGINEERING, NATURAL AND SOCIAL SCIENCES ICENSOS 2024
MAY 16-17, 2024

30.05.2024

16-17 Mayıs 2024 tarihlerinde MEET üzerinden çevrimiçi olarak gerçekleştirilen 3rd International Conference on Engineering, Natural and Social Sciences ICENSOS 2024 konferansı MART DÖNEMİ DOÇENTLİK BAŞVURU ŞARTLARI yönetmeliğinin 2. bölümde yer alan Uluslararası Bilimsel Toplantı tanımlaması "Farklı ülkelerden bilim insanlarının bilim kurulunda bulunduğu ve sunumların bilimsel ön incelemeden geçirilerek kabul edildiği toplantı." şeklindedir.

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2024 MART DÖNEMİ DOÇENTLİK BAŞVURU ŞARTLARI yönetmeliğinin 8. bölümde yer alan Bilimsel Toplantı tanımlamasının b bendindeki "Diğer Uluslararası/Ulusal bilimsel toplantının düzenlenme komitesinde, kurum/tüzel kişilik/karar organı tarafından resmi olarak görevlendirilmiş üniversite/enstitü/bilimsel kurum/branş derneği akademisyen temsilcisi bulunması zorunludur." şeklindedir.

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Ayrıca görevlendirme yazıları ilgili konferansında özet ve tam metin kitapçıklarında yer almaktadır.

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04.09.2023

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We confirm that Ing. Ondrej Takáč, PhD. working at J. Selye University takes part in the organization committee of the conferences organized by of All Sciences Academy.

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Name of Responsible Person and Signature:	
Name and Surname	Sign:
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Date: 04.09.2023	

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Date: 04.09.2023	

16.08.2023

LETTER OF ASSIGNMENT

We confirm that Prof. Assoc. Dr. Admir Jançe, who is employed full-time as a lecturer, as well as holding the position of Head of the Imaging Department and Vice Dean of the Faculty of Technical Medical Sciences, takes part in the organization committee of the conferences organized by of All Sciences Academy.

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Date: 16.08.2023

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Dekan	
Tarih 15.09.2023	Prof.Dr. Adem YILMAZ DEKAN

15.09.2023

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Prof. Dr. Adem YILMAZ	
Dekan	Prof.Dr. Adem YILMAZ
Tarih 15.09.2023	DEKAN

04.09.2023

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We confirm that PaedDr. Krisztina Czakóová, PhD. working at J. Selye University takes part in the organization committee of the conferences organized by of All Sciences Academy.

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Date: 04.09.2023	

T.C.
ZONGULDAK BÜLENT ECEVİT ÜNİVERSİTESİ REKTÖRLÜĞÜ
Çaycuma Meslek Yüksekokulu Müdürlüğü

Sayı : E-84604848-903.07.04-371012   01.11.2023
Konu : Bilimsel Toplantı Görevlendirme

İLGİLİ MAKAMA

İlgi   :   Öğretim Üyesi Doç. Dr. Nermin KİŞİ'nin 30.10.2023 tarihli dilekçesi.

     Yüksekokulumuz Yönetim ve Organizasyon Bölümü Öğretim Üyesi Doç. Dr. Nermin KİŞİ'nin "All Sciences Academy Yayınevi"nin düzenleyeceği bilimsel toplantıların düzenleme ve bilim kurullarında görev almasında Yüksekokulumuzca bir sakınca bulunmamaktadır. İş bu belge ilgilinin isteği üzerine tanzim edilmiştir.

     Bilgilerinizi ve gereğini rica/arz ederim.

Doç. Dr. Hikmet YAZICI
Meslek Yüksekokulu Müdürü

Activated carbon/ZnS nanocomposite adsorbent for adsorption of cationic dye from aqueous solution

Mourad Termoul[1*], Salima Attouti[1], Mokhtar Benzekri Benallou[1], Anissa Zerhouni[1], Benaouda Bestani[1], Nouredine Benderdouche[1]

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Abstract – The present work focused on the functionalization of activated carbon using zinc surfide nanoparticles (ZnS-NPs-AC) for removal of rhodamine B. Activated carbon loaded with zinc sulfide nanoparticles was synthesized by a simple and cost-efficient method. This new material was characterized by FT-IR, SEM and XRD. The aim of this study was to evaluate the suitability and effectiveness of activated carbon loaded with zinc sulfide nanoparticles (ZnS-NPs-AC) for Rhodamine B adsorption. The adsorption study was carried out in batch mode and the parameters influencing adsorption, including pH, contact time and adsorbent dose, were optimized. In general, adsorption process parameters have a significant effect on percent removal. Adsorption was studied using three (03) isotherm models, Langmuir, Freundlich and Temkin. The equilibrium data for Rhodamine B removal follow strongly the Langmuir monolayer adsorption with a high adsorption capacity in a short time. The highest R^2 values were obtained with the Langmuir model (0.98). The adsorption capacity, qm, was 230 mg·g^{-1} at an initial pH of 6 and an equilibration time of 120 min at a temperature of 20°C and an initial dye concentration of 50-500 mg·L^{-1}. The effect of temperature shows that adsorption is endothermic with $\Delta H = 6.205$ kJ·mol^{-1}, $\Delta S = 47.6$ J mol^{-1}·K^{-1} and a decrease in Gibbs energy (ΔG = -8.56 to -28.63 kJ·mol^{-1}). The kinetic study showed that RhB dye adsorption follows the pseudo-second-order kinetic model and intraparticle diffusion. In addition, the adsorption mechanism of RhB-ZnS-NPs-AC is proposed, comprising three steps. The synthesized adsorbent is compared with other adsorbents in the literature, and indicates that the ZnS-NPs-AC nanocomposite used in this study showed better results at high adsorption capacity compared with commercial activated carbon. The regeneration and reuse study suggests that the nano-adsorbent can be reused several times for purification/adsorption.

Keywords – Activated Carbon, ZnS Nanoparticules, Rhodamine-B, Adsorption

Singular Reaction-Diffusion System Arising from Quenching

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Abstract – This paper investigates a singular parabolic reaction-diffusion system with positive Dirichlet boundary conditions, which are commonly utilized in the modeling of the quenching phenomenon. The primary objective of this study is to establish conditions that guarantee both finite-time quenching and the global existence of solutions for the system under consideration. By addressing this problem, the paper provides a theoretical framework for analyzing and simulating quenching phenomena, thereby offering valuable insights into the behavior and properties of the systems involved. These findings contribute to our understanding of the dynamics of singular parabolic reaction-diffusion systems with positive Dirichlet boundary conditions, shedding light on the fundamental mechanisms underlying the quenching phenomenon and paving the way for further advancements in this area of study.

Keywords – Reaction-Diffusion System, Quenching, Singular Parabolic Equations

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Quenching Reaction-Diffusion Systems in Bioengineering and Life Sciences

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Abstract – This paper delves into the investigation of the quenching phenomenon in reaction-diffusion systems and emphasizes its significance in various fields. The central focus of this chapter revolves around the analysis of a specific type of parabolic singular reaction-diffusion models that incorporates positive Dirichlet boundary conditions. The main objective is to establish the sufficiency of certain conditions that lead to quenching within a finite time frame while also demonstrating the global existence of solutions for the system. What sets this paper apart is the simplicity of the conditions imposed on the nonlinearity, which allows for a wide range of possibilities when choosing it. This simplicity facilitates the application of the model to numerous singular reaction-diffusion phenomena encountered in practical scenarios. To further strengthen the findings, the paper presents various real-world applications in the fields of bioengineering and life sciences, highlighting the practical relevance of quenching phenomena in these domains.

Keywords – Singular Reaction-Diffusion Equation, Quenching Phenomenon, Global Existence, Parabolic Problem

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Study of Stress Distribution in L-Shaped Walls with Openings under Intense Seismic Conditions on Various Soil Types

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Abstract – This article contributes to deepening our understanding of the distribution of compression, tension, and shear stress in reinforced concrete mid-rise building shear walls. These L-shaped shear walls include openings that can account for up to 50% of the total wall area. To conduct this study, seismic performance analyses of the buildings were carried out using ABAQUS software on four distinct types of soils, subjecting the buildings to a high-intensity earthquake (Zone III). Three wall thicknesses were considered: 15 cm, 20 cm, and 25 cm. The analysis results demonstrate that the use of thicker walls proved to be effective in reducing stresses, as expected, while also meeting the strength requirements. Furthermore, increasing the openings up to 30% in the shear walls allowed for a reduction in shear stress. However, it is important to note that the observed stresses varied depending on the type of soil and the percentage of openings in the shear walls.

Keywords – Buildings, Reinforced Concrete, Vertical Openings, Acceleration Coefficient.

Applications of MAX phases on aerospace engineering

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***Abstract** –* MAX phases, a class of layered ceramics with promising mechanical and thermal properties, are gaining attention in aerospace engineering. Their unique combination of high-temperature stability, lightweight nature, and resistance to oxidation presents an exciting avenue for enhancing the performance and durability of aerospace materials. MAX phases exhibit remarkable mechanical properties, such as high elastic modulus and fracture toughness, making them suitable for applications in aerospace structures subjected to high mechanical loads. Furthermore, their thermal stability allows them to withstand extreme temperatures encountered in aerospace environments, making them attractive for use in engine components, thermal protection systems, and aerospace structures. Additionally, MAX phases' resistance to oxidation can mitigate material degradation in high-temperature environments, improving the longevity of aerospace components and reducing maintenance costs. This article explores the potential applications of MAX phases in aerospace engineering, highlighting their advantages and discussing ongoing research efforts to further optimize their properties for aerospace applications

Keywords – MAX Phases, Aerospace, Engine, High Temperature

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Using online map resources in software to visualize different types of maps in Science of Earth

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Abstract – Earth Sciences, especially Geology and Geography, very often use spatial data in their research. For quick and effective visualization of spatial data, ready-made online basic or specialized (geological, geographical, etc.) maps are needed, which would provide a quick visualization of the location of the research and plotting the preliminary results of the research. There is a growing interest in the rapid creation of various types of maps by adding data in various formats (shp, wms, qms, wfs, geojson, etc.) to online base maps of various types. In recent years, a variety of online resources have become popular, providing cartographic tools for quickly creating your own maps with a large number of tools, and maximally meeting the needs and intentions, containing ready-made layouts for printing various types of maps with coordinate grids.

The abstracts demonstrate online resources for viewing and downloading such ready-made maps or their elements. Using the QuickMapServices plugin (https://plugins.qgis.org/plugins/quick_map_services/) of the free QGIS software for adding various sets of ready-made data and base maps (Google Maps, Openstreetmap Standart, Open TopoMap, etc.) to the project. Another commercial software is ArcGIS Pro (a powerful desktop GIS program) with ready-made basemap resources. It supports cross-product data sharing and allows users to work within the ArcGIS system through Web GIS using ArcGIS Online and ArcGIS Enterprise. The creation and visualization of graphic data in online maps of various GIS systems have their advantages and disadvantages, which must be taken into account for the visualization of research results on ready-made basic and other available specialized maps.

Keywords – Map Resources, Online Map, Openstreetmap, Basemap, Geology, Earth Of Science.

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Remediation of Industrial Polluted Water by Ternary Polymeric Composites

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Abstract: In recent years, wastewater from textile dyeing industry is a hazardous source of environmental pollution. To address this issue, various ways are used such as coagulation, filtration with coagulation, precipitation, adsorption, ion exchange, reverse osmosis and use of photocatalyst. Out of these methods, photocatalysis is most efficient. This work reports a facile in situ oxidative polymerization method used for the synthesis of g-C_3N_4/TiO_2/poly-o-chloroaniline) composites. The (g-C_3N_4/TiO_2/POC) composite was characterized by various techniques such as X-ray Diffraction method (XRD), Fourier Transform Infrared spectroscopy (FTIR), Scanning Electron Microscope (SEM) and UV-Visible spectroscopy. Then, degradation of dye was carried out employing ternary composite i.e. g-C_3N_4/TiO_2/POC. The efficiency of (g-C_3N_4/TiO_2/POC) Composite for degradation of dye was evaluated in aqueous medium under ultraviolet light.

Keywords: Polymer Composite, Methyl Orange, Photocatalytic Degradation.

Elaboration and characterization of photosensitive polymer resins used for 3D printing

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Abstract – The development of resins based on photosensitive polymer materials, such as urethane acrylate oligomers (UAOs) are important tasks of applied polymer science. They are an important class of commercial uv-curable oligomer due to their excellent application properties, such as good adhesion to most substrates, high impact and tensile strength, abrasion resistance and toughness combined with excellent resistance to chemicals and solvent, A common UAO is formed by a reaction of diisocyanate (D)with a polyol (P), forming a urethane prepolymer. To have radiation-curable oligomers, urethane prepolymer is blocked with acrylate in order to use them for 3D printing. which corresponds to the manufacturing of parts in volume by adding material. It is therefore an additive manufacturing technology allowing the development of objects by adding successive layers on top of each other using Computer Aided Design (CAD).

The study began with the synthesis of urethane acrylate oligomers and their chemical structures were characterized by FT-IR. After that uv-curing or photo-polymerization technique takes place, this process represents a major advance in the development of the coating, adhesive and ink industries. It provides many advantages such as instant drying, broad formulating range, reduced energy consumption, coating of heat sensitive substrate, high curing rate and low space and capital requirement for curing equipment. Uv-curable coating represents a class of coating with no or low volatile organic compounds and has been widely used in many industries.The main components of uv-curable formulation are an oligomer, a reactive diluent and a photo initiator.

Keywords – Photosensitive Polymer, Urethane Acrylic Oligomers (Uaos), 3D Printing, Additive Manufacturing And Reactive Diluent.

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Leveraging Case-Based Reasoning in Medicine: Enhancing Diagnostic Accuracy and Treatment Efficacy

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Abstract – Case-based reasoning (CBR) has emerged as a valuable approach in medical practice, offering a systematic method for problem-solving and decision-making based on past cases. In the medical field, where accurate diagnosis and effective treatment are paramount, CBR plays a crucial role in enhancing both. By leveraging the knowledge and experience encapsulated in previous cases, CBR helps medical professionals tackle complex and unique patient scenarios.

This paper explores the significance of CBR in medicine, focusing on its role in improving diagnostic accuracy and treatment efficacy. CBR facilitates the process of matching new patient cases with similar past cases, enabling physicians to consider a broader range of potential diagnoses and treatment options. This approach not only aids in avoiding diagnostic errors but also enhances the overall quality of patient care. Furthermore, CBR supports continuous learning and knowledge sharing among medical professionals. By analyzing and adapting past cases to current scenarios, healthcare practitioners can enhance their decision-making skills and stay updated with the latest medical advancements.

Keywords – Case-Based Reasoning (CBR), Medical Diagnosis, Treatment Efficacy, Diagnostic Accuracy, Healthcare Decision-Making.

Existence and Ulam-Hyers Stability in Delayed Variable-Order Fractional Differential Equations

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Abstract:This research examines the mathematical properties of psi-Caputo fractional differential equations (FDEs), which are characterised by variable order and finite delay. These aspects significantly complicate the analysis of these equations. By employing fixed-point theorems (FPTs) from existing scholarly works, we confirm the existence of solutions and establish their stability within the Ulam-Hyers framework.

To address these FDEs more effectively, we reframe the traditional variable order Riemann-Liouville (RL) FDE formulation using RL fractional integrals. This mathematical reformulation is crucial as it enables us to directly apply well-established fixed-point theorems. Through these classical theorems, we systematically investigate the existence of solutions, laying a solid groundwork for their verification.

Furthermore, our examination of Hyers-Ulam stability is based on time-honoured stability principles, which demonstrate that the solutions of such equations remain stable under minor perturbations. This stability analysis is essential, as it ensures that the solutions are not only theoretically sound but also practically reliable, even when subjected to slight deviations from ideal conditions.

Keywords – Hyers-Ulam Stability; Fractional Differential Equations; Variable Order; RL Fractional Integrals.

Advanced Stability Analysis of Synthetic Retaining Walls using Response Surface Methods

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Abstract – The use of geogrids, a type of geosynthetic material made from polymers, is widespread across various fields such as transportation, infrastructure, and structural projects. They are primarily employed to stabilize soil, reinforcing walls, strengthening subgrade soils, or embankments. Moreover, there's emerging potential for geogrids to be applied in remote sensing applications. To analyze the behavior of a synthetic retaining wall and predict its horizontal displacement and safety factor, finite element software is utilized. This involves studying the impact of soil properties and reinforcement parameters, including the vertical spacing between reinforcements (Sv), their length (L), and their normal stiffness (EA). A grey relational grade analysis is conducted to assess the extent of influence from these factors. Following the grey relational grade analysis, the input parameters for the response surface methodology (RSM) of the central composite design (CCD) type are determined. This methodology involves a composite central type fractional digital experiment plan. Through numerical simulation with Plaxis 2D results, the horizontal displacement and safety factor of the retaining wall are predicted.

The study establishes a functional relationship between the output variables (horizontal displacement and safety factor) and the input variables (L, Sv, EA) with high determination coefficients (R^2 = 99.63% for Ux and R^2 = 99.95% for Fs). These coefficients indicate the proportion of variation in the output variables explained by the model, confirming its adequacy. Consequently, central composite design models are deemed suitable for addressing geotechnical problems, particularly those concerning synthetic retaining walls, which exhibit highly complex and nonlinear behavior.

Keywords – Variance analysis, Identification of parameters, Optimization, Synthetic support, Reinforcement.

First report of *Fusarium asiaticum* and *Fusarium incarnatum* in Algeria, and evaluation of their pathogenicity on wheat crown rot

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Abstract – Fusarium crown rot (FCR), is one of the most serious wheat diseases. In this study one hundred and seventeen *Fusarium* symptomatic samples were collected in the North-east of Algeria. The obtained isolates (34), were identified on the basis of the morphological and the molecular data using phylogenetics. Accession numbers MW366557 and MW448396, were assigned by NCBI GenBank to isolate FE6 and FE8, identified as *Fusarium asiaticum* and *F. incarnatum*, respectively. A pathogenicity test was conducted on seven bread wheat cultivars (cv) to test their ability to induce FCR by the disease index (DS) parameter. The impact on coleoptile length and weight was estimated by the reduction parameters (RCL and RCW%). The results showed that the strains were saprophytic rather than pathogenic with negligible DS. A statistically significant decrease in coleoptile weight was recorded by FE6 ($P = 0.03 < 0.05$), and FE8 ($P = 0.017 < 0.05$). The cv. Medracen was mostly affected by this reduction with RCW% (11.90 and 35.96%). To the best of our knowledge, for the first time this work confirmed the existence of *F. asiaticum* and *F. incarnatum* species in Algeria.

Keywords – Fungus; Fusarium Asiaticum; Fusarium Incarnatum; Pathogenicity; Wheat

Biogas: A Sustainable Energy Solution for Reducing Greenhouse Gas Emissions

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Abstract - One of the greatest challenges that societies face now and in the future is the reduction of greenhouse gas emissions to mitigate climate change. Therefore, the preference for biogas over fossil fuels is crucial. Biogas can be produced from various organic waste streams or as a byproduct of industrial processes. It offers several advantages, including not only energy production but also the decomposition of organic waste through anaerobic digestion, mitigation of odor emissions, prevention of pathogen release, among others. Additionally, the nutrient-rich digested residues can be used as fertilizer for recycling nutrients back into fields. However, the quantity of available organic materials for biogas production is limited. Hence, there is a need for new substrates and advanced technologies for biogas production worldwide. Significant advancements have been made in addressing these limitations through the utilization of lignocellulosic biomass, the development of high-rate systems, and the application of membrane technologies in the anaerobic digestion process. The breakdown of organic matter requires synchronized movement of different groups of microorganisms with varying metabolic capacities. The unsustainable use of fossil fuels underscores the environmental impact of greenhouse gases, prompting research into renewable energy production from organic sources and waste. Global energy demand is high, with the majority being derived from fossil sources. Recent studies highlight anaerobic digestion as an efficient alternative that combines biofuel production with sustainable waste management. Technological research efforts are ongoing to enhance biogas production and quality within the biogas industry.

Keywords: Biogas, Greenhouse Gas Emissions, Anaerobic Digestion, Renewable Energy

Improving Energy Efficiency in Machine Tool processing: A Strategy Based on Genetic Algorithms

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Abstract – Mechanical processing is an important pillar of mechanical manufacturing, plays a vital role in the manufacturing industry, and requires a large amount of electrical energy. Cutting parameters have a significant impact on the productivity and energy efficiency of machine tools. Previous research has highlighted that the judicious selection of these parameters can contribute to optimizing energy consumption in manufacturing processes. The aim of this study is to propose a method to optimize energy consumption in steel processing based on genetic algorithm (GA). The key variables examined are spindle rotation speed (n) and feed rate (*f*); different depth-of-cut scenarios are evaluated to examine their impact on tool life and surface finish quality. Furthermore, the obtained results using different selection methods, such as stochastic and tournament techniques, are used to study the impact of changes in population size on the quality of the obtained solutions. Finally, the impact of other parameters of the genetic algorithm, such as crossover and mutation probabilities, on the overall performance of the optimization process is analyzed.

Keywords –Optimization, Cutting Parameters, Genetic Algorithm, Machining Process

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Visible Image Watermarking Using Bald Eagle Search Optimization Algorithm

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***Abstract** –* Due to the copyright problem, visible image watermarking has become an important issue. Embedding copyright-related data into the host image can be defined as image watermarking. Basically, image watermarking can be divided into two classes: visible and invisible. Watermarking methods that can be seen by human perception on the watermarked image are called visible image watermarking. The obtained watermarked images are used in many areas, from healthcare to security. In this study, a visible image watermarking method using the Bald Eagle search (BES) optimization algorithm is presented. The algorithm, proposed by Alsattar et al recently, solves optimization problems by mimicking the hunting behavior of bald eagles. BES computes the optimal fusion value of the hosting image and the watermark image. The function that maximizes the correlation coefficient between the watermarked and host image and the correlation coefficient between the extracted watermark and the watermark image is used as the fitness function. The algorithm is run 30 times independently of each other, and the mean value and standard deviation values are obtained. The obtained watermarked image is evaluated with well-known quality metrics. The obtained results are found to be satisfactory. It is compared with the widely known genetic algorithm and differential evolution algorithm and it was seen that BES competes with the others.

Keywords – Visible Image Watermarking, Bald Eagle Search Optimization Algorithm, Image Fusion, Quality Metrics.

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A study on the interaction and inhibition effect of some natural compound ligands with the 5p21 cancer receptor

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Abstract - Some spices that we consume with foods in daily life add taste and aroma to meals eaten. These spices are also very important for health. In this study, the interaction of the compounds (Carvacrol,Capsaicin,Curcumin), the main active ingredients in some spices, consumed very frequently in some societies, with 5p21, an important cancer receptor, has been determined by the chemical calculation method, and the interaction points and possible bonds that could be formed at the molecular level has been investigated to elucidate the mechanism.

Keywords: 5p21, Carvacrol,Capsaicin,Curcumin and Docetaxel

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Induction Machines Fault Classification Using Machine Learning Method

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Abstract – Induction motors are widely utilized across industries due to their efficiency, reliability, and affordability. Nonetheless, faults within these motors can precipitate significant issues such as unexpected shutdowns, decreased efficiency, and potential damage to other system components. Therefore, it's crucial to monitor and diagnose these faults promptly. This study suggests an innovative method for fault diagnosis using an enhanced Empirical Mode Decomposition (EEMD) combined with Convolutional Neural Network (CNN). The key idea is to train the CNN solely on datasets containing healthy conditions and single faults, excluding compound fault data during training. The effectiveness of EEMD and the proposed hybrid method is evaluated by analysing simulated vibration signals and a gearbox system experiencing a compound fault scenario, which includes both a minor and a severe fault. Results indicate the superior accuracy of the proposed approach in diagnosing compound faults and effectively identifying minor faults amidst more severe ones. This research paves the way for further exploration in bearing fault diagnosis, offering a promising solution for practical applications.

Keywords – Fault diagnosis, Convolutional Neural Network, Bearing, Vibration signal, Signal processing, EMD.

Impact of particle-substrate thermal exchanges in thermal spray simulation

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Abstract – This study delves into the realm of thermal spraying, a process in which a solitary tin particle is meticulously deposited and flattened through the intricate mechanisms of dynamic modeling and simulation, facilitated by the powerful Abaqus software suite. Central to the investigation is the meticulous consideration of the temperature-dependent thermomechanical characteristics inherent to both the particle and the substrate. Here, the study places particular emphasis on the intricacies of conduction-driven heat transfer, incorporating the nuanced interplay of variable thermal contact conductance. To ensure the robustness of the proposed model, thorough validation against existing literature data is meticulously conducted at the outset of the study. Subsequently, the temporal evolution of temperature and flattening factor during the impactful particle-substrate interaction is meticulously scrutinized. Remarkably, the study demonstrates that this comprehensive modeling approach significantly enhances our understanding of the complex phenomena underlying lamella formation and heat transfer processes inherent to the thermal spraying technique.

Keywords – Thermomechanical, Thermal Spraying, Dynamic Modeling, Conductance.

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Thermal analysis of particle-substrate interactions in thermal spray simulation.

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Abstract – This This study highlights the importance of metallic particle size distribution in determining the quality of thermal spray deposits. Using ABAQUS CAE, a numerical simulation is conducted, integrating experimental and numerical data from the literature. The focus is on understanding changes in droplet shape, temperature, and phase transitions during thermal spraying. Employing the finite element method within the Lagrangian framework, the governing equations are solved. Initial emphasis is placed on the impact of a tin droplet on stainless steel, with particular attention to substrate temperature. Numerical and experimental results are compared, revealing a strong agreement between simulation and observation. This emphasizes the utility of numerical simulations in elucidating thermal spraying processes and improving coating quality.

Keywords – Thermal Spray, Substrate, Simulation, Abaqus Cae.

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Enhancing Convergence in Membrane Element Analysis: Introducing a Novel Rectangular Finite Element Approach

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Abstract – This research introduces a novel rectangular finite element aimed at examining statistical properties of membrane elements. The element utilizes a strain-based approach and incorporates three external degrees of freedom at each corner node. Linear membrane strains are employed based on the analysis results, which indicate that this component exhibits superior convergence compared to other components and the reference solution. Several numerical examples demonstrate that effective convergence can only be achieved by employing a limited number of separate elements.

Keyword: Membrane Element Analysis, Finite Element Method, Strain-Based Approach, Convergence İmprovement, Rectangular Finite Element

Investigating the viability of utilizing bio-waste materials as eco-conscious alternatives for producing activated carbon

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Abstract – The pollution of water bodies with phenolic compounds, stemming from activities such as petroleum refining, plastics manufacturing, and ink production, presents a significant environmental challenge.

A novel porous carbon derived from Jujube seeds underwent chemical activation with KOH followed by pyrolysis at 800°C, resulting in activated carbon highly effective in removing phenols from aqueous solutions. The study investigated various parameters including contact time, initial metal ion concentration, pH, temperature, and adsorbent quantity on adsorption efficiency. Batch experiments focused on kinetics and equilibrium adsorption of phenol and 2-4 dichlorophenol. Optimal conditions were identified, with a pH of 7 favoring phenols adsorption. Adsorption data were fitted to Langmuir and Freundlich isotherms, with kinetics following pseudo-second-order rate kinetics. FT-IR spectroscopy revealed the presence of –COOH and C=O groups in the activated carbon, elucidating the adsorption mechanism. Maximum adsorption capacities were found to be 142.85 mg.g−1 for phenol and 250 mg.g−1 for 2-4 dichlorophenol.

Keywords – Removal; Jujuba Seeds; Phenols; Isotherm; Activated Carbon

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Time-dependent coupled harmonic oscillator systems with a dynamic coupling term

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Abstract – We present simple study of a time-dependent coupled harmonic oscillator systems in the presence of bilinear a *dynamic* coupling term $\lambda(t)P_x P_y$. Firstly, using the method of invariants and the technique of unitary transformation, we have simplified the Hamiltonian of the system. Then we derive the conditions for the decoupling. And we diagonalized the new invariant and found the corresponding eigenstates and eigenvalues. Finally, we constructed the coherent states associated with the system and we demonstrated that these form an overcomplete set which minimizes the quadratures defined by the ladder operators.

Keywords – Coupled Oscillator; Dynamic Coupling Term; Invariant Operator; Unitary Transformation.

Crystal Structure, HOMO-LUMO and Hirshfeld Surface Analysis of a New Organic Compound

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Abstract - A new organic compound, 2-[(2,4-Dimethoxybenzylidene)-hydrazono 1,2-diphenyl-ethanone] (DBHDE), its structural characterization has been carried out using the X-ray diffraction method. The compound DBHDE crystallizes in the P 2_1/c space group with Z=8 in the unit cell. It belongs to the monoclinic system. To support the experimental results, density functional theory (DFT) calculations were performed using the B3LYP functional with a 6-311G (d, p) basis set. All the theoretical results obtained are in perfect agreement with the experimental results. Furthermore, Highest Occupied Molecular Orbital (HOMO) and Lowest Unoccupied Molecular Orbital (LUMO) were studied extensively. The Hirshfeld surface and 2D fingerprints indicate H···H (48.8%) and C...H/H...C (28.4%) as the most relevant interactions in the crystal packing of DBHDE.

Keywords: DBHDE, X-ray, DFT, HOMO, LUMO.

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Investigating the Adsorption Efficiency of Biochar Derived from Biomass for Malachite Green Dye Removal

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Abstract – In this study, we explore the potential of seaweed-derived biochar as an adsorbent for the removal of malachite green dye from aqueous solutions. The biochar was prepared through pyrolysis of seaweed biomass under controlled conditions. The adsorption capacity of the biochar was evaluated through batch adsorption experiments, where the effects of various parameters such as contact time, initial dye concentration, and biochar dosage were investigated. The results indicated that the seaweed-derived biochar exhibited significant adsorption capacity for malachite green dye, with a high adsorption capacity observed under optimal conditions. Kinetic and isotherm models were employed to analyze the adsorption process and the data fitted well with the pseudo-second-order kinetic model and Langmuir isotherm model, suggesting a monolayer adsorption mechanism with homogeneous adsorption sites. Furthermore, the adsorption performance of the seaweed-derived biochar was compared with other commonly used adsorbents, highlighting its potential as an efficient and eco-friendly adsorbent for malachite green dye removal from wastewater. This study underscores the promising application of seaweed-derived biochar in environmental remediation efforts aimed at mitigating dye pollution in aqueous systems.

Keywords – Biochar, Seaweed, Malachite Green Dye, Adsorption

Study of the effect of site category on the dynamic behavior of a building

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Abstract – In this article, we have studied the effect of site category on the dynamic behavior of a ten-story building with regular plan and elevation. The sites are classified into four categories based on the mechanical properties of the soils they consist of. Studying the dynamic response of a structure requires selecting an appropriate dynamic model that most accurately reflects the nature of the real system. The dynamic model we have adopted for our analysis is a vertically fixed base shear model. Masses are considered concentrated at the center of gravity of each level and work in three degrees of freedom (3DOF): two translations along (x, y) and one rotation along (z). The calculation of the overall seismic force at the base of a building can be done using the spectral modal method. The spectral modal method is the most widely used method for seismic analysis of structures. With this method, the maximum effects generated in the structure by seismic forces, represented by a response spectrum, are sought for each mode of vibration. These effects are then combined to obtain the structure's response. Finally, a comparative study is conducted on the dynamic response of the structure with the four categories of sites (category S1 rocky site; category S2 firm site; category S3 loose site; and category S4 very loose site).

Keywords – Site Category, Dynamic Response, Calculation Spectrum, Spectral Modal Analysis.

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Protection of the city's cultural heritage also with the help of partial 3D models

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Abstract – In our paper, we will focus on the creation of partial as well as full 3D models of real objects in the context of cultural heritage protection. In the case of partial 3D models, we will focus on smaller objects that present the aesthetic aspect of everyday life captured in common building architecture. These are often already of significance to us today as cultural heritage. We value them for their age and as a legacy of past generations. We can read in them not only a way of life, but also their aesthetic sensibility, cultural atmosphere, social tradition and the so-called Genius Loci. It often happens, however, that in cities rich in historical architecture, modern sculptures or works of architecture by local artists begin to appear, set against the backdrop of the magnificent monuments of the past. These works are also an expression of the modern sensibility of ordinary citizens and deserve our attention. We will show 3D models of such sculptures as well, so full 3D models. In our paper we will show some of these monuments of the city of Gdańsk and around also pointing out not only the historical value of the 3D models, but also the typical statistical parameters describing the 3D models presented by us. In the conclusion of the paper we will offer a methodology for the creation of such models with the help of commonly available technical means of modern times, i.e. for everyone who has a mobile phone and access to the Internet.

Keywords – Cultural heritage, Photogrammetry, 3D models, partial 3D models, OPPO Reno 5z

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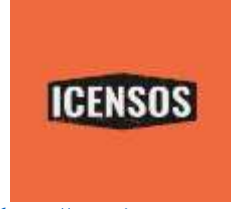
Experimental Investigation of Small Scale Pelton Turbine Characteristics

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Abstract – Hydraulic turbines are used in hydroelectric power plants for generation of electricity. The potential energy of water is converted to mechanical energy via hydraulic turbines and then mechanical energy generated by a hydraulic turbine is converted to electricity via a generator. The hydraulic turbines are separated into two main parts i.e. action and reaction turbines. Action turbines namely Pelton, Turgo etc. are used at high heads and low flow rates while the reaction turbines namely Francis, Kaplan, Uskur etc. are used at the lower heads and flow rates. It is very important to determination of hydraulic turbine characteristics such as power, efficiency and specific speed at various working conditions for operational limits, sustainability economy and maintenance period of them. Experimental investigation of hydraulic turbines characteristics is a more realistic method, while it is possible to determine by means of numerical methods at lower cost. However, experimental investigation is quite difficult and costly due to the hydraulic turbines are quite large in size. Therefore, small scale models are used in the experimental investigation for reduction of the cost. In this study, an experimental investigation was completed for the determination of the small scale Pelton turbine characteristics at different working conditions by using a specific experimental setup. The results of the study show that generated power by the turbine increases with the increasing of turbine head. It is also determined that efficiency of the turbine reaches its maximum level at a specific flow rate and then it decreases.

Keywords – Renewable energy, Hydraulic turbines, Pelton turbine, Turbine characteristics, Efficiency

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Eigensolution and Thermodynamic Properties of time dependent Screened Kratzer potential using the Nikiforov-Uvarov-Functional Analysis method

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Abstract – In this research, the Schrödinger equation is solved analytically with the time dependent Screened Kratzer potential. This potential is not studied in the literatures. The Kratzer potential is known to have a long-range attraction and a repulsive part. The integration of these parts makes the potential reliable, as far as its vibrational and rotational energy eigenvalues are concerned. The Kratzer potential also approaches infinity as the inter-nuclear distance approaches zero. This is because of the repulsion that exists between the molecules of the potential .This potential has been used to describe molecular structure between two atoms. Its applications span into quantum chemistry and atomic and molecular physics. The eigenvalue energy and its corresponding normalized wave function are obtained using the Nikiforov–Uvarov-Functional Analysis (NUFA) method by applying a Green-Aldrich approximation scheme to the centrifugal term in closed form. The energy equation obtained was used to calculate the vibrational partition function from where the thermodynamic properties such as the vibrational mean energy, vibrational free energy, vibrational entropy and vibrational specific heat capacity, are calculated. These thermodynamic functions are derived by employing the Poisson summation formula. The wave function obtained is written as a Gauss hypergeometric function. Our results are agreed with other methods.

Keywords – The Nikiforov–Uvarov-Functional Analysis Method, Time Dependent Schrödinger Equation, Screened Kratzer Potential, Wave Function, Thermal Properties; Partition Function; Entropy.

Enhancing E-Learning Resource Recommendations through Sentiment-Aware Personalization

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Abstract –The abundance of educational resources in e-learning platforms necessitates effective recommendation systems to guide learners towards relevant and engaging materials. This paper presents a novel approach that incorporates sentiment analysis to capture learners' preferences and emotions towards different resource types. The proposed methodology employs sentiment analysis on learners' interactions and feedback, such as ratings, comments, and forum posts, to identify their positive or negative sentiments towards specific resources, topics, or learning styles.

This sentiment information is then integrated into the recommendation algorithm, allowing it to suggest resources that align with learners' emotional responses and preferences. Additionally, the system utilizes collaborative filtering and content-based filtering techniques to further personalize recommendations. Collaborative filtering identifies similar learners and recommends resources positively received by peers with comparable preferences, while content-based filtering matches resources with individual learners' profiles based on learning goals and prior knowledge.

The sentiment-aware recommendation system has been evaluated using real-world data, demonstrating improved recommendation accuracy, learner engagement, and overall satisfaction compared to traditional approaches by providing personalized recommendations that align with learners' academic needs and emotional responses.

Keywords –E-Learning, Recommender Systems, Educational Resources, Sentiment Analysis, Learner Preferences, Personalization

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ROLE OF THE MIDWIFE IN THE SCREENING OF CONGENITAL MALFORMATIONS

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Abstract – The midwife represents the referring health professional for childbirth. She has the necessary skills to provide comprehensive monitoring of the newborn. Fetal malformations are detected before birth to schedule a delivery in a specific structure. These pathologies represent emergencies due to their treatment at birth. Other malformations cannot be detected or only become apparent after birth. Rapid and appropriate care from midwives is essential.

The first clinical examination aims to detect any possible physical abnormality early. It must be systematic and rigorous. It includes an assessment of the newborn's condition by calculating the Apgar score.

Faced with any pathological situation or anomaly, the midwife must hand it over to the pediatrician or pediatric surgeon.

It is necessary to have acquired knowledge through theoretical education and internships.

Currently, the field of competence of midwives is very vast. However, they do not yet exploit all their skills. This cannot be possible given the workload she has.

A refresher course with practical training is necessary. Projects must be carried out so that the midwife can perform the clinical examination of the newborn on the first day of life.

Keywords – Midwife, Newborn, Delivery, Clinical, Pathologies.

True testicular ectopia: report of a case

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Abstract – Testicular migration anomaly (TMA) is the most common malformation syndromic entity of the genital organs in male children, with very different clinical situations and specific treatments. Testicular ectopia represents less than 1% of testicular migration disorders. This means that clinically the testicle is not in the scrotal position.

An eight-year-old male patient was admitted to our department of pediatric surgery, circumcised, and presented to our specialized pediatric surgery consultation for an empty left bursa, the abdominopelvic ultrasound brought back by his parents did not objectify the presence of the testicle on its normal path, a testicle found at the root of the thigh.

The treatment was surgical, the orchidopexy was performed after the release of the cord elements. The patient had favorable postoperative outcomes after a follow-up of 36 months.

In cases with the undescended testis, it should be considered that the highlighted pathology may be testicular ectopia. The percentage of this pathology represents less than 1%, hence the need for a careful clinical examination for appropriate and simple management.

Keywords – Ectopia, Malformation, Children, Surgical, Undescended Testis

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Spontaneous rupture of hydatid cyst of liver in the peritoneal cavity with intact proligerous membrane: a case report

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Abstract – Echinococcosis is a cosmopolitan zoonosis, which is endemic in many parts of the planet. Countries around the Mediterranean were the known endemic regions for cystic echinococcosis including Algeria. This zoonosis is due to the presence and development in humans - accidental intermediate host - of the larval form of a cestode of the genus Echinococcus granulosus.

Intraperitoneal rupture of the hydatid cyst of the liver is rare (1 to 2%). It exposes to two risks, peritoneal dissemination and acute anaphylaxis. Intraperitoneal rupture of the hydatid cyst of the liver in the peritoneum with an intact proligerous membrane is unusual.

We report the case of a 7-year-old boy, with no particular pathological history. He consults for sudden onset abdominal pain and acute urinary retention for 2 days.

Abdominopelvic ultrasound objectives two hydatid cysts of the liver. This is associated with a para-vesical pelvic cystic formation measuring 92x53 mm.

Surgical treatment was necessary, a first laparoscopy was done, the exploration found a hydatid cyst of segment IVa ruptured and emptied of its proligerous membrane. This membrane remained intact intraperitoneally, with a second cyst at the level of segment IVb. A conversion to classical surgery was decided. The treatment consisted of treatment of the cysts with the extraction of the proligerous membrane without breaking it associated with the peritoneal toilet. Antiparasitic treatment with albendazole was prescribed. The postoperative course was simple. No recurrence after 5 years.

Complicated cystic echinococcosis is rare; intraperitoneal rupture with an intact proligerous membrane is an even more exceptional entity and is rarely described in the literature.

Surgical treatment in this case is urgently required, accompanied by antiparasitic treatment, thus avoiding the risk of recurrence.

Keywords – Echinococcosis, Zoonosis, Proligerious, Intraperitoneal, Rupture

Paratesticular rhabdomyosarcoma

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Abstract – Paratesticular rhabdomyosarcoma is a rare and aggressive tumor in children. It represents 7% of testicular tumors in children. Several forms are described and the embryonic variant is the most common. The treatment is multimodal, combining surgery, chemotherapy, and radiotherapy; early diagnosis determines the prognosis.

We report the case of a 7-year-old child, with no particular pathological history, who consulted for a voluminous painless bursa that had been present for 2 months and was gradually increasing in size. The ultrasound performed shows a large left intrascrotal extratesticular hypoechoic mass.

Biologically: alphafetoprotein and BHCG are negative

An orchidectomy was carried out, the histology came back in favor of paratesticular rhabdomyosarcoma.

Paratesticular RMS is a rare tumor. It requires early diagnosis and assessment of thoraco-abdominopelvic extension. The treatment is currently well codified combining surgery, polychemotherapy and radiotherapy that the prognosis has clearly improved. Adequate long-term monitoring by clinic and especially imaging must be established in order to detect relapses which are generally fatal.

Keywords – Rhabdomyosarcoma, Tumor, Children, Orchidectomy, Testicular.

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Percutaneous nephrostomy in children

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Abstract – Percutaneous nephrostomy placement is one of the basic procedures in pediatric urology. Percutaneous nephrostomy is a minimally invasive procedure, often performed urgently for a vital indication, this procedure must be mastered. In recent years, this technique has evolved.

We report our experience with this technique.

A five-year-old patient underwent an emergency nephrostomy for acute renal failure in a single kidney with hydronephrosis.

In the operating room under general anesthesia, the target calyx is visualized by ultrasound that visualize also the needle. It also allows

direct insertion of a guidewire over which a nephrostomy tube can be placed.

Once the needle is inserted into the calyx, urine is aspirated both to send to the laboratory for culture and sensitivity and to help decompress the system.

The guide wire will be removed and the drain will be attached to the skin with stitches.

Its end will then be connected to a collecting system.

Percutaneous nephrostomy is a simple, rapid, and safe drainage procedure. Requires suitable equipment and an operator trained in this type of technique.

Nephrostomy is a minimally invasive method and integral to managing renal dilatations. Learning how to place a nephrostomy is fundamental for future pediatric surgeons.

Keywords – Nephrostomy, Ultrasound, Hydronephrosis, Percutaneous, Children

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INFECTED URACHAL CYST: about a case

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Abstract – The pathology of the urachus, although quite rare, deserves to be known

The urachal cyst is a cavity hanging along the urachus between the umbilicus and the bladder.

Most urachal cysts remain asymptomatic and the diagnosis is often carried out in case of infection. They can fistulize towards the umbilicus or the bladder, or rupture in the peritoneal cavity. Diagnosis is based on ultrasound and CT scan.

Treatment often requires an initial stage of drainage followed by surgical excision of the urachus due to the risk of malignant degeneration.

A 4-year-old boy with no particular pathological history presented with a tender, midline, infra umbilical mass, and purulent umbilical discharge.

Clinically, the patient presents a fever with a swelling red abscess of the navel.

Ultrasound abdominopelvic objectives a collection of umbilical and anechogenic supravesical.

The child undergoes a surgical treatment involving the evacuation of the collection purulent with excision of the cyst. Postoperative recovery was uneventful.

The urachal cyst is a rare benign pathology. It remains asymptomatic for a long time and can be discovered at the opportunity of umbilical discharge, or swelling with or without infectious signs.

The most frequent complication is an infection, and its malignant transformation is to be feared Ultrasound plays a crucial role in making the diagnosis

The urachal cyst is sometimes only mentioned intraoperatively and is confirmed by histology

Keywords – Urachus, Umbilicus, Collection, Benign, Complication

Inhibitory potential of *Cicer arietinum* derived phytochemicals with alpha-amylase as a target receptor in type-2 diabetes mellitus

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Abstract – Diabetes mellitus (DM) constitutes a cluster of metabolic disorders posing significant health risks, including fatality, while conventional treatments often entail adverse effects. Hence, there's burgeoning interest in exploring novel antidiabetic medications with minimal side effects, with natural products emerging as a promising avenue. *Cicer arietinum* (commonly known as chickpea), a medicinal plant abundant in phytochemicals with therapeutic attributes, is under scrutiny in this study to gauge its potential as an antidiabetic agent. The *in vitro* assessment of *C. arietinum* (IC_{50} 100.2 ± 5 μg/mL) showcased a potent inhibitory effect on α-amylase (IC_{50} 55.08 ± 5 μg/mL), surpassing acarbose (IC_{50} 196.3 ± 10 μg/mL), the benchmark treatment. Further exploration into its mechanism entailed computational screening of 100 plant-derived phytochemicals, followed by molecular docking with α-amylase as the receptor protein. Among these compounds, medicagol, euphol, stigmasterol, beta-sitosterol, and fucosterol exhibited superior binding energy and engaged specific amino acids in the receptor molecule. However, only medicagol adhered to safety standards for potential drug candidacy based on ADMET properties and pharmacological analysis, while others fell short on one or more criteria. Consequently, medicagol emerges as a prospective diabetes treatment, showcasing bioactive attributes that position it as a lead compound for further drug development within the diabetes research domain..

Keywords – Medicinal Plant; Molecular Docking; Binding Energy; ADMET; Medicagol

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Quantifying Conductive Heat Flux Magnitude at TIG Welding Electrodes under Continuous Direct Current

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*Abstract –*This study addresses the challenge of accurately quantifying the magnitude of conductive heat flux experienced by electrodes during Tungsten Inert Gas (TIG) welding under continuous direct current (DC). The complex interplay of welding parameters, electrode characteristics, and heat transfer mechanisms poses a significant problem in understanding and optimizing the welding process. Leveraging the computational capabilities of COMSOL Multiphysics, we simulate the heat distribution and flux at the electrode interface, considering variations in welding conditions and electrode geometries. The results reveal insights into the spatial and temporal distribution of heat flux, shedding light on the underlying physics governing electrode performance and durability in TIG welding under continuous direct current.

Keywords –TIG Welding, Direct Current, Conductive Heat Flux, Electrode, COMSOL Multiphysics, Simulation, Optimization, Heat Transfer, Welding Parameters

Investigating Volumetric Loss Density and Electromagnetic Effects on TIG Welding Electrodes under Continuous Direct Current

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*Abstract–*This study addresses the challenges associated with volumetric loss density and electromagnetic effects experienced by electrodes during Tungsten Inert Gas (TIG) welding under continuous direct current (DC). The phenomenon of volumetric loss density and electromagnetic interactions poses significant problems in understanding and optimizing the welding process, particularly in terms of electrode erosion and stability. Utilizing the computational capabilities of COMSOL Multiphysics, we simulate the electromagnetic field distribution and volumetric loss density within the electrode, considering variations in welding parameters and electrode geometries. The results provide valuable insights into the spatial and temporal distribution of volumetric loss density and electromagnetic effects, offering a deeper understanding of their impact on electrode performance and durability in TIG welding under continuous direct current.

Keywords –Volumetric Loss Density, Electromagnetic Effects, TIG Welding, Direct Current, Electrode Erosion, COMSOL Multiphysics, Simulation, Optimization, Welding Parameters.

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Fruit phenotypic diversity in *Chamaerops humilis* L. (Arecaceae), in semi arid and sub-humid regions of Morocco

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Abstract – The aim of this work is to determine the phenotypic variability of fruits of *Chamaerops humilis* L. (Arecaceae) according to the climatic conditions. Three hundred accessions were sampled from three climatically different regions of Northern Morocco: Sefrou, Fez, and El Hajeb. They were examined, in order to evaluate the morphological variability of *Chamaerops humilis* L. fruits and identify its morphotypes, in order to ensure a better valuation of the species and to maintain its sustainable development. Nine characters have been examined, including five quantitative characters and four qualitative. Comparison of means tests and principal component analysis were used to assess the variation in the morphological characters of *Chamaerops humilis* L. fruits based on the regions. Hierarchical clustering was performed to identify *Chamaerops humilis* L. morphotypes. There was variabil ity in *Chamaerops humilis* L.fruit morphological characters in the three regions studied. The results revealed a great variation between individuals for the majority of the studied populations. The data collected from the field showed that the population originating from El hajeb presents fruits of large size, weight and shape that varied between oval and round-oblong, with an orange-brown color at maturity. On the other hand, the populations originating from the regions of Fez and Sefrou are characterized by less developed fruits, with smaller size, and a color gen erally red-brown and sometimes brown concerning the mature fruits.

Keywords – Chamaerops Humilis L., Fruits, Morphological Variability, Climatic Conditions, Morocco

Sustainable Brick Production from Stone Quarry Waste: Environmental Solutions and Performance Evaluation

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Abstract – This study explores the utilization of stone quarry waste in the production of bricks, aiming to address the environmental issue of waste accumulation. Various proportions of stone quarry waste were incorporated into brick manufacturing, and a series of tests were conducted to evaluate the properties and environmental impact of the resulting bricks. The study demonstrates that bricks made from stone quarry waste effectively mitigate the environmental problem associated with waste accumulation, while maintaining satisfactory structural and performance characteristics. Through rigorous testing, including assessments of strength, durability, and environmental impact, the study underscores the viability of using stone quarry waste in brick production as a sustainable solution to waste management challenges.

Keywords – Brick, Sustainable, quarry waste, characteristics, environmental.

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Energy management of an electric vehicle with a hybrid storage system: Battery/super capacitor

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Abstract – Greenhouse gas emissions are a major challenge for our planet, and the automotive industry is the main cause. To mitigate this impact, it is imperative to promote a more sustainable use of vehicles. In this context, electric vehicles are emerging as a promising solution, powered by electric batteries. However, their range poses a major challenge to the widespread adoption of this technology. To overcome this limitation, the hybridization of two sources of electrical energy - batteries and supercapacitors. This approach offers complementary advantages: batteries provide a primary energy source with high energy density, suitable for long-term storage, while supercapacitors act as a secondary energy source, offering high power with fast charging and discharging, responding effectively to instantaneous needs such as regenerative braking. In this study, we present the hybridization technology of batteries and supercapacitors, along with a detailed analysis of the energy management of this hybridization to power the drive train of a hybrid electric vehicle. We use Matlab/Simulink software to carry out simulations and optimize the performance of this system.

Keywords – Electric Vehicle, Energy Management, Storage, Battery., Super Capacitor.

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Exploring Novel 2H-1,5-Benzodiazepine: Synthesis, Crystal structures and Hirshfeld Surface Analysis

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Abstract – The family of heterocyclic compounds is currently experiencing significant expansion, both theoretically and practically. Among these compounds, benzodiazepines (BZD) hold a prominent position due to their diverse applications and biological activities. The synthesis of novel benzodiazepine derivatives and the evaluation of their biological potential for therapeutic purposes have seen substantial growth over the decades.

In this study, a new series of 1.5 benzodiazepine compounds were synthesized and characterized. The first compound has the structure 3-(4-(4-chlorophenyl)-2,3,4,5-tetrahydro-1H-benzo[b][1,5]diazepin-2-yl)-4-hydroxy-6-methyl-2H-pyran-2-one (I), while the second compound has the structure (R)-4-hydroxy-6-methyl-3-(2-phenyl-2,3-dihydro-1H-benzo[b][1,5]diazepin-4-yl)-2H-pyran-2-one (II).

Both compounds were characterized using techniques such as FTIR spectroscopy, UV-Vis spectroscopy, and single-crystal X-ray diffraction. In the crystal structures of compounds, intermolecular hydrogen bonds, halogen bonds π-π stacking interactions and C-H-π interactions contribute to the stabilization of the molecular assembly. Hirshfeld surface analysis was employed to quantify these molecular interactions, highlighting the significant contribution of hydrogen bonding to the overall crystal organization.

Additionally, in vitro biological assays demonstrated promising antioxidant activities for both compounds. These findings underscore the potential therapeutic relevance of these novel benzodiazepine derivatives, further supporting their exploration in drug discovery efforts.

Keywords – Heterocyclic Compounds, 1, 5-Benzodiazepines, X-Ray Crystallography, Hirshfeld Surface

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Machine Learning-Based Modeling of Active Molecules on HL-60 Leukemia Cell Line Using a Random Forest Model

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Abstract – Developing effective molecules for cancer treatment is a formidable task due to the intricate nature of biological systems. This research conducts a thorough examination of data from the HL-60 Leukemia cell line, comprising 9501 measurements, with a specific focus on Half-maximal inhibitory concentration (IC50) values sourced from online databases. Through meticulous data cleaning and normalization to nanomolar (nM) units, a refined dataset was obtained. By employing tailored classification techniques, valuable insights into compound activity levels were revealed. Leveraging molecular descriptors and feature selection, a predictive model was constructed using the RandomForestClassifier algorithm, achieving a commendable accuracy rate of 70%. This analysis provides valuable insights into compound potency and chemical attributes, which are essential for the drug discovery process.

Keywords – HL-60, Leukemia cell-line, Machine Learning, Random Forest, Python.

Exploration of Structural Stability, Electronic, Magnetic, Thermoelectric, Optical, and Thermodynamic Properties in half-Heusler compound MnFeIn

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Abstract – Ab initio calculations were employed using the full potential linearized augmented plane wave method to explore the characteristics of half-Heusler compound MnFeIn, utilizing the generalized gradient approximation. Through lattice equilibrium optimization, the stable magnetic phases of these systems were identified, predominantly exhibiting ferrimagnetic behavior. The systems largely complied with the Slater-Pauling rule condition for half-metallicity of alloys M_{tot}= ZV-24. Optoelectronic properties were assessed using optical parameters, confirming semiconducting behavior, with minimal optical reflections and significant absorption observed in the infrared and visible spectra, indicating potential for optoelectronic applications. Furthermore, a comprehensive evaluation of the thermodynamic properties was conducted to examine stability under varying temperature and pressure conditions, while analysis of transport properties revealed poor thermoelectric performance across this alloy.

Keywords – Mnfein; Structural, Electronic, Lattice Dynamics, Optical, And Thermodynamic Properties; DFT; FPLAPW; GGA

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Improved Electrochemical Performance of Lithium oxide perovskite as a Cathode Material for Li-Ion Batteries

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Abstract – This study explores the structural, electronic, lattice dynamics, optical, and thermodynamic properties of Lithium oxide perovskite (LOP) using a combination of density functional theory and thermodynamic calculations, employing the GGA-PBE and TB-mBJ methods. The dielectric function, absorption coefficient, extinction coefficient, and real and imaginary parts are analyzed across various frequencies. Entropy variation with temperature is presented under different pressures. The average equilibrium voltage of a LOP battery over a complete cycle is calculated to be near 5V, with an energy density of 800 Wh/kg. Considering all these properties, LOP emerges as a promising candidate for use as a cathode material in lithium batteries.

Keywords – Lithium Batteries; Structural, Electronic, Lattice Dynamics, Optical, And Thermodynamic Properties; DFT; V_{cell}

Study of magnetic properties of nano-graphene monolayer structure by Monte Carlo study

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Abstract – The magnetic and magnetocaloric properties of a nano-graphene monolayer structure, composed of a mixed spins $S= 3$ and $\sigma= 1/2$, are investigated using Monte Carlo simulations. We begin by analyzing the ground state phase diagrams across various physical parameters. The total magnetizations, partial magnetizations, and magnetic susceptibilities are determined as a function of the number of lattice sites. We derive the reduced critical temperature and examine the influence of exchange interaction, external magnetic fields, and crystal field on total magnetizations. Magnetic hysteresis cycles are observed, and we assess specific heat changes and magnetic entropy changes under various magnetic fields. Finally, we evaluate the relative cooling power of the system.

Keywords – Nano-Graphene Monolayer Structure; Monte Carlo Simulations; Mixed Spins; Interactions

Unlocking the therapeutic potential of GDF11 devised peptides using *in silico* approaches against liver fibrosis

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Abstract – Liver fibrosis is the excessive accumulation of extracellular matrix proteins including collagen that occurs in most chronic liver diseases. Advanced liver fibrosis results in cirrhosis, liver failure, and portal hypertension and often requires liver transplantation. The growth differentiation factor 11 (GDF11), also known as the bone morphogenetic protein 11 (BMP 11), has been found to play a key role in many biological processes, including embryonic development, metabolic disorders, and cancers. GDF11 has also emerged as a critical component in liver development, injury, and fibrosis. In this study, the amino acid sequence of the mature GDF11 protein was retrieved from NCBI's Entrez Protein database and cut into peptides using an online tool peptide cutter. The peptides devised from mature GDF11 were evaluated for their drug-likeliness scores and *in silico* anti-liver fibrosis activity. Two proteins were selected as target or receptor proteins which are involved in liver fibrosis. The three dimensional structures of human TGF-beta type I receptor (with PDB ID 1VJY) and vascular endothelial growth factor receptor 2 (VEGFR2) (with PDB ID 1YWN) were downloaded from protein databank. The receptor proteins were docked with GDF11 peptides. The peptide TVDFEAFGWD showed a stronger binding interaction with human TGF-beta type I receptor compared to VEGFR2 receptor of the liver fibrosis. The drug-likeliness score of –8.1 of the peptide TVDFEAFGWD also revealed its potential as a lead compound which could be used against liver fibrosis.

Keywords – BMP11; Molecular Docking; Binding Energy; Druggability; Peptides

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Numerical simulation of solar cell based copper-doped lead-halide perovskites using SCAPS simulator

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Abstract – This study is carried out to improve the lead iodide perovskite solar cell (PCS) performance, doping by the copper element (Cu). Therefore, the use of this promising active layer is a step to make the PCS in real competition with the others in the markets. whereas the main problems contributing to the non-commercialization of perovskite, are the stability in the air and the toxicity of lead. To overcome these, we use co-dopant, by the substitution of Pb with a lower portion of Cu to enhance stability and reduce toxicity, which has been realized in rare simulation literary works. Therefore, an investigation of the performance of PSC, by the one-dimensional SCAPS-1D numerical simulator model, has been done. The validation of the present work was made by comparing the current density characteristics (J-V), and quantum efficiency (EQ), with previous experimental work. the enhancement of the performance parameters has been achieved by the testing of the different hole transport layers (HTL): $Spiro - OMeTAD, CuSN, Cu_2O$ and CuI. In addition to the analysis of the effect of some physical parameters of the absorber layer, such as the defect density (N_t), thickness (d), radiative recombination coefficient (B_{rad}), doping concentration $(N_A \text{ and } N_D)$, series (R_s), and shunt (R_{sh}) resistance.

Keywords – Perovskite, SCAPS, HTL, Simulation.

Investigating the (3+1)-Dimensional Double Sine-Gordon Equation: Fresh Insights into Solutions and Intricate Wave Patterns

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Abstract – The (3+1)-dimensional double sine-Gordon equation is pivotal in understanding various physical phenomena, from nonlinear wave propagation to condensed matter physics. However, exact solutions for this equation pose considerable challenges. This study employs a generalized exp(-$\phi(\xi)$)-expansion and generalized Kudryashov methods to overcome these challenges and develop novel analytical solutions. These solutions, categorized into trigonometric, hyperbolic, exponential, and rational forms, unveil a diverse range of soliton solutions, including bright, dark, singular, periodic, and mixed types. The investigation uncovers previously unexplored complex wave structures, showcasing the equation's capacity to model intricate wave behaviors. Moreover, the efficacy of these methods in handling higher-dimensional nonlinear partial differential equations is demonstrated, thus broadening their utility in mathematical physics with increased flexibility and solution diversity compared to traditional techniques.

Keywords – (3 + 1)-Dimensional Double Sine-Gordon Equation, Solitons Solutions, Generalized $exp\left(-\phi(\xi)\right)$-Expansion Method, Generalized Kudryashov Method.

A variable speed electric drive based on a permanent magnet synchronous motor (PMSM)

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Abstract – This study concerns the electrical drive of a permanent magnet synchronous motor at variable speed. Synchronous motors with permanent magnets are becoming increasingly prevalent in mechanisms due to their superior performance compared to other alternating current motors. Among the numerous control methods developed in the literature, The general objective of our study is to investigate the structure of vector control applied to the PMSM, with a focus on the classic PI (current and speed) regulators. This approach allows for the achievement of notable performance gains, particularly in terms of the system's dynamic response, which is comparable to that of a DC motor.

Keywords – Permanent Magnet Synchronous Motor, Vector Control, Modeling, Proportional Integral Regulator, Matlab.

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Advancements in Feature Extraction Techniques for Medical Image Analysis

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Abstract – Medical image analysis plays a pivotal role in modern healthcare, aiding clinicians in diagnosis, treatment planning, and patient management. A crucial step in this process is feature extraction, where relevant information is extracted from medical images to characterize anatomical structures, lesions, or abnormalities. This presentation will provide insights into recent advancements in feature extraction techniques tailored for medical image analysis.

We have explored various feature extraction methods, including traditional approaches such as intensity-based features, texture analysis, and shape descriptors, as well as state-of-the-art techniques like deep learning-based feature extraction using convolutional neural networks (CNNs). These methods enable the extraction of discriminative features from medical images, facilitating tasks such as segmentation, classification, and quantification. Furthermore, we have discussed the challenges associated with feature extraction in medical image analysis, such as variability in imaging modalities, anatomical variations, and data heterogeneity. Strategies to address these challenges, including data augmentation, transfer learning, and domain adaptation, are highlighted.

We have demonstrated the efficacy of feature extraction techniques in various clinical applications using examples from diverse medical imaging modalities, such as MRI, CT, ultrasound, and PET. Additionally, we have discussed the integration of feature extraction methods into clinical workflows and their impact on improving diagnostic accuracy and patient outcomes.

Keywords – Feature Extraction, Medical Image Analysis, Healthcare.

The pseudo-spectrum and numerical range of Lorentzian metric g₃ on Heisenberg group H₃ of dimension three.

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Abstract : The study of eigenvalues and numerical range appears in diffrent scientific fields. We can cite for example the domain of physics, spectral theory, the stability of dynamic electricity, the quantum mechanics.

M. M. Khorami, F. Ershad and B. Yousefi published an article entitled "On the Numerical Range of some Bounded Operators". In this article, They gave conditions under which the numerical range of a weighted composition operator, acting on a Hilbert space, contains zero as an interoir point and they investigated exterme points of the numerical range of an operator acting on an arbitrary Banach space.

In our work, we find numerical range of left invariant Lorentzian metric g_3 on the Heisenberg group H₃ of dimension three. This metric g₃ is explicitly given by

$$g_3 = dx^2 + \left(xdy + dz\right)^2 - \left((1-x)dy - dz\right)^2, \ x \in \Box \ .$$

The matrices associated to the metrics g₃, is given by*:*

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 2x-1 & 1 \\ 0 & 1 & 0 \end{pmatrix}.$$

Keywords : Bounded Operators, Pseudo-Spectrum, Numerical Range , Heisenberg Group, Lorentzian Metric.

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Enhancing Sustainability in Concrete Construction: A Novel Approach by using virgin cork and limestone

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Abstract – The construction sector's heavy reliance on concrete raises environmental concerns, from emissions to resource depletion. To tackle this, researchers are exploring new materials and methods. Our lab has been experimenting with bio-based concrete, substituting traditional aggregates with virgin cork to enhance insulation. We further investigated by adding limestone to improve durability and mechanical properties.

Six concrete mixes were tested, including standard, dry and wet cork, limestone, and cork with limestone concrete. While cork reduced strength compared to standard concrete, limestone offset this, even enhancing strength in some cases. Porosity and absorption decreased with limestone, indicating better durability. The diffusion coefficient for chloride ions improved with limestone, especially in blends with wet cork.

The blend of dry cork with limestone showed the best mechanical properties, reduced porosity, and resistance to chloride penetration. Wet cork with limestone exhibited superior resistance to chloride diffusion, suggesting longevity in corrosive environments.

Future research will optimize wet cork concrete for durability and sustainability. Scaling up production of these bio-based materials could significantly reduce the construction industry's environmental impact while ensuring infrastructure longevity.

In conclusion, our study highlights the importance of material innovation for sustainable construction. By integrating bio-based materials like cork with traditional additives such as limestone, we can create more ecofriendly and resilient infrastructure solutions.

Keywords: Bio-Based Concrete, Virgin Cork, Limestone, Diffusion Coefficient, Durability.

Perception of Female Media Graduates on Choosing Media as their Career

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Abstract – The current study explored the perceptions of female media students about their career choices within the media industry. The study conducted under the light of "Social Cognitive Theory" that how female learning occurs in a social context with a dynamic and reciprocal interaction with the persons, working environment and their behavior in media organization. Through quantitative research methods, researchers tried to investigate that how factors such as opportunities, stereotypes, satisfaction, working system and representation influence decision-making processes of female while choosing their career. By examining their perspectives, study shed light on the challenges and barriers faced by aspiring female media professionals. Respondents (n=100) media graduated students were selected as sample using the technique of purposive sampling. To collect the data, self-designed questionnaire (on Google form) consisted on close-ended questions was design and distributed among the target public via WhatsApp. Results of the study revealed that majority of the female found interested to do job in the electronic media. However, job security, handsome salary, working hours, promotion, increments, gender equality found main factor of job elements. The study contributed to the promotion of gender equality and diversity within the media industry by informing educational institutions, media organizations, and policymakers about the necessary steps to create more inclusive and supportive environments.

Keywords – Media Industry, Career, Media Students, Perception, Job Factors

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Study of rapid solidification with consideration of undercooling during the flattening of droplets on a substrate in coating formation

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Abstract – The thermal coating process entails the quick solidification of molten droplets onto the substrate. A model is devised to elucidate this phenomenon, considering various parameters including undercooling, nucleation, and interface tracking. This model is based on literature data concerning stagnant splats. Using this model, the characteristics of solidification interface for non-stagnant splats are examined, highlighting the influence of undercooling and heat transfer coefficients. Non-stagnant splats manifest distinct features in their interface, ascribed to phenomena such as droplet thinning and recoil during propagation.

Keywords – Solidification, Droplet Impact, Abaqus Cae, Heat Transfer

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Analytical Solutions of Functionally Graded Nano-Plate Content Consisting of Metal and Ceramics with Porosity

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Abstract – This paper introduces the analytical solutions of complex behavior analysis utilizing high-order shear deformation plate theory of functionally graded FGM nano-plate content consisting of a mixture of metal and ceramics with porosity. To incorporate the small-scale effect, the non-local principle of elasticity is used. The impact of variance of material properties such as thickness-length ratio, aspect ratio, power-law exponent and porosity factor on natural frequencies of FG nano-plate is examined. Current solutions of the dimensionless frequency are compared with those of the finite element method. The effect of geometry, material variations of nonlocal FG nano-plates and the porosity factor on their natural frequencies are investigated in this review.

Keywords – FG; Nano-Plate; Non-Local Theory; Metal And Ceramics; Porosity.

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Evaluation of extraction methods of C-phycocyanin from Spirulina platensis

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Abstract – Cyanobacteria, also known as blue green algae are a class of gram-negative bacteria, which are considered to be the oldest form of life on the earth. They possess a wide range of coloured components, including carotenoids, chlorophyll and phycobiliproteins. Phycobiliproteins (PBPs) are large water soluble supramolecular protein aggregates involved in light harvesting in these organisms and may comprise as much as 40–60 % of the total soluble protein in these cells .The PBPs, mainly phycocyanin have been widely used as nutritional ingredients, natural dyes, florescent markers, pharmaceuticals such as antioxidants and anti-inflammatory reagents. Phycocyanin is used as colorant in food and cosmetics. It has also shown to have therapeutic value (immuno-modulating activity and anticancer activity) Phycocyanin is the most important natural blue pigment used in the food and biotechnology because of their colour, fluorescence and antioxidant properties. Cyanobacteria, as a source of PC are being exploited for a long time. But most studies have focussed on production and purification of PC from Spirulina platensis.
Spiruline sp was obtenue a partir centre de culture, the Culture was maintained in chemically defined Medium(Zarrouk 1966) at 35 ± 2 C and light/dark cycles of 16:8 h.there are several methods of etraxction of phycocyanin, in this work we used two methods: Sonification extraction and Solvent extraction.using the phosphate buffer, The phycocyanin concentration of dry spirulina varies between 0.06-0.39 mg/ml. the results given would give it its indicative value for possible applications, mainly in cosmetics.

Keywords – Spirulina, Phycocyanin, Extraction, Purity, Antioxidant

The durability of earth bricks

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*Abstract –*The durability of earth bricks, particularly Compressed Stabilized Earth Bricks (CSEBs), is a crucial aspect in sustainable construction. Various studies have focused on enhancing the durability of earth bricks through different methods. Research has shown that incorporating cassava wastewater in CSEBs can lead to higher compressive strength and lower water absorption, demonstrating promising results for technical feasibility. Additionally, the use of lime-rich binders in earth bricks has been found to improve resilience to wetting-drying cycles compared to cement stabilization, with lime-stabilized bricks showing increased strength after exposure to high temperatures. Lowering clay and silt content through washing has also been explored to optimize the durability of CSEBs, with findings indicating that a clay and silt range of 5% to 20% is ideal for achieving the desired properties. These findings collectively highlight the importance of material composition and stabilization methods in enhancing the durability of earth bricks.

Keywords –Earth Bricks, The Durability, Compressive Strength, Lime

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Experimental and theoretical computational studies, Hirshfield surface analysis calculation and NLO properties of new azo dye compound

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Abstract *–* In this paper, we report the azo dye known as (E)-1- [(2,4,6-tribromophenyl) diazinyl]-naphthalen-2-ol was thoroughly characterized through the application of spectroscopic techniques. Hirshfeld surface and 2D-fingerprint plots analysis shows that the H…H, O…H/H…O, C…H/H…C, N…H/H…N and Br…H /H…Br contacts are the most significant contributors, structural and molecular properties were further investigated. The energy gap (Eg), frontier orbital energies (E_{HOMO}, E_{LUMO}), and distinct reactivity parameters were computed using density functional theory with the B3LYP/6–311++G(d,p) level of theory, the dipole moment orientation was determined in order to understand the nature of inter and intramolecular charge transfer. In addition, calculations and discussions were conducted regarding electric properties like polarizability and hyperpolarizability in both static and dynamic regimes. The stabilization of the crystal is largely attributed to the presence of hydrogen bonds, as revealed by the Hirshfeld surface analysis. Additionally, this azo dye compound has a nonlinear optical aspect and shows less reactivity and greater stability in high polar solvents.

Keywords – Azo Dyes, DFT, NLO, Hirshfeld Surface Analysis, Energy Gap.

Isolation and screening soil fungi for biosurfactants production for for Environmental Application

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Abstract – Microbial surfactants, also known as biosurfactants, are valuable, surface-active and biologically efficient microbial amphiphilic molecules for various industries or process. Plants and animals produced biosurfactants, but microorganisms such as bacteria, yeasts and filamentous fungi produce a majority of them. Biosurfactants are not toxic, more effective and environmentfriendly because of their low toxicity, and in the fields of bioremediation and west treatment, they are also ecologically safe. Natural resource extraction and growing industrial activity have resulted in major environmental issues. As a result, more work is need to resolve environmental problems, petroleum and its associated products are the most widely used energy resources, and their transportation and usage frequently generate many sorts of pollution. Some microorganisms metabolic pathways can be create molecules capable of solubilizing hydrophobic substrates such as hydrocarbons, lipids, oils, and antibiotics . Biosurfactants are attractive candidates for bioremediation and In comparison to commercial surfactants, modest quantities of biosurfactants can be effective against contaminants without negative consequences. Over the previous five years, a literature review was undertaken, and 108 papers were examined Isolation and screening method for microorganisms produce a biosurfactant through a soil sample has been done in this study, incubation and purification methods were used then drop-collaps and emulsification (E^{24}%) test for screening fungal the fermentation process was used to produce the biosurfactants.

Keywords – Biosurfactants, Bioremediation, Microbial Surfactants, Microbial Surface-Active

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E-government Adopts Mathematical Modeling to Improve Work Applications

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Abstract – Implementing mathematical modeling in e-government can greatly enhance functionality and optimize the efficiency and effectiveness of public service delivery. Mathematical modeling is a method that employs mathematical equations and algorithms to depict and examine real-world systems. It can offer significant insights and aid decision-making in diverse fields. This paper examines the use of mathematical modeling in e-government and its ability to enhance the efficiency of work applications. Digital technology has rapidly revolutionized the operations and delivery of public services by governments. E-government has progressed beyond fundamental electronic service delivery to the incorporation of emergent technologies such as artificial intelligence, blockchain, and the Internet of Things. E-government 3.0, the latest phase of electronic government, has the potential to revolutionize the way public services are provided and governed by utilizing modern technologies. Mathematical modeling is a technique that can be used to enhance work applications in e-government. The integration of mathematical modeling in e-government can transform work applications and enhance the delivery of public services. Through the utilization of mathematical models, governments can improve effectiveness, make decisions based on data, optimize the allocation of resources, and reduce risks. Nevertheless, the effective integration of mathematical modeling in e-government necessitates cooperation among policymakers, data scientists, and domain specialists to guarantee precise model construction and efficient utilization.

Keywords: Mathematical Modeling, E-Government, Effectiveness, Public Service, Digital Technology.

The Role and Effectiveness of Augmented Reality Applications for Educational Curricula Through Distance Learning

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Abstract – It is essential to understand the difference between educational Augmented Reality (AR) Applications that target students and those aimed at adult learners. AR applications in education often serve as tools to engage and motivate learners toward specific topics. Adult learners are frequently directed to specific educational materials or have a defined learning objective. This distinction is evident in studies exploring the use of mobile AR systems for vocational training, which reorganize skill-based learning resources and provide a connected, location-specific educational experience. In contrast, younger learners may not be directly taught new materials but instead participate in an interactive educational experience. Educational AR applications for students often serve as supplementary tools to engage them in particular subjects, rather than teaching them entirely new content. AR is defined as an interface between virtual information and the real world. AR is a rapidly growing field with an increasing number of AR Applications being developed and researched. This is largely due to the development and widespread availability of mobile computing devices, this paper focuses on exploring the use of AR in education, specifically educational AR Applications and their role and effectiveness in curricula through distance learning.

Keyword: Augmented Reality, Educational, Distance Learning, Applications.

The Role and Impact of Digital Fields on Education and Educational Curricula through Augmented Reality Applications

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Abstract – The integration of mobile computing devices in the classroom supports teaching and learning. It reflects a modern and innovative vision for the future of education, aiming to enhance both teaching practices and student learning experiences. Various devices, such as smartphones, tablets, and laptops, are commonly used by most young people outside the classroom environment. The accessibility of these tools presents an opportunity to enhance the learning experience by incorporating them into the learning process. Although many students already bring such devices into the classroom, there have been limited attempts to utilize them effectively for learning purposes. This is particularly true for subjects beyond the realm of information technology. Each of these technologies has achieved varying levels of success in terms of integration within curricula

It's important not to confuse augmented reality with virtual reality (VR) technology. VR immerses users in a simulated world, whereas AR takes a partial immersion approach, enhancing the real world with simulated aspects. AR provides a novel way to deliver information in an engaging and interactive manner. In addition to traditional text and video learning resources, AR can be used to create virtual educational environments and provide contextually relevant information.

Keyword: Digital Fields, Educational Curricula, Augmented Reality, Virtual Reality, Virtual Educational Environment.

Study of the role of Strontium in tunning structural, electric, optical, and dielectric properties of Zinc Cobalt Spinel Ferrites

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Abstract – $Zn_{0.5}Co_{0.5}Sr_xFe_{2-x}O_4$ spinel ferrites with varying Sr^{+2} content (x = 0.00-0.08 having 0.02 difference) were synthesized using the coprecipitation technique. Multiple characterization methods, including Xray diffraction (XRD), scanning electron-microscopy (SEM), energy dispersive X-ray analysis (EDX), Fourier transform-infrared spectroscopy (FT-IR), UV-Visible spectroscopy, and dielectric analysis, were employed to comprehensively evaluate their structural, morphological, elemental, vibrational, optical, and dielectric properties. XRD analysis revealed a decrease in crystallite size from 20.9 nm to 10.4 nm and a reduction in lattice-constant ranging from 8.46 to 8.39 Å as the Sr^{+2} concentration increased. SEM images depicted a decrease in particle size and the formation of agglomerates with increasing strontium content. The presence of spinel ferrites was confirmed by sharp peaks at 430 cm^{-1} and 534 cm^{-1} in the FT-IR spectrum. UV-Vis spectroscopy indicated a decrease in optical-band gap from 3.02 to 2.21 eV with increasing doping content. Dielectric analysis showed a decreasing trend in both dielectric constant and dielectric loss due to doping. The AC conductivity exhibited an increasing trend with frequency, approaching greatest value of 0.33×10^{-7} [ohm cm]$^{-1}$ at higher frequencies. Moreover, the dielectric analysis revealed the material's frequency dependency, suggesting potential applications in microwave and frequency-dependent devices.

Keywords: Co-Precipitation Technique, Dielectric Analysis, Agglomerates, AC Conductivity,

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Study of the magnetic and electronic properties of Fe-Doped ZnO

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***Abstract** –* Doping ZnO with appropriate elements can enhance its optical characteristics and accelerate the race for practical applications. In particular, doping ZnO with iron significantly alters its physical properties. Using density functional theory, a predictive study of the electronic and magnetic properties of ZnO doped with different concentrations and configurations of iron positions is possible.

Calculations based on DFT were performed to investigate the structural, electronic, and magnetic mechanisms of the $Zn_{1-x}Fe_xO$ alloy with various concentrations (25%, 50%, and 75%), as presented in this work.

"In our study, we applied the ab-initio calculation code WIEN2k, based on Density Functional Theory (DFT), using the full-potential linearized augmented plane wave (FP-LAPW) method to investigate the electronic and magnetic properties of the Zn1-xFeXO alloy. We employed the TB-mBJ, GGA, GGA+U, and GGA+U+TB-mBJ approximations.

It was found that GGA+U, compared to GGA, provides a closer evaluation of the 3d states energies of Zn and accurately estimates the bandgap value. Moreover, the substitution of Zn by Fe significantly affects the electronic properties of pure ZnO, where we observed metallic character for different concentrations of $Zn_{1-x}Fe_xO$ compound using the GGA approximation, and semiconductor character for concentrations (0.50, 0.75), and half-metallic character for concentration (0.25) using the GGA+U+TB-mBJ approximation.

Keywords – ZnO, DFT, GGA+U, FP-LAPW, $Zn_{1-x}Fe_xO$

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Enhancing thermal conductivity in mortars: utilizing renewable fiber reinforcements for sustainable building materials

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Abstract – This study aims to enhance the utilization of local natural resources, which are renewable and suitable for building materials. Within this framework, we investigate the effect of integrating fibers sourced from local materials into mortar compositions, with a specific focus on their impact on thermal conductivity. Through this investigation, we aim to assess the potential of these renewable fibers as reinforcing agents in construction materials, with the overarching goal of improving sustainability and performance in building applications.

Our research delved into the influence of fibers on the thermal conductivity of mortars. Following a 192-hour drying period, we observed a reduction in thermal conductivity with an increase in fiber content. Notably, mortars reinforced with 4% Diss and Doum treated fibers exhibited respective reductions of 40% and 33% compared to the reference mortar. This decline is attributed to heightened porosity resulting from water absorption by the vegetable fibers. Moreover, an analysis based on water content affirmed the significant role of this parameter in influencing thermal conductivity.

Thermogravimetric analyses uncovered distinct peaks corresponding to the decomposition of the chemical constituents of the materials under study. The presence of vegetable fibers led to specific peaks associated with their thermal decomposition. Similarly, differential calorimetric analysis indicated discernible differences between the reinforced mortars and the control mortar, suggesting heat absorption in the reinforced composites.

Consequently, the incorporation of fiber reinforcements facilitates heat absorption by the composites, potentially bolstering the fire resistance of construction materials.

Keywords – Thermal Performance, Sustainable-Building Materials, Renewable Fibers, Eco-Friendly Material, Porosity.

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Effect of Antimony (Sb) Addition on Crystallization Kinetics and Thermal Stability of SeM (M=In, Zn) chalcogenide glasses

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Abstract – Chalcogenide glasses have a particular interest in the scientific community. There are materials with high importance in modern technology; they are obtained by mixing the chalcogen elements, viz, S, Se and Te, with elements of the periodic table such as Ga, In, Si, Ge, Sn, As, Sb, Bi, Ag, Cd, Zn, etc. a lot of work has been done on optical, electrical and thermal properties of chalcogenide glasses; they are widely used for many applications related to the use in digital X-ray imaging, xerography, optical recording, memory switching and electrographic applications such as photoreceptors in photocopying and laser printing.

The addition of third element in the SeM (M=In ,Zn) glasses converts the glasses into an interesting material and compound has a special effect on structural, optical, electronic and thermal properties. With this point of view Sb has been added to SeM (M=In ,Zn), which will create the compositional and configurational disorder in the material as compared to binary alloy.

In the present work we study the effect of addition of Antimony Sb content on various thermal parameters in binary SeIn and SeZn glassy systems. Bulk sample of the $Se_{90-x}M_{10}Sb_x$ (M= In, Zn) x= (0, 2, 4) chalcogenide glasses prepared by a conventional melt quenching technique was studied using the differential scanning calorimetry (DSC) measurement at different heating rates 5, 7, 10 and 12 C min-1. The crystallization and glass transition kinetics of $Se_{90-x}M_{10}Sb_x$ (M= In, Zn) chalcogenide glasses were studied under non-isothermal condition using a Differential Scanning Calorimeter (DSC). The activation energy of glass transition Eg, Avrami index n, dimensionality of growth m and activation energy of crystallization Ec have been determined from different models. Thermal stability has also been determined from the temperature difference betwen the onset crystallization and glass transition temperature.

Keywords – Chalcogenide glasses, DSC, Activation Energy, Thermal stability, Crystallisation, Glass Transition

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Modüler Tasarımın Mekânsal Esnekliğe Katkısı

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Özet – Mimarlık insanların yaşam alanlarını şekillendiren ve çevrelerindeki dünyayı etkileyen sanat ve bilim alanıdır. Mimarî ürünlerin uzun ömürlü olmaları nedeniyle zaman içerisinde insan, çevre ya da teknoloji faktörlü tüm değişikliklere uyum sağlaması beklenmektedir. Bu açıdan bakıldığında; değiştirilebilme, dönüştürülebilme özelliklerine sahip esnek mekânlar/binalar mimarlar tarafından bir çözüm yolu olarak görülmektedir. Farklı ihtiyaçlar için esnek mekân oluşturmanın farklı teknik ve yöntemleri vardır. Bunlardan biri de yapının farklı unsurlarını tekrarlanabilir, standart boyutlu parçalara bölerek veya birleştirerek yapıların kolaylıkla ölçeklenebilir, tekrarlanabilir ve değiştirilebilir olmasını sağlayan "modüler tasarım"dır. Tarih boyunca modüler tasarımın da farklı amaçlar için farklı yöntemlerle kullanıldığı görülmektedir.

Bu çalışmanın amacı, günümüzde modüler tasarımın geldiği durumu görmek, gelecekteki uygulamaları ile ilgili öngörülerde bulunmak ve mekânsal esneklik üzerindeki katkısını ortaya çıkartmaktır. Bunun için modüler tasarımın günümüzdeki kullanım amaç ve yöntemleri, teknoloji ile ilişkisi, mimaride kullanılan yapısal sınıflandırılması incelenmiş, sağladığı avantajlar sıralanmıştır. Ayrıca, mekânsal esnekliğin ihtiyaca göre sınıflandırılması yapılarak modüler tasarımın sağladığı avantajlarla bağlantısı kurulmuştur.

Mekânsal esneklik ihtiyacı; fonksiyonel, fiziksel, zamansal, kullanıcı odaklı, sosyal veya teknolojik değişimler nedeni ile ortaya çıkmaktadır. Modüler tasarım; standart boyutlar, tekrarlanabilirlik, uyarlanabilirlik özelliklerine sahip modüler bölmeler ve ayırma/birleştirme elemanları ile kullanıcı odaklı, hızlı, ekonomik ve sürdürülebilir yapılar inşa etmemizi sağlar. Modüler yapılar bu özellikleri ile esnek mekânların değişim ve dönüşüm ihtiyacını pratik, hızlı, ucuz ve kolay bir şekilde karşılayabilmektedir. Sonuç olarak, modüler binalar esnek mekanlar oluşturabilmek için kullanılabilecek en iyi yöntemlerden biri olarak görülmektedir.

Anahtar Kelimeler – Mimarî Tasarım, Esneklik, Mekânsal Esneklik, Modüler Tasarım

Development and Structural Analysis of Poly(ε-caprolactone) /Metal organic Framework Nanocomposites

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Abstract – Addressing the pressing environmental concerns linked to non-biodegradable plastic usage, particularly in packaging, has spurred a transition toward bio-based polymers. Integrating Metal-Organic Frameworks (MOFs) into biodegradable polymers like poly(ε-caprolactone) (PCL) holds promise in tackling these issues. This study delves into the structural impact of MOF on PCL, aiming to enhance its properties while minimizing environmental impact. By synthesizing MOF at room temperature and seamlessly incorporating it into molten PCL using a twin-screw extruder, the study explores the multidimensional effects through analyses including FTIR, XRD, AFM and contact angle measurement. FTIR analysis revealed subtle shifts in carbonyl group vibrations upon MOF addition, indicative of molecular interactions. XRD characterization showcased minimal alterations in PCL crystallinity, suggesting the maintenance of structural integrity post-incorporation of MOF. Water contact angle measurements demonstrated a decrease in hydrophobicity with increasing MOF concentration, underscoring potential applications in surface coatings. AFM analysis depicted an increase in surface roughness, corroborating the homogeneous dispersion of MOF within the PCL matrix. The findings highlight the potential of PCL/MOF nanocomposites to advance sustainable packaging materials with improved mechanical properties and customized surface characteristics. The uniform dispersion of MOF within the PCL matrix emerges as a hopeful strategy to combat plastic pollution, addressing pivotal environmental challenges associated with non-biodegradable plastics in packaging applications.

Keywords – Biodegradable Polymer, Metal Organic Framework, Nanocomposite, XRD, AFM.

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Corrosion protection of steel by extracting plantes

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Abstract – A number of researchers are investigating new inhibition methods to protect against metal corrosion using different, more environmentally-friendly extraction methods for plant compounds.

Our research is based on the effect of plant extracts by three green plant extracts "Ruta Graveolens, Cleome Arabica and Citrulus Colocynthis L." in acidic media. Most of these inhibitors are toxic or carcinogenic and harmful to the environment.

The use of inhibitors is one of the ways in which their mode of action in protecting steel against corrosion can be accurately assessed.

Keywords – Steel, Plants Extracts Corrosion, Corrosion Inhibitors,

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Cultural Tourism and the Enhancement of Architectural and Urban Heritage in Algeria

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Abstract – This research paper examines the interaction between cultural tourism and the enhancement of Algeria's architectural and urban heritage, assessing how the nation's historical and cultural assets can promote sustainable tourism. Algeria boasts diverse cultural landmarks, from Ottoman palaces and French colonial architecture to ancient Roman ruins, attracting tourists interested in historical preservation and educational experiences. The study reviews the current state of cultural tourism in Algeria, noting key historical sites and their use in tourism. It addresses the challenges and opportunities for preserving these sites amid urban development pressures and rising tourist numbers. The methodology combines qualitative and quantitative methods, including site visits, interviews with stakeholders (tourism professionals, officials, community leaders), and visitor data analysis. A key focus is adaptive reuse— repurposing historical buildings and areas for modern use while preserving their cultural integrity. The paper suggests frameworks that integrate heritage conservation with tourism development to boost the local economy and maintain cultural identity. Additionally, it explores digital technology's role in heritage tourism, such as augmented reality (AR), which enhances visitor engagement without affecting the physical site. In conclusion, the paper promotes a comprehensive approach to cultural tourism and heritage valorization in Algeria, involving multidisciplinary collaboration, sustainable practices, and community engagement. This strategy aims to enhance tourism and deepen the appreciation and understanding of Algeria's architectural and urban heritage.

Keywords – Cultural Tourism; Heritage Conservation; Architectural Preservation; Sustainable Development; Algerian Heritage Sites

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Provision of educational services based on the activity of local government in Kosovo

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Abstract – The evaluation includes all levels of education and the activities of schools that are the responsibility of the municipalities. It is the most extensive field of providing services to citizens, where significant resources and human resources are needed to ensure its operation. Educational institutions (EIs) represent the development industry of a country. In these institutions, knowledge is produced, which is capital or the most valuable asset of a society. In RK there are a total of 1,161 pre-university schools (418,352 students), of which: 42 preschools, 998 primary schools, 115 secondary schools and 6 special schools. Pristina has the largest number of schools, 80 schools, while Mamusha has the smallest number, 3 schools. Out of 34 municipalities, 9 municipalities have 0.0 kindergartens, 1 municipality has only one primary school, 1 municipality has only 2 primary schools and 8 municipalities have only 1 upper secondary school. This shows that 30% of the municipalities do not offer teaching and education for preschool children and do not exercise their legal competence, while 27% of them offer at least upper secondary education. The most important factor in the functioning of the educational system are HR, which are neither sufficiently trained nor licensed for the implementation of reforms in pre-university education. Thus, I will speak more broadly about the topic in question during the presentation of this paper.

Keywords – Municipal Services, Education, Activity, Legislation, Development.

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The provision of services provided by the municipality according to the legislation in force

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Abstract – The main function of the VQL system in Kosovo is oriented towards providing the highest quality services. The services create the connection between PL and citizens and at the same time, PL maintains the connection with PQ. For the provision of services, the local administration in Kosovo has engaged 6224 employees, who have medium-level capacities for fulfilling the requirements of interested parties21. Services are products that the municipality offers to its citizens based on the needs and requirements assessed and sanctioned by administrative and legal acts. Based on the analyzes and assessments made, the basic areas for which the citizens have a primary need for the municipality to provide services have been identified. The basic areas of service provision are related to the municipality's full right to provide these services (own competences). You can list the main basic areas of municipal services in the following table. Based on the assessment of the needs of citizens, different interest groups and communities, MLGA, through the legal framework and other administrative documents, has sanctioned the main areas in which municipalities offer services to citizens and interest groups. Municipal services are divided into three categories: Basic services; Outsourced Services and Specialized Services. Many European countries have moved to providing integrated services. Thus, we will talk more broadly about the provision of municipal services during the presentation of the paper.

Keywords – Municipality, Services, Legislation, Practice, Development.

Environmental protection and public and municipal services according to legislation in Kosovo

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Abstract – The municipalities of the Republic of Kosovo have a rich environment with forests and other natural green areas or as monocultures cultivated by man. The environment is relatively prosperous with clean water and air. The central and local levels have developed many strategic and legal regulatory documents for the protection and advancement of the living environment, but they are generally not implemented in the best way. Another group of public services are: water supply, sewerage, waste management, public transport, maintenance of roads and public spaces and public enterprises. These services are connected to the municipality through public enterprises, which are responsible for providing public and emergency services. Municipalities have significant problems in providing these services, because the status of public enterprises, which perform these services, is relatively independent from the municipality and the powers of a municipality are limited in their management. In the following, we are reflecting the data for each service. I will talk more about the topic in question during the presentation of this paper.

Keywords – Municipality, Environment, Public Services, Legislation, Rules.

The impact of building compactness on microclimate and resident comfort: a case study of the M'zab Valley in Algeria

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Abstract – Building compactness is a critical factor in urban environment studies, especially in arid regions like the M'zab Valley in Algeria. This article examines how construction density influences the local microclimate as well as the thermal and psychological comfort of residents. The M'zab Valley, known for its unique architecture adapted to desert climates, provides an ideal setting to explore these dynamics. The study employs a mixed-methodology approach, including microclimatic simulations using ENVI-met software, surveys on resident comfort, and direct measurements of ambient temperatures and comfort indices across various neighborhoods. The data show that high-density areas, characterized by narrow streets and closely spaced buildings, exhibit lower nighttime temperatures compared to less dense areas, suggesting a moderating effect on the extreme temperatures typical of desert climates. However, compactness can also pose challenges, such as reduced ventilation, which can increase heat sensation during the day. Residents in densely built areas report lower comfort levels during peak heat periods, highlighting the importance of planning that balances density and open spaces to allow adequate air circulation. The article concludes on the need to consider building compactness in urban planning policies, especially in arid regions. A better understanding of its impact on microclimate and resident comfort can lead to more adaptive urban designs that improve life quality while respecting environmental constraints specific to each region. Specific recommendations for urban planners in the M'zab Valley are proposed, aiming to optimize building compactness to enhance residential comfort while minimizing negative impacts on the local microclimate.

Keywords – Building Compactness; Urban Microclimate; Thermal Comfort; M'zab Valley; Arid Climate Urban Planning

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Environmental protection and public and municipal services according to legislation in Kosovo

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Abstract – Thus, any action against life and human being is sanctioned according to the penal code of Kosovo and in case the same is proven, the perpetrator must suffer the punishment determined by the said Code. Thus, based on the weight of the criminal offense committed, the sanction for the perpetrator of the criminal offense is determined. Thus, based on the Criminal Code, it is emphasized that: The provision of criminal offenses as well as the types of measures and the level of criminal sanctions for perpetrators of criminal offenses are based on the necessity of the criminal legal sanction and the proportionality of the degree and nature of the danger to human freedoms and rights and of social values.

Therefore, the offense committed must first be identified, which for the jurors is the basis for proceeding further with court proceedings, and then in court proceedings based on the evidence and the Criminal Code of Kosovo, the judge determines the criminal sanction for that offense performed. In order to protect freedom and human rights, rules are defined in the legislation of a state. Likewise, according to the legislation in Kosovo, basic human rights and freedoms are protected both by the constitution and by civil and other criminal laws. Thus, the initial

approach is found in the penal code of Kosovo, according to which in its first provisions it is emphasized that: Criminal offenses and criminal sanctions are provided only for those behaviors that infringe or damage to that extent human freedoms and rights as well as other rights and social values guaranteed and protected by the Constitution of the Republic of Kosovo and by international law, the protection of which would not be possible without criminal and legal violence. I will talk more about the paper during its presentation at the conference

Keywords – Sanction, Intent, Criminal Offense, Law, Criminal Code.

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Mediation procedure as an alternative procedure for dispute resolution

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Abstract – In recent years, for the settlement of civil disputes or other matters, the mediation procedure is used a lot. This procedure is used based on the law on mediation, based on which the provisions are defined that show how to conduct a mediation procedure. The mediation procedure can be requested by the parties themselves, and also by the court as an instruction for the parties who have already started the procedure before the basic court. In most cases, the mediation procedures were successful in resolving disputes, thus creating the possibility for the parties to create an agreement or bargain between them, from which they resolved the dispute. In addition to negotiation, the mediation procedure ends the judicial procedure in a faster and less expensive way, since the parties in the mediation procedure have only agreed on how to come to the solution of the disagreement more easily. Thus, the mediation procedure can be used for civil, commercial, labor law, financial cases, and also for criminal offenses that are not punishable by more than 3 years of imprisonment. Thus, the mediation procedure continues to be the most requested and applied procedure by the parties who want to resolve their dispute by agreement. Thus, I will speak more broadly about the mediation procedure during the presentation of the paper.

Keywords – Procedure, Mediation, Legislation, Practice, Development.

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Conditions and principles of execution of foreign court decisions according to LPDNK

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Abstract – The procedures with special emphasis and the decisions taken by foreign international courts have the same force in the territory of the Republic of Kosovo as the decisions taken by the courts of Kosovo. Thus, based on the Law on international law in Kosovo, it is emphasized that: the conditions for the recognition and execution of foreign judicial decisions by the competent Court of the Republic of Kosovo are the same, with the exception of the principle of reciprocity, which applies as a condition, only for the execution of foreign court decisions. Thus, in all cases in which the implementation of the decision is required by a foreign court, the same is used without any problem in the courts and bodies of Kosovo, this is due to the fact that such a thing is allowed by the law in question. In these cases, we have the principle of reciprocity based on which some exceptions are made when it comes to the execution of foreign court decisions. Such a thing is determined by the law of private international law in Kosovo, according to which it is stated that: the condition of the principle of reciprocity according to paragraph 1 of this article is excluded in those cases when one of the parties is a citizen of the Republic of Kosovo, or has a residence or habitual residence in the Republic of Kosovo. Thus, I will speak more broadly about the topic in question during the presentation of this paper.

Keywords – Conditions, Principles, Execution, Decisions, International Law.

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Financing of local government based on Kosovo legislation

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Abstract – The law has defined the rights of a strong autonomy in the management of the local finances of the Municipalities. These rights are broken down and specified by the special law on Local Government Finances. Municipalities have the right to decide, assign, collect and spend their own revenues as well as receive funds from the Government. The legal framework creates the right for municipalities to enter into inter-municipal and cross-border cooperation, but without the right to form a second or intermediate level. The municipality has been enabled to enter into cooperation with other municipalities in the function of faster local economic development, efficiency and effectiveness of providing services to citizens and various interest groups. The right to cooperation at the local level, both in the inter-municipal national and international municipal aspects, as well as the right to form and join associations, is one of the rights and principles promoted and guaranteed by the Charter (KEVL). 9 It is important that a municipality can mandate another municipality to exercise an independent competence that it does not have the capacity to exercise on its own. Meanwhile, the international municipal cooperation is limited only in the administrative and technical aspect, with the exception of the Serbian community, which has the right to cooperate with Serbia in important state fields. International practices speak of unlimited rights of international cooperation of municipalities for the powers they have defined by law. We will talk more broadly about the topic in question during the presentation of this paper.

Keywords – Legislation, Practice, Local Self-Government, Financing, Bodies.

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Geometric Characteristics and Natural Lighting in the Courtyards of Administrative Buildings in Arid Regions A Case Study of the City of Biskra

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Abstract – This research investigates the impact of geometric characteristics on the natural lighting within the courtyards of administrative buildings in arid regions, focusing specifically on the city of Biskra. The primary objective of the study was to determine how different geometric configurations of courtyards influence their illumination, which is crucial for energy efficiency and occupant comfort in harsh climates. The methodology employed involves the utilization of Ecotect software, a tool renowned for its precision in simulating and analyzing environmental performance, including natural lighting. The study systematically varied courtyard geometries in simulated models to observe changes in light levels throughout the day and across different seasons. Initial findings suggest that specific geometric modifications to courtyard shapes and proportions can significantly enhance natural light penetration, thus reducing the reliance on artificial lighting and contributing to energy savings. The simulations also helped identify optimal configurations that maximize light availability while minimizing heat gain, which is particularly beneficial for buildings in arid climates like Biskra. This research contributes to sustainable architectural practices by providing empirical data and practical recommendations on the design of courtyards in administrative buildings situated in arid regions. The findings advocate for a tailored architectural approach that considers both the functional and environmental aspects of building design, emphasizing the role of simulation tools like Ecotect in achieving energy-efficient and occupant-friendly spaces. The paper concludes with a discussion on the implications of these findings for architects and urban planners, suggesting further areas of research that could explore the integration of other sustainable elements such as vegetation and water features within courtyard spaces.

Keywords – Natural Lighting; Courtyard Geometry; Ecotect Simulation; Arid Climate; Energy Efficiency

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Sustainable Agriculture Solutions: Harnessing Chlorella and Microalgae for Biofertilizer Fabrication

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*Abstract –*The rapid depletion of natural resources, climate change in addition to the increasing world population is the most problems that need to solve now. Microalgae especially chlorella's sp are ideal for the food sector because of their fast growth rate and ability to survive in harsh conditions. Chlorella is high in proteins, essential and non-essential amino acids, lipids, sugars, vitamins…... The fabrication of biofertilizers involves extracting and processing this nutrient-rich micro algal biomass into formulations that enhance soil fertility. The resulting biofertilizers offer an eco-friendly alternative to conventional chemical fertilizers, promoting sustainable agricultural practices and minimizing environmental impact. This integration of Chlorella and other microalgae into biofertilizer fabrication represents a harmonious synergy between nature's microscopic wonders and the agricultural landscape. As we delve into the cultivation of Chlorella and the innovative production of biofertilizers, we embark on a journey towards greener and more sustainable agricultural practices, fostering soil health and crop productivity. Bloom collected from Bird Lake (lac des oiseaux) in October 2022.Chlorella sp were isolated then cultured using BG11 medium in a culture room at $25 \pm 2C$ then we monitored the growth rate by cell counting using Malassez counting cell. Exponential growth is allowed, and after 25 days, a concentration of $8.6×10^5$ cells/ml and $9.8×10^5$ cells/ml respectively is reached. The culture is then harvested by centrifugation, and the biomass is freeze dried then preserved at -80°C until further analysis. Chlorella biomass in addition to other microalgae strains will be used for the fabrication of the agriculture fertilizer.

Keywords –Agriculture Sustainability, Microalgae, Chlorella Sp, Soil Health, Crop Productivity

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Purification, Applicability and Characterization of the Natural Algerian Clay for Anionic Dye Removal: Kinetic, Isotherm and Thermodynamic Studies

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Abstract – Removal of dyes by low-cost adsorbents is an effective method in wastewater treatment. Algerian natural clays were determined to be effective adsorbents for removal of an acidic dye (Congo red) from aqueous solutions in batch processes. Characterizations of the clays were carried out by fourier-transform infrared spectroscopy (FTIR), x-ray diffraction (XRD), and scanning electron microscopy (SEM).Effects of the operational parameters such as adsorbent dosage, initial dye concentration, solution ph and temperature were investigated on the adsorption performance. Adsorption isotherms like Langmuir, freundlich and temkin were used to analyze the adsorption equilibrium data and Langmuir isotherm was the best fit. Adsorption kinetics was investigated by pseudo-first-order; pseudo-second-order and the results showed that the adsorption system conforms well to the pseudo-second-order model. The thermodynamic parameters of adsorption ($\Delta S°$, $\Delta H°$ and $\Delta G°$) were obtained and showed that the adsorption processes were endothermic. Adsorption efficient of CV increases with pH decreases for clay the adsorption efficiency increased with increasing temperature, indicating that the adsorption of Congo red on clay was endothermic. This fact is confirmed by calculating $\Delta S°$. The positive change of the entropy indicated that randomness became greater at solid/solution interface and there was an affinity of the clays toward CV. The clay conformed well to the pseudo-second-order model. Langmuir, freundlich and temkin isotherm models were used to describe adsorption equilibrium. The experimental data were well fitted by the freundlich isotherm. The adsorption reaction is spontaneous because $\Delta G°$negative.

Keywords – Clay, Adsorption, Congo Red, Isotherm Clay

Influence of traditional materials on the thermal performance and energy consumption of buildings

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*Abstract –*Throughout history, humans have relied on locally available building materials to adapt to various climatic conditions and environments. Recent research focusing on traditional building materials in arid climates has underscored the significance of integrating stone with modern construction materials. This study endeavors to conduct a technical, energetic, and thermal analysis of several stone-built structures, including an ancient dwelling in the Ksar of Ghardaïa, a residence in Sidi Abbaz, and a house in the Ksar of Tafilalte. The analysis will be conducted while considering the specific climatic conditions of each location. Moreover, the primary objective of this research is to promote the utilization of local materials, particularly stone, in constructing residences within arid climates, while preserving the regional architectural style and ensuring thermal comfort amidst the climatic challenges of the Ghardaïa region. Consequently, the results obtained from numerical thermal simulations, conducted using the Comfi-Pléiades software, emphasize the importance of combining stone with contemporary construction techniques. Notably, incorporating insulation materials into these solutions enhances the efficiency of the building envelope, thereby reducing energy consumption and ensuring optimal comfort for occupants. In conclusion, by integrating climate data and advanced building material techniques, it is now feasible to construct energy-efficient buildings that provide superior comfort for inhabitants.

Keywords – Stone-Based Envelopes; Neo-Vernacular Architecture; Energy Consumption; Thermal Comfort; Annual Dynamic Simulation; Contemporary Vernacular Architecture.

A Study Concerning Deformed Sasaki Metric on the Tangent Bundle

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Abstract – The bundle tangent to a manifold plays a key role in differential geometry. It becomes a space Riemannian more interesting when equipped with the Sasaki metric (the base manifold being assumed Riemannian). However, although it is "naturally" defined from the base metric, Sasaki's metric presents an extreme rigidity" with respect to the basic metric; this has been made natural the introduction of other Riemannian metrics on the tangent bundle (the Cheeger-Gromoll metric in is an example).

In this work, we introduce the geometry of tangent bundles in particular "the natural metrics on the tangent bundle". Our work aims the study of the more general class of natural metrics on the tangent bundle. This made it possible, among other things, to highlight the properties of heredity of these metrics, an extreme rigidity of the elements of a subclass of these metrics and to obtain structures interesting geometries on the tangent bundle endowed with a natural metric of a certain type.

Keywords – Differential Geomrtry, Tangent Bundles, Natural Metrics , Curvatures, Anti-parakahler manifolds.

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Changes caused by extreme factors in various organs of plants

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Abstract - The defense response of plants against salinity is complex and related to many biological processes. The negative effect of salt stress manifests itself in all stages of plant development, including germination, seedling, vegetative and generative development stages. On the other hand, salt tolerance varies in different plants during the developmental stages of plants. For example, it was determined that depending on the stages of development of rice, barley , and wheat , their degree of salt tolerance differs. The organ directly exposed to salt stress in plants is their roots. The processes occurring in the root system of plants are primarily the main indicators of salt tolerance. Changes in the development and architecture of roots during salt stress depend on the degree of salinity, type and mineral content of the soil . In experiments conducted with Arabidopsis, Sun and his colleagues determined that geotropism in roots decreases during salt stress, and due to the resulting induction signal, roots change the direction of growth of roots despite the influence of gravity and direct them towards water. The elongation of the main root slows down more than that of the lateral root, the number of lateral roots increases significantly, the synthesis of auxin stops.

Keywords: Against Salinity, Salt Tolerance, Root, Biological Processes,Indicators

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The Integrity and Efficiency of the Civil Service: Enhancing Public Administration in Kosovo

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Abstract – The Civil Service of the Republic of Kosovo operates on principles of meritocracy, accountability, and transparency, ensuring the recruitment of qualified personnel and the provision of efficient public services. Civil servants are evaluated annually, with their performance influencing career advancement and other benefits. The administration formulates policies, oversees implementation, and proposes legislative acts related to civil service. Interaction with databases is managed through a centralized registry, protecting personal data by law. Oversight of management legality is conducted by an independent council, while the Kosovo Institute for Public Administration develops employee capacities. Disciplinary measures are imposed for violations, with procedures outlined for investigation and appeal. Termination of employment occurs due to various factors, including retirement, disability, or legal sanctions. The Law on Public Officials encompasses all government employees, with exceptions for certain high-ranking positions. Special status officials are subject to additional regulations tailored to their roles and responsibilities. Overall, the civil service framework in Kosovo aims to ensure professionalism, integrity, and efficiency in public administration.

Keywords – Meritocracy, Accountability, Transparency, Disciplinary Measures, Termination of Employment.

Improvement of Anaerobic Digestion of Dairy Waste by Mechanical "Ultrasonic" Pretreatment

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Abstract – Methanization is a biochemical process which allows the degradation of organic matter by microorganisms in the absence of oxygen and in the presence of nutrients which accelerates this mechanism in order to obtain methane.

This dissertation work concerns the study of the anaerobic digestion of whey "dairy waste" with sludge under the effect of mechanical "ultrasonic" pretreatment in the mesophilic.

The parameters that influence the solubility of whey were measured in such as MES, MVS, DCO_S, DCO_T, biogas accumulation and methane.

Ultrasound pretreatment was applied by varying the ultrasound exposure time (2min, 7min, 12min, and 17min).

Keywords – Daily Wastewater, Solubility, Biodegradability, Methane, Traitment.

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Method to automatically remove residual center due to CPO toolpaths for any pocket contour shape

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Abstract – One of the issues encountered in pocket machining with the Contour-Parallel Offset (CPO) strategy is the appearance of uncut areas in the center of the pocket. This is due to the contour addition criterion, which is linked to the length of the passage segments from one contour to another. One might think that these central uncut areas could be ignored for subsequent machining, but this is not the right solution. In fact, it's not efficient to spend time detecting these uncut zones in the center and coming back later to remove them, especially for serial machining. An alternative solution is to develop an algorithm that uses a new criterion to stop the cutting tool in any situation without retraction. This proposed method involves eliminating the material residue left by the cutting tool by automatically adding an optimized passage segment and a reduced loop if necessary.

Keywords – Parallel Offsetting, Automatically Remove Residual, Center Uncut, Any Pocket Contour

Python in well jet pump design systems automation

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Abstract – At present, the integration of Python programming has become an integral part of most engineering calculations. Python is an interpreted high-level object-oriented language with strict dynamic typing. Its clean syntax and the ability to utilize both standard and user-created libraries to solve a variety of problems are defining advantages. The developed algorithm for automated design of a hydrojet ejector includes the following blocks:
– block of imported libraries, "Matplotlib" and "NumPy", which are fundamental for constructing graphs and working with large volumes of data in Python.
– block of functions for calculating basic geometric parameters.
– graphs and textual results displaying block.
The input data for the calculations are standardized series of geometric dimensions of the borehole jet pump flow part elements and structures of ground pumping units. The ranges of variation of these dimensions are determined according to the recommendations of Kobe Company (USA), which is a leader in the application of ejection technologies in the field of oil and gas. The efficiency factor (Efficiency) was chosen as the optimization criterion for choosing the geometrical parameters of the ejector. Algorithms were developed to select the maximum efficiency values from the obtained array, which automatically determine the highest efficiency values, corresponding design and operating parameters of the ejector. The array of data obtained with the help of the specified algorithms is presented in the form of a graphical three-dimensional dependence, which made it possible to determine the optimal geometric parameters of the borehole jet pump.

Keywords – Jet Pump, Ejector, Design Automation, Python, Calculation Program

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Analysis of selected parameters of partial 3D models obtained by gradual reduction of the number of photo frames

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Abstract – Photographs of the object are used to create 3D models using photogrammetry. However, it is not always possible - especially for time or technical reasons - to obtain sufficient photographs. It is even often only possible to obtain photographs for the creation of partial 3D models. In such cases, the use of video seems to be a suitable solution. Instead of lengthy photography, we create a short video and get the appropriate number of photo frames by separating them from the video. In our paper, we focus on the description of the characterization parameters of the 3D models, created by gradually reducing the photo frames that we obtained from the video. The parameters describing the quality of a 3D model are generally accepted and known. We have chosen a few basic parameters that we observe, such as The median of keypoints per image, Number of 2D Keypoint Observations for Bundle Block Adjustment and so on.

Keywords – Pix4Dmapper, Photogrammetry, 3D models, partial 3D models, OPPO Reno 5z

Evaluation of NiO and ZnO thin films for photocatalytic application

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Abstract – Nickel oxide (NiO) and Zinc oxide (ZnO) are a metal oxide a p-type and an n-type semiconductor respectively, that have a wide bandgap of about 3.6 eV for NiO and 3.37eV for ZnO at room temperature, high electrical conductivity, transparent to visible light, and chemical properties. ZnO and NiO have a various application area such as photocurrent, photocatalyst, light emitting diodes, gas sensors, magnetic, electrochromic, transistors and solar cells ………….

In this work, the synthesis of zinc oxide and nickel oxide thin films for photocatalytic application as a starting material by the sol-gel dip coating method, and then deposited on a glass substrate to form thin films, these films were annealed at 500 ˚C. The structural and optical properties of NiO and ZnO thin films were measured by X-ray diffraction (XRD), Ultraviolet spectroscopy (UV-visible) respectively. These results; The ZnO thin film has been demonstrated to be a polycrystalline with a hexagonal crystalline structure of wurtzite (JCPDS Chart No. 00-036-1451), while NiO has been shown that it is

Halite, Rock Salt structured and crystallizes in the cubic (JCPDS Chart No. 00-047-1049), and no secondary phases were observed, UV- visible transmittance spectra of the prepared film revealed good transparency in the visible region, the FESEM image of ZnO revealed morphology nanorod nanoparticle with smaller grain size, the surface of NiO was smooth and the nanograins were uniformly distributed.

Keywords – Photocatalytic, NiO, ZnO, XRD, UV-visible

Investigation of a convective spiral porous fin under a magnetic field

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Abstract – Effective cooling technology plays a critical role in ensuring the proper and reliable operation of thermal components, equipment, and systems by eliminating excess heat. Fins or expanded surfaces are one of the many passive and active cooling alternatives that are crucial and significant in such occurrences. This study describes how a convective porous spiral fin behaves in the presence of a magnetic field ; The main advantages of a spiral heat exchanger are its high overall heat transfer coefficient, compacte size for a given heat exchange area, relatively low- pressure drop and ease of cleaning. Spiral heat exchanger flow may be countercurrent flow, concurrent flow or cross flow.
The interaction between the porous medium and the fluid is simulated by Darcy's formulation. The effects of Hartman number, Rayleigh number, porosity, fin parameter, and the pitch of the spiral fin are experimentally investigated.
The mathematical representation resulting from an analysis is a highly non-linear 2nd order differential equation. Complemented by the boundary conditions, the nonlinear system was solved numerically using MATLAB software.
It is found that the presence of a magnetic field increased heat transfer; on the other hand, high porosity, low Rayleigh number, and a low fin parameter made the fin more efficient.

Keywords – Spiral Fin, Convection, Porosity, Magnetic Field

Modelling of the beam-column bolted end-plate connections in steel structures

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Abstract – The old steel structures design, the practice of calculation of the beam-column connections still often refers to the assumptions of rigid or pinned types.

In the rigid connections, where no relative rotation occurs between the connected members, transfer not only substantial bending moments, but also shear and axial forces. On the other extreme, almost free rotation movement between the connected elements that prevent the transmission of bending moments characterizes pinned joints. Despite these facts, the great majority of joints does not exhibit such idealized behaviour.

It was proved that the introduction of the concept of a semi-rigid connection into a steel frame structure, not only allowed, by a more precise and more realistic calculation to carry out a surer checking and dimensioning, but also to lead to a less expensive structural design.

In order to investigate the characteristics of beam-column bolted end-plate connections in steel frames, a large-scale general-purpose finite-element package is selected to analyze several end-plate connections with various types and details. From the finite element analysis (FEA), using ANSYS code, the interaction between the end-plate and column flange, as well as geometric and material nonlinearities has been considered.

Keywords – Steel Frames, Modeling, Beam-Column Connections, Bolted End Plate, Nonlinear Analysis, Elasto-Plastic Behaviour

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Analysis of the seismic response of reinforced concrete structures fitted with viscous fluid dampers

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Abstract – By enhancing a structure's rigidity (as in the instance of RPA99/2003), construction processes are used in most seismic codes to mitigate the dangers connected with seismic occurrences, but with the understanding that some degree of disorder is inevitable. This technique fails when the earthquake has a high return frequency or when there are large structures that need to continue operating, like hospitals or civil defence barracks. The application of passive seismic energy dissipation devices to reinforce structures in order to safeguard them has given rise to novel strategies, including the usage of fluid viscous dampers (FVD).

his research seeks to evaluate the effects of fluid viscous dampers (FVD)-based passive seismic energy dissipation systems on the maximum acceleration, displacement, and load responses of reinforced concrete frames. To this goal, SAP2000 software was used to perform time-dynamic calculations on a reinforced concrete building using the Boumerdes seismic signal from May 2003. The structure is composed of a ground level and six stories that are strengthened by AFV shock absorbers, which provide a force-velocity relationship that is linear.

Discussion was held regarding the findings of the analyses done to determine how the portal frame would react both with and without this kind of energy dissipator. The great ability of these dampers to raise the gantry's dissipative potential without increasing its stiffness was demonstrated in the conclusions, which helped to lower the amount of materials needed for the system's overall stability.

Keywords – Reinforced Concrete Structure, Earthquake, Bracing, Energy Dissipation, Viscous Fluid Damper

Recovery and recycling of plastic waste in concrete

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Abstract – The remarkable development of plastic materials in recent times has made the question of their impact on our daily lives and on the environment particularly sensitive. In order to find suitable processes for minimising or recovering plastics and avoiding their invasion of the environment, plastics have been incorporated into concrete.

International articles on this subject were analysed in peer-reviewed scientific journals. The critical benchmarks analysed were: the characteristics of the plastics, the proportions of the mix and the properties of the concrete in the fresh and hardened states, such as workability, density and weight, compressive strength and tensile strength, flexural strength and modulus of elasticity, as well as durability and thermal conductivity, the latter being important aspects.

It is necessary to highlight some of the benefits of adding recycled plastics on properties Although some properties have been negatively influenced by the presence of plastics. but further research and studies are recommended to improve the understanding of these properties.

In this context, the aim of our work is to recover and recycle plastic waste, in particular PET, in concrete under extreme conditions. The approach consists of formulating characteristic concrete in order to have the right composition of aggregates and the optimum percentage of PET.

Keywords – Plastic Waste, Recovery, Recycling, Concrete.

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Elimination of cyanotoxins using bioactive compounds extracted from aquatic macrophyte

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Abstract – The eutrophication of lakes stands as a significant environmental concern today. Within eutrophic water bodies, the influx of surplus nutrients like nitrogen and phosphorous triggers a progressive surge in phytoplankton abundance and recurrent formation of water blooms. These events often impede or devastate the lake ecosystem and its aquatic functionalities. Macrophytes play a crucial role in shaping the biological composition and maintaining the water quality of shallow lakes. Some strains of cyanobacteria, such as M. aeruginosa, produce toxins to which humans can be exposed through recreation, drinking water and food. Eliminating cyanobacteria and their toxins is a crucial approach to controlling harmful algae. Recently, macrophytes have emerged as promising tools for biological control of harmful cyanobacterial blooms. They release metabolites, known as allelochemicals, into the water, and allelopathy has been proposed as one of the main mechanisms by which macrophytes control phytoplankton biomass and taxonomic composition in aquatic ecosystems. In our study, we used bioactive compounds extracted from the leaves of Nymphaea alba to investigate their effect on the growth of Microcystis spp. The results suggest that the cell density of Microcystis spp decreased compared to the control group, indicating that these compounds could be recommended as a remedy against the contamination of water bodies by harmful blooms.

Key Words: Microcystis Sp, Nymphaea Alba, Cyanobacteria, Macrophytes, Blooms.

The effect of silver nanoparticles toward properties and antibacterial activity of silver-alginate nanocomposite films

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Abstract – Preparation of silver-alginate nanocomposite films as an antibacterial material has been carried out through the casting method of colloidal nanocomposite silver-alginate. Colloidal was made by green reduction of AgNO3 precursor salts and using alginate as a stabilizer and reducing agent and NaOH as an accelerator. The appearance of a brownish yellow color, due to the addition of variation of AgNO3, and the localized surface plasmon resonance (LSPR) phenomenon were identified by UV-Vis spectrophotometer, indicating that silver nanoparticles have been formed. The properties of obtained silver nanoparticles was then examined. The shape and size distribution of silver particles were determined based on the image on transmission electron microscopy (TEM), chemical properties (FTIR), mechanical, crystallinity (XRD), and surface morphology (SEM). Testing of antibacterial activity was performed on silver-alginate nanocomposite films using the diffusion method for gram-positive (S. aureus) and gram-negative (E. coli) bacteria. The results showed that based on the UV-Vis spectrophotometer characterization results, the LSPR phenomenon appeared at the absorption peak of 400.02–408.90 nm, denoting silver nanoparticles with a spherical shape of 5–26 nm have been formed. Further, the presence of silver nanoparticles affected the mechanical properties of the film, where the tensile strength of the film tended to decrease with the increase in the silver nanoparticles concentration while the crystallinity increased. Next, based on the SEM results the nanocomposite films of silver-alginate had a rough and porous structure. The nanocomposite film had antibacterial activity against E. coli, S. aureus. The antibacterial activity film was affected by the concentration of silver nanoparticles.

Keywords – Nanocomposite, Silver Nanoparticle, Alginate, Properties, Antibacterial Activity.

Adsorption of an azo dye by an intercalated 1:1 clay

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Abstract – Water pollution is one of the most worrying aspects of the degradation of the natural environment. Among the sources of pollution are dyes. These pollutants have a serious toxicological impact on the environment and human health. Among the many dyes identified is acid orange 7. Numerous pollution control methods have been developed, including adsorption. The intercalation of organic compounds is a method of choice, as it enables nanohybrids to be obtained that are capable of interacting with organic pollutants.

This study focused on the intercalation of the clay mineral halloysite. The material was characterized by various techniques (XRD, SEM). After intercalation and characterization, nanohybrid and crude halloysite were used as adsorbents for orange acid 7. Various parameters were taken into account during adsorption. A kinetic study showed that 240 minutes were sufficient to reach equilibrium. Four kinetic models were used to determine the parameters and mechanism controlling the adsorption phenomenon. The results showed that adsorption follows pseudo-second-order models e This means that the adsorption of orange acid 7 depends on the adsorbate-adsorbent couple , The experimental isotherms are L-shaped and are described by the Langmuir model. Methanol proved to be the most efficient eluent for dye desorption, while organohalloysite maintained its adsorption capacity over five cycles.

Organohalloysite's affinity for the dye is greater than that of crude halloysite. In other words, intercalation increased the basal distance, resulting in better adsorption.

Keywords – Halloysite; İntercalation; Caractérisation; Dye; Adsorption.

Studies on association of diet with acne vulgaris among adolescent girls

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Abstract – Acne vulgaris is a chronic inflammatory disease of the pilosebaceous units that affects 85% of the world's population aged 11-30 years. Diet is believed to affect the severity of acne vulgaris. Evidence exists highlighting the association of acne and high glycemic loads, certain dairy products, and refined sugar product ingestion. Future studies are required to determine if dietary modification will reduce long-term acne burden. This study is designed to identify possible associations of diet with acne vulgaris in adolescent girls living in Sargodha. A cross-sectional study was conducted among adolescents. Students was interviewed for demographic data, history of acne, and frequency of intake of specific foods in the previous 12 months. Each participant was examined for facial acne. Body mass index (BMI) was calculated for each participant. The results of this study discovered that dietary factors play a vital role in development of acne vulgaris. Most of the acne patients were eating unhealthy food and have poor hygiene. Nowadays they tend towards mostly junk foods that have adverse effect on their health results in acne break out. Girls are careless about their acne severity and not consult to doctors due to the fear and parents view that is a factor for causing acne more severe. They are having a diet that is directly aggravating their acne. They should change their eating plan and starts take care of their hygiene to avoid bacteria. However, quality of life is significantly impaired in patients of severe acne

Keywords – Acne, Diet, Quality Of Life, Adolescents, Girls

Statistical Modelling of global communicable diseases in the aspect of demographic, economic, and environmental indicators using generalized linear mixed models with multi-random effects

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Abstract – Communicable diseases are infectious diseases that can spread from person to person every year, causing the death of hundreds of thousands of people and significantly threatening public health. Disability-adjusted life years (DALYs) is an important criterion measuring the years of life lost by a person due to a negative situation such as illness, injury or infectious diseases, and the quality of life. In this study, the relationships between DALYs from communicable diseases and countries' income levels, urbanization, net immigration rate, median age, forested area, and human development index (HDI) for 187 countries from six continents in 2019. Four generalized linear models and twelve generalized linear mixed models (both GLMs and GLMMs) having binomial distribution with different random effects such as countries, continents, and both of them under "logit", "probit", "cloglog", and "cauchit" link functions are used for modelling DALYs data in the global aspect of population and demographic change, and also economic, development, and environmental indicators. As a result of sixteen modelling, GLMM having binomial distribution with country and continent-random effects under "logit" link function is detected as the best fitted model according to information criteria as AIC with 100.766, AICc with 102.870, BIC with 142.770, and CAIC with 155.770. According to these statistical findings, it has been detected that increases in urbanization and net immigration rates have a positive effect on DALYs from communicable diseases, while increases in countries' income levels, median age, forested area, and HDI have a negative effect.

Keywords – Generalized Linear Model, Generalized Linear Mixed Model, Random Effect, Logit, Probit, Cloglog, Cauchit Link Function, Communicable Disease, Disability-Adjusted Life Years.

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Nanotechnology in Environmental Remediation:

An Environmentally Sustainable Approach

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Abstract – The escalating concerns over environmental pollution have intensified the exploration of innovative and sustainable remediation strategies. This mini review examines the burgeoning field of nanotechnology and its promising applications in the remediation of organic and inorganic pollutants from aqueous mediums. Nanotechnology, with its unique ability to manipulate materials at the nanoscale, offers a change in thinking in environmental remediation by providing highly efficient and targeted solutions. This mini review discusses the diverse array of nanomaterials employed to remove pollutants, encompassing organic contaminants such as pesticides, industrial chemicals, and emerging pollutants, as well as inorganic species like heavy metals. The distinct physicochemical properties of nanomaterials, including high surface area, reactivity, and tunable surface functionalities, enable enhanced adsorption, degradation, and immobilization of pollutants. Moreover, the environmentally benign nature of many nanomaterials contributes to the overall sustainability of these remediation approaches. The mini-review emphasizes recent advancements in nanotechnology-based remediation strategies, ranging from developing novel nanomaterials to integrating nanocomposites and nanocarriers for targeted delivery. Additionally, the potential risks and ethical considerations associated with the application of nanotechnology in environmental remediation are briefly discussed. Overall, this mini review highlights the pivotal role of nanotechnology in advancing sustainable solutions for water remediation, providing insights crucial for researchers, policymakers, and environmental practitioners aiming to address the escalating challenges of water pollution.

Keywords – Nanotechnology, Environmental remediation, Organic pollutants, Inorganic pollutants, Aqueous medium.

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SABİT GRANÜL MİKTARLARI İÇİN AÇIK KAYNAKLI DOLUM MAKİNESİ TASARIMI VE İMALATI

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Özet – Bu makale, Ölçüm miktarının ayarlanmasında kullanılan sensörlere duyulan ihtiyacı ortadan kaldıran mekanik bir mekanizma kullanarak malzemeleri niceliksel olarak ölçen bir dolum makinesinin tasarımını ve imalatını sunmaktadır. Makine, 500 ml'ye kadar kapasiteye sahip kaba veya granüler malzemelere uyacak şekilde özelleştirilmiştir ve elektro-pnömatik bir sistemle kontrol edilmiştir. Çift etkili bir silindir tarafından hareket ettirilen dik silindirik bir kap kullanılmıştır. Konteyner, üstteki bir açıklıktan doğrudan tanktan doldurulur ve boşaltıldığında yatay olarak yer değiştirerek tankın malzemelerin ağırlığı nedeniyle alt kapağın açılmasına, bu da konteynerin doldurulmasına neden olur. Bir konveyör bandı tasarlanıp Bu konveyör, bir sürücü devresi kullanarak dc motor ile çalıştırılmıştır. İşlem, iki kızılötesi (IR) sensörü ve konveyör bant sistemi ile bir Arduino uno mikro denetleyicisi tarafından otomatikleştirilmiştir. Silindirin açılma ve kapanma hareketi, kontrol ünitesinden sinyal alan bir 5/2 solenoid valfı ile kontrol edilir. Ayrıca, makinenin tasarımı ulaşılabilirlik ve uyumluluk için özelleştirilmiştir ve tüm bileşenler 200x200 mm'lik bir inşaat alanında veya iş yerinde 3D baskı ile üretilebilir. Tasarım ve yazılımın açık kaynak yapısı, topluluk tarafından yapılan iyileştirmeleri ve uyarlamaları teşvik eder ve otomatik paketleme sistemlerinde sürekli iyileştirme ve yenilik için işbirliğine dayalı bir ortamı teşvik eder. Farklı malzemeler üzerinde yapılan deneyler olumlu değerlendirilmiştir.

Anahtar Kelimeler – Otomatik Dolum Makinesi, Elektro-Pnömatik , Mekanik Niceliklerin Ölçümleri , Konveyör Bant, Kontrol Sistemi.

Preliminary characterization of herbal extracts from two local lamiaceae species

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Abstract – Interest on herbal extracts from aromatic and medicinal plants are raising because of their richness with bioactive compounds that lead their applications in pharmaceutics, cosmetics and food. Essential oils are secondary metabolites synthetized by aromatic plants. Mint and sage are medicinal and aromatic plants from the Lamiaceae family, which are abundant in the Mediterranean basin. The aim of the present work is a preliminary characterization of essential oils from local mint and sage plants. Each plant was subjected to hydrodistillation to obtain the essential oil. Chemical composition of each oil was examined by gas chromatography coupled with mass spectrometry. The analysis identified nineteen and thirteen volatile components in mint and sage essential oils respectively with various amounts. Abundance of oxygenated monoterpenes was observed in mint essential oil that represented about 86 % of the total oil however only 21% of oxygenated monoterpenes were detected in sage essential oil. Mint essential oil was dominated by menthol, menthone and neomenthol that represented almost 72% of the oil. Linalyl acetate and β-linalool constituted the most prominent molecules in sage oil which constituted about 79% of the oil. It can be concluded that both mint and sage essential oils studied in the present work had interesting chemical compositions. The presence of some bioactive compounds in these extracts lead them to be considered as promising natural and economic products that can be substitute chemicals in food, pharmaceuticals and cosmetics.

Keywords – Local Aromatic And Medicinal Plants, Lamiaceae, Essential Oils, Comparative Study, Chemical Composition

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A Numerical Investigation on Flow Induced Vibrations of Circular Cylinders in Shallow Waters

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***Abstract** –* Flow-induced vibration (FIV) of circular cylinders has been a significant fluid-structure interaction (FSI) phenomenon and studied extensively in the past several decades. Specifically, as a prominent sub-branch of FIV, vortex-induced vibration (VIV) of circular cylinders has gained significant attention due to its recent renewable energy applications. In this numerical study, the VIV performance of a circular cylinder placed in shallow waters is investigated. The cylinder is positioned with blockage ratios of ∞, 1/8, 1/7, and 1/6, where the distance above and below the cylinder is kept equal. The study aims to determine the adequate blockage ratio of constrained configurations to capture significant oscillations similar to those observed in cylinders positioned sufficiently away from bottom boundaries and free surfaces. The findings of this study provide valuable insights into the dynamics of fluid-structure interaction in shallow water environments with limited clearance. Understanding the behavior of circular cylinders under such conditions is crucial for optimizing the design and operation of various engineering structures subjected to flow-induced vibrations, such as renewable energy converters in rivers. The results show that a circular cylinder in shallow water with a blockage ratio of 1/7 or above generates similar VIV performance to cylinders positioned in an infinite water environment.

Keywords – Flow-Induced Vibrations, Vortex-Induced Vibrations, Circular Cylinders, Shallow Waters

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Investigating Impact of Carbon Dioxide Concentration on *Halyomorpha halys* Stål, 1855 [Hemiptera (Heteroptera: Pentatomidae)]Egg Hatching: A Response Surface Methodology Approach

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Abstract – Nowadays, due to global warming, both carbon dioxide (CO_2) rise and temperature increase occur. Such climate changes have significant effects on living things. In this research, the reproduction and egg formation of *Halyomorpha halys* Stål, 1855, also known as the hazelnut pest in the Black Sea Region in our country, was monitored. An air-conditioning cabinet and CO_2 application system suitable for global climate change were developed and the hatching status of the eggs of this pest was examined. Response surface methodology (RSM) was used to investigate and optimize the effects of multiple variables in experimental studies. With this method, necessary evaluations were made in planning the experiments, collecting data, and analyzing the results. RSM, mathematical modeling, and optimization techniques enable us to better understand the results of experiments and optimize processes.

In this study, the hatching number of *Halyomorpha halys* eggs with CO_2 applications has been evaluated with RSM. The effectiveness of experimental working conditions, carbon dioxide ratio, and carbon dioxide application time have been determined by RSM. Statistical analysis has been performed in RSM to evaluate the compatibility of real data and model values. Especially when *Halyamorpha halys* eggs were monitored, egg hatching was observed on the 4th day (96th hour) and 5th day (120th hour). According to the results, increasing the carbon dioxide concentration (ppm) decreased the number of eggs hatched.

Keywords – Halyomorpha Halys, Carbon Dioxide Application, Egg Hatchability, Response Surface Methodology, Optimization

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Evaluation of the effectiveness of beneficial bacteria as an alternative to chemicals

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Abstract – Plant growth promoting rhizobacteria are of great interest because they are beneficial bacteria naturally present in the soil that colonize plant roots and confer beneficial effects that can effectively replace the use of chemical inputs. They can increase yield, stimulate plant growth, reduce pathogen infections and reduce biotic and abiotic stresses. Strains isolated from legume rhizospheric soil from five selected sites were screened for plant growth promoting potential (PGPR) under controlled conditions, for IAA production and P solubilization capacity. more effective will be used as inoculum. The success of inoculating these strains onto the plant depends on their competitiveness with native strains already present in the soil.

*Keywor*ds *– Beneficial Bacteria, Legumes, Rhizospheric Soil, Chemical İnputs, IAA Production, P Solibilisation*

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Comparative study on the photodegradation efficiency of organic pollutant using ZnO catalyst

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Abstract - Synthetic dyes resulting textile and other industrial activities re one of the most common contaminants discharged into wastewater. Organic dyes from water have always been a matter of interest due to their high toxicity where some techniques have been developed, such as heterogeneous photocatalysis using titanium dioxide (TiO2) for their removal or degradation. In this research the degradation of direct blue 14 as a dye pollutant has been investigated using ZnO nanoparticles. The influence of several parameters such as solution pH, initial concentration of dyes, photocatalyst particle size and calcination temperature on the photocatalytic degradation was evaluated by using UV spectroscopy. The experiments were firstly conducted by varying the amount of ZnO nanoparticles between 10 and 60 mg/l for fixed solution pH. Then after, for optimized amount of nanoparticles, the effect of the solution Concentration was studied in a range between 15ppm and 44ppm. Finally, the Calcination temperature range studied was between 400 and 500°C. The obtained results showed that the total degradation of the pollutant was achieved in the presence of 50 mg of ZnO, for a solution pH of 7 and calcination temperature 400 °C.

Keywords –Photocatalysis, Calcination, Zinc Oxyde, Dye, Organic Dyes

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Production and Characterization of Non-Pressure and Cast Urea Formaldehyde Composites by Using Hot Air

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Abstract – The human population has increased tremendously over the last century. This increase has caused the rapid destruction of forest resources. This makes it difficult to access raw wood materials. When the forest products industry could not meet its needs for wood, it tried to meet this need using wood composites obtained from wood residues. Urea formaldehyde is one of the most used thermosetting resins in wood composite production worldwide. Urea formaldehyde combines wood particles under temperature and pressure to form a rigid structure. This material is generally used in the production of boards, such as medium-density fiber boards (MDF) and particleboards (PB).

In this study, UF glue was mixed with organic materials (pine flour, pine fiber, MDF powder, and wheat flour) and hardened in hot air without pressure. The samples were characterized physically and mechanically. According to the results, water absorption (WA) of the samples with added MDF powder was lower than that of the other samples. Both WA and thickness swelling (TS) of the WF-added samples were high, whereas the pressure strength and screw withdrawal (SR) strength were low. In this case, it can be said that the addition of WF significantly reduces the UF durability. It was concluded that with the method used in this study, UF composites with organic particle addition could be produced using only hot air without pressure.

Keywords – Urea Formaldehyde, Organic Filler, Wood Material, Termoset Resin, Without Pressure

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A Review: Methods and Fillers for Recycling Polystyrene

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Abstract – Today, with the rapidly increasing human population, the need for wood has become impossible to meet from forests. For this reason, people established industrial plantations. In addition, substitute polymers that can be used instead of wood raw material have been developed. One of these is polystyrene (PS) wood mixture composite materials. PS is one of the most used thermoplastic polymers in the world. PS is a petroleum-derived synthetic polymer and takes a long time to recycle in nature. For this reason, many researchers are working on the possibilities of recycling and reusing polystyrene. Some methods have been developed for this purpose. In these methods used, PS can be strengthened by using different fillers. The fact that these fillers are natural is also important as it reduces the degradation rate of PS in nature. Studies on this subject will help both preserve the ecological balance and use petroleum-derived materials efficiently. This is an important issue in terms of protecting the world we live in. In this study, recycling methods of PS and natural polymers used as fillers are compiled.

Keywords – Polystyrene, Synthetic Polymer, Organic Filler, Recycling, Forest Resource

A two-lobe journal bearing lubricated with non-Newtonian fluids: the impact of the aspect ratio on its performance

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Abstract – Designing journal bearings is crucial for improving the effectiveness and performance of mechanical systems. The aspect ratio, which represents the ratio of the bearing's length to its diameter, is a significant factor that profoundly influences the behavior of these systems. This dimension is particularly important for two-lobe journal bearings lubricated with non-Newtonian fluids as it impact the fluid dynamics within the bearing clearance, thereby affecting the overall system performance. Through the use of the power law model, the purpose of this study is to determine the aspect ratio effects on the static performance characteristics of two-lobe journal bearings operating with non-Newtonian lubricants. The fluid's non-Newtonian behavior necessitates the development of the modified Reynolds equation, which is then solved using the finite difference method to determine the fluid film pressure. For different values of aspect ratio, power law index, and eccentricity ratio, the static characteristics in terms of load-carrying capacity, friction force, and side leakage are obtained. The outcomes of the present research demonstrate that the reduction in the load-carrying capacity, frictional forces, and side leakage is caused by larger aspect ratio values and lower power law index and eccentricity ratio values. The results revealed that, in comparison to two-lobe journal bearings lubricated with Newtonian fluids, the aspect ratio has a notable impact on the bearings' performance lubricated with non-Newtonian fluids. Moreover, the results emphasize the potential for shear-thickening fluids to improve the longevity and operating efficiency over pseudoplastic and Newtonian fluids to lubricate the two-lobe journal bearing.

Keywords – Two Lobe Journal Bearings, Non-Newtonian Lubricant, Power Law Model, Static Characteristics, Aspect Ratio.

Adsorption-Based Removal of Malachite Green Dye from Aqueous Solutions Using Potato Peels: An Experimental Study

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***Abstract** –* The rising demand for adsorbents in environmental protection processes leads to escalating costs, highlighting the need for alternative adsorbent materials derived from non-conventional sources, such as plant-based waste and biomass. This study explores the use of potato peelings (EPT) as a bioadsorbent to remove malachite green dye (VM) from aqueous solutions. The investigation assesses the impact of various parameters, including stirring speed, pH, bioadsorbent mass, and contact time, on the adsorption process. Additionally, the study examines adsorption kinetics and isotherms.

Our experimental results revealed optimal conditions for malachite green removal: a bioadsorbent mass of 2 grams, pH 12, an initial dye concentration of 300 mg/L, and a stirring speed of 600 rpm. The kinetic data indicate that the adsorption process involves intraparticle diffusion, while the adsorption isotherms are well described by the Brunauer-Emmett-Teller (BET) model. These findings suggest that potato peelings are a promising, cost-effective bioadsorbent for removing dyes from wastewater, offering a sustainable solution to conventional adsorption methods and contributing to environmental protection efforts.

Keywords – Adsorption, Bioadsorbent, Malachite Green, Spectroscopy, Adsorption Parameters

Deep insights into the Cu- and W-doped $Na_{0.5}Bi_{0.5}TiO_3$ solid solution: A study focusing on optical, dielectric, and electrical properties

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Abstract – $Na_{0.5}Bi_{0.5}TiO_3$ ceramic is among the most promising dielectric materials for several advanced electronic devices due its exceptional features. However, its high oxygen ionic conductivity and wide band-gap energy limit its use for commercial applications. Here, a new Lead-free solid solution, 0.995NBT-0.005BCW, was investigated to enhance the electrical and optical performance of NBT ceramic. 0.995NBT-0.005BCW was successfully elaborated by the solid-state technique. The structural, optical, and dielectric properties were investigated systematically. The incorporation of BCW into NBT improved the long-range order of the structure, facilitated the poling process, enhanced the electrical properties of the pure NBT and led to the local lattice distortion, generating new electronic levels inside the NBT bandgap. The calculated band gap value ~3 eV suggests its suitability in power electronic devices. The variation of dielectric constant and dielectric loss with temperature (370–800 K) at different frequencies (100–106 Hz) showed diffused phase transition. Our compound is a novel material with interesting properties and offers exciting possibilities for engineering and manufacturing applications.

Keywords – Perovskite, X-Ray Diffraction, Dielectric, Conductivity, XPS.

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Leveraging AI-Driven Text-to-Image Technology for Bamboo Structural Architectural Design

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Abstract – The convergence of artificial intelligence with architectural design processes has ushered in a new era of innovation and efficiency. This study aims to explore the integration of AI-supported text-to-image technology in bamboo structural buildings and harness the potential of AI to revolutionize the creation of sustainable and visually impactful structures. In this context, AI algorithms convert text input describing architectural elements, spatial configurations, and design intentions into visual representations of bamboo-based structures. Leveraging deep learning techniques generate realistic and intricate images, providing architects with a powerful tool to visualize design concepts and effectively communicate ideas. Designers can experiment with various configurations, styles and material combinations in virtual environments, receiving instant visual feedback on the feasibility and aesthetic appeal of their ideas. This iterative approach not only accelerates the design iteration process but also enhances creativity and innovation by enabling designers to explore unconventional design solutions. Furthermore, the integration of text-to-image technology into bamboo structural design promotes interdisciplinary collaboration and knowledge sharing. Architects, engineers and AI experts can seamlessly collaborate, leveraging each other's expertise to create sustainable and structurally sound architectural solutions. Bridging the gap between text descriptions and visual representations, it will ultimately be seen as a significant advancement in the field of architecture and provides designers with unique capabilities to conceptualize, visualize, and optimize sustainable structures. By harnessing the power of AI, architects can push the boundaries of creativity and innovation, paving the way for a more sustainable and visually impactful built environment.

Keywords – Architectural Design, Artificial Intelligence, Text-to-image technology, Bamboo Structural Design, Design Process

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Mobilya İşletmesinde 5S Tekniğinin Uygulanması

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Özet – Günümüzün küresel pazar ortamında başarılı olmak için üretim/imalat süreçlerinin yönetiminde ve kontrolünde radikal bir değişiklik gerekmektedir. İşletmeler rekabette yerini koruyabilmek, ayakta durabilmek, büyümeyi ve gelişmeyi sağlamak için kuruluşların verimliliklerini arttırmaları gerekmektedir. Verimlilik artısını sağlamak için israfı önlemek ve kıt olan kaynakları verimli kullanmak gerekir. Tasarruf edilen kaynaklar, daha fazla değer yaratmak, mevcut pazarlarda daha geniş ekonomik olanaklar bulmak ve yeni pazarlara doğru yürümek için gereklidir.

5S, işletmelerdeki düzen ve disiplini sağlamak için kullanılan hem basit, hem de işletmenin en küçük ayrıntılarının denetimini sağlayan ve diğer iyileştirme çalışmalarının temelini oluşturan bir sistemdir. Bu çalışma İzmir ilinde mobilya üretimi yapan bir işletmede 5S tekniği uygulanmıştır. Çalışma sonucunda mobilya işletmesinde düzenli ve temiz bir ortamın yanı sıra, gereksiz malzemelerden arındırılmış, zaman israfı ortadan kaldırılmış ve işletmenin verimi arttırılmıştır.

Anahtar Kelime: Mobilya Üretimi, Yalın Üretim, 5S Tekniği, İsraf, Verimlilik.

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Effect of porosity model on the free vibration analysis of functionally graded sandwich plates

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***Abstract** –* In this work, the free vibration analysis of porous functionally graded material (FGM) sandwich plates is investigated by using the P-version of the finite element method (FEM) which is based on the first-order shear deformation theory (FSDT). The FGM sandwich plate is made up of two face-sheet layers of FGM and one layer of homogeneous core. The present sandwich plate is made of a mixture of metal and ceramic. It is assumed that the boundary conditions of the porous FGM sandwich plate are simply supported. The convergence and comparison studies with previously published results are used to validate the obtained results, an excellent agreement was observed. Three porosities distribution models of FGM sandwich plates are assumed and analyzed. Six types of FGM sandwich plates are studied with the three models of porosity distribution (Imperfect FGM with Even Porosities 'Imperfect I', Imperfect FGM with Uneven Porosities 'Imperfect II' and Imperfect FGM with Logarithmic-Uneven Porosities 'Imperfect III'). Also, a comprehensive investigation of the effects of the thickness ratio and porosity coefficients of the top and bottom layers of functionally graded sandwich plates on the natural frequency is presented. The numerical results shows that the distribution of porosity plays significant role on the free vibration of the functionally graded sandwich plates.

Keywords – Free Vibration Analysis; Functionally Graded Materials; P-Finite Element Method; The First-Order Shear Deformation Theory; Functionally Graded Materials; Sandwich Plates; Porous Plates

Modeling of energy in the bioclimatic house

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Abstract- This study aims to propose a new approach to predict the thermal deformation behavior of building element at different temperature levels (20 °C, 50 °C, 80 °C), by using nonlinear finite element analysis. The new approach is based on the coupling between Burger's rheological model, two-phase composite material models and maturity concept. Burger's rheological model is employed to predict the thermal deformation. Furthermore, the maturity approach is employed to evaluate the mechanical properties of concrete. However, the thermal properties of concrete used in building element are estimated by two-phase composite material models. The obtained results show that increasing the temperature amplifies the rate and the magnitude of the thermal deformation and stress generated by thermal shrinkage.

Keywords: Concrete; Thermal Deformation; Two-Phase Model; Maturity Concept; Burger's Rheological Model.

Potential wells for a hyperbolic-type equation

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***Abstract** –* This presentation focuses on exploring potential wells associated with hyperbolic-type equations, which fall under the category of evolution equations. Evolution equations, defined as partial differential equations where time t serves as one of the independent variables, emerge as fundamental constructs across various mathematical and scientific domains. They find applications not only within mathematics but also extend their influence into diverse fields such as physics, mechanics, and material science. For instance, equations like the Navier-Stokes and Euler equations, fundamental in fluid mechanics, delineate the dynamics of fluid flow, crucial for understanding phenomena ranging from airflow over an airplane wing to ocean currents. Similarly, nonlinear reaction-diffusion equations feature prominently in the study of heat transfer processes and biological phenomena, offering insights into the distribution of heat and the spread of substances within biological systems. In the realm of quantum mechanics, notable equations such as the nonlinear Klein-Gordon and Schrödinger equations play pivotal roles, elucidating the behavior of particles and systems at the quantum level, essential for grasping the fundamental principles governing the universe's smallest scales. These examples underscore the ubiquitous nature of evolution equations, serving as indispensable tools for modeling and comprehending complex phenomena across disciplines. Through an examination of potential wells within hyperbolic-type equations, this presentation endeavors to delve deeper into their significance and applications within the broader framework of evolution equations.

Keywords – Hyperbolic Equation, Potential Well, Energy Identity, Critical Energy, Sobolev Spaces

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Existence and asymptotic behavior of solutions for a biharmonic equations

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Abstract – In this presentation, we consider the existence and asymptotic behavior of solutions for a biharmonic equations. The biharmonic equations is a type of evolution equations. Evolution equations, defined as partial differential equations where time t serves as one of the independent variables, emerge as fundamental constructs across various mathematical and scientific domains. They find applications not only within mathematics but also extend their influence into diverse fields such as physics, mechanics, and material science. For instance, equations like the Navier-Stokes and Euler equations, fundamental in fluid mechanics, delineate the dynamics of fluid flow, crucial for understanding phenomena ranging from airflow over an airplane wing to ocean currents. Similarly, nonlinear reaction-diffusion equations feature prominently in the study of heat transfer processes and biological phenomena, offering insights into the distribution of heat and the spread of substances within biological systems. In the realm of quantum mechanics, notable equations such as the nonlinear Klein-Gordon and Schrödinger equations play pivotal roles, elucidating the behavior of particles and systems at the quantum level, essential for grasping the fundamental principles governing the universe's smallest scales. These examples underscore the ubiquitous nature of evolution equations, serving as indispensable tools for modeling and comprehending complex phenomena across disciplines.

Keywords – Existence, Asymptotic Behavior, Biharmonic Equations, Nakao Inequality, Energy Identity.

Nonexistence of global solutions for a parabolic type Kirchhoff equation

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Abstract – In this presentation, we consider the nonexistence of global solutions for a parabolic type Kirchhoff equations. The parabolic type Kirchhoff equations is a type of evolution equations. Evolution equations, defined as partial differential equations where time t serves as one of the independent variables, emerge as fundamental constructs across various mathematical and scientific domains. They find applications not only within mathematics but also extend their influence into diverse fields such as physics, mechanics, and material science. For instance, equations like the Navier-Stokes and Euler equations, fundamental in fluid mechanics, delineate the dynamics of fluid flow, crucial for understanding phenomena ranging from airflow over an airplane wing to ocean currents. Similarly, nonlinear reaction-diffusion equations feature prominently in the study of heat transfer processes and biological phenomena, offering insights into the distribution of heat and the spread of substances within biological systems. In the realm of quantum mechanics, notable equations such as the nonlinear Klein-Gordon and Schrödinger equations play pivotal roles, elucidating the behavior of particles and systems at the quantum level, essential for grasping the fundamental principles governing the universe's smallest scales. These examples underscore the ubiquitous nature of evolution equations, serving as indispensable tools for modeling and comprehending complex phenomena across disciplines.

Keywords – Nonexistence, Kirchhoff, Parabolic-Type Equations, Multiple Nonlinearities, Energy Identity.

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Influence NaOH concentration and sample storage conditions on the mechanical properties of volcanic tuff-based geopolymers

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Abstract – Geopolymers are inorganic materials that are composed of alkali-activated alumina silicate Their favorable ecological impact, mechanical performance, and low thermal conductivity make them potential replacements for Portland cement (PC). Volcanic tuffs (VT) are an excellent source of reactive silica and alumina for synthesizing geopolymers. Despite VT's low reactivity compared to conventional precursors such as blast furnace slag, metakaolin, and fly ash, Previous research indicates that VT could be used as a precursor for geopolymer synthesis. The geopolymerization mechanism of VT is influenced by various factors, including the curing conditions (temperature, time, and humidity), the concentration, type, and silica modulus (SiO_2/Na_2O) of the alkaline solution, the chemical and mineralogical composition, the pre-treatment of raw materials, and the fineness/specific surface area of particles. This research presents the effect of NaOH concentration and sample storage conditions on the compressive strength of volcanic tuff-based geopolymers. The results show that 10 (mole) is the optimum concentration for the best mechanical properties. the sample storage method significantly affects compressive strength development, with samples sealed at room temperature at 10% humidity showing the best mechanical properties.

Keywords – Geopolymer, Volcanic Tuff, Storage Conditions, Naoh Concentration, Compressive Strength.

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Preparation and Characterization of PHBV/PLA Blend: Impact of Compatibilization and Surface Treatments of Diss Fibers

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Abstract – Polymers produced from renewable resources, known as poly (3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) and Polylactide (PLA). Because of their diverse properties, PHBV and PLA are prime candidates for a number of uses in the biomedical, food and other sectors. However, these biopolymers have a number of important limitations that prevent them from being used on a large scale, notably their fragility and high cost. For these biopolymers to be fully competitive with ordinary polymers, it seems necessary to improve these properties. Scientists have recently focused on blends of two or more polymers and/or the incorporation of natural fibers because of their low cost, low density and renewable, biodegradable qualities. Sustainable development, which allows the use of local resources, justifies the use of Diss fibers to reinforce composite structures. A Diss fiber has already been used in the construction of old houses because of its good mechanical properties. Biocomposites based on a PHBV/PLA blend and Diss fibers are promising materials, combining high performance with possible degradation at the end of their life. In this work, different series of biocomposites based on PHBV/PLA blend and Diss fibers (treated and untreated fibers) with and without PHBV-*g*-MA compatibilising agent (5 wt. %) were prepared by melt blending. The surface of the fibers was modified using alkaline treatment to improve interfacial adhesion between the fiber and the matrix. The thermal stability, water absorption capacity and mechanical behaviour of the biocomposites obtained were studied, and the results were compared with unmodified biocomposites and the pure blend.

Keywords – PHBV, PLA, Blends, Biocomposites, Diss Fibers.

The choice of the appropriate Gaussian mother wavelet

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***Abstract** –*Various mothers wavelets have been suggested for particular problems, like as the Gaussian, Mexican hat, and Morlet Wavelet. The choice of the appropriate wavelet mother depends on the type of information that we want to obtain from the signal. In our work, we propose the role of each order derivative of the Gaussian wavelet for signal analysis.

Keywords – Wavelet, Continuous Wavelet Transform, Morlet Wavelet, The Eighth Derivative of a Gaussian Wavelet, Signal Analysis

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Effects of Heat Generation/Absorption and Convective Boundary Conditions on Natural Convective Boundary-Layer Flow From a Vertical Plate Embedded in a Porous Medium Filled With a Nanofluid

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Abstract – This work is focused on the study of the natural convection boundary-layer flow over a vertical plate in a non-Darcy porous medium saturated with an incompressible nanofluid in the presence of heat generation or absorption, and under convective boundary conditions. The model used for the nanofluid includes the effects of Brownian motion and thermophoresis, while the Darcy- Forchheimer model is used for the porous medium. The governing partial differential equations are transformed into the ordinary differential equations using the similarity transformations. Many results are obtained and representative set is displayed graphically to illustrate the influence of the various parameters on different profiles. It is observed that the thermal transport is significantly affected by the varying values of the parameters related to the nanofluid in the medium as well as the Biot number due to the convective boundary condition. The heat, mass and nanoparticale mass transfer rate are reported under these effects.

Keywords – Non-Darcy Porous Medium, Nanofluid, Natural Convection, Heat Source, Convective Condition.

Yaşamsal Bulguları Gerçek Zamanlı Ölçebilen Bir Akıllı Tekstil Tasarımı

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Özet – Akıllı tekstiller, sensörler, mikroişlemciler, piller ve benzeri elektronik bileşenlerin çeşitli yöntemler (iletken iplik, iletken boya vb.) ile tekstil ürünlerine entegre edilmesi ile üretilmektedir. Bu sayede tekstil ürünleri manyetik, kimyasal, termal ve mekanik değişkenleri (sıcaklık, nem, kuvvet vb.) algılama fonksiyonu kazanırlar. Akıllı tekstiller, elektronik bileşen ve kumaş ara bağlantılarının işlevselliklerinden dolayı, geleneksel üretim yöntemleriyle elde edilemeyen esneklik ve konfor özellikleri gösteren sistemler olup, bu sayede spor giyim, medikal uygulamalar ve savunma endüstrisi gibi birçok alanda kullanılabilmektedir. Bu çalışmada, mikroişlemci kontrolünde çalışan üç eksenli açısal ivmeölçer modülü, nabız sensörü, ortam sıcaklığı, bağıl nem sensörü ve sıcaklık sensörü dokuma kumaşa iletken iplik ile entegre edilmiştir. Ölçüm sonuçlarının gözlenebilmesi için OLED ekran ve TCA9548A çoklayıcı modül kullanılmıştır. Bu sensörlerden alınan kalp ritmi, bağıl nem, vücut sıcaklığı ve hareket bilgisi işlenip ekran bileşenine yansıtılmıştır. Bu sistem aracılığıyla parametreler, bilgisayar bağlantısına ihtiyaç duyulmadan ölçülebilmiş ve kullanıcıya geribildirim yapılmıştır.

Anahtar Kelimeler – Akıllı Tekstiller, Sensörler, Mikroişlemci, E-Tekstiller, İletken İplikler

Unlocking Student Success: A Comparative Analysis of Business Intelligence and Analytics in Higher Education Institutions

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Abstract – Business intelligence (BI) and analytics have emerged as critical tools for enhancing student success and improving institutional effectiveness in higher education. This study presents a comparative analysis of BI and analytics deployment and perceptions across different types of higher education institutions, including publicly funded universities and private universities. In the study, data from the Educause Core Data Services (CDS) questionnaire are utilized, supplemented by data from the National Center for Education Statistics (IPEDS). The findings reveal significant variations in BI deployment and perceptions among institutions, with private universities demonstrating higher levels of institution-wide deployment compared to public universities. Despite widespread recognition of the importance of analytics for strategic planning and decision-making, funding constraints and faculty acceptance emerge as key challenges hindering analytics maturity. However, there is growing momentum toward leveraging BI and analytics to drive transformative change in higher education, with strong leadership commitment observed for developing institutional effectiveness through analytics. The study underscores the need for ongoing research and collaboration to address funding constraints, improve faculty engagement, and foster a culture of data-driven decision-making across the sector. By overcoming these challenges and seizing opportunities for innovation, higher education institutions can harness the power of BI and analytics to improve student success outcomes, enhance operational efficiency, and drive institutional excellence in the 21st century academic landscape.

Keywords – Business Intelligence, Analytics in Higher Education, Student Success, Comparative Analysis, Institutional Effectiveness

MPPT approach using walrus optimization algorithm for PV systems under variant operating conditions

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*Abstract –*A novel metaheuristic algorithm that has demonstrated exceptional strength and effectiveness in managing and resolving challenging issues is walrus optimization algorithm. In PV systems, particularly when there is partial shading, the photovoltaic array's power-voltage curve shows several peaks, only one of which is global. In order to solve this issue, this study presents a novel design for a maximum power point tracking controller based on arithmetic optimization for battery charging schemes using photovoltaic systems that are partially shaded. In order to effectively charge the battery by maximizing its charging current, the primary goal of the arithmetic optimization-based maximum power point tracking put forth here is to maximize the power extracted from the photovoltaic array under all types of climatic conditions. MATLAB simulations validate the feasibility and effectiveness of the proposed algorithm for MPPT. Additionally, its effectiveness is compared to other maximum power point tracking techniques, taking into account actual climatic conditions as well as uniform and partial shading scenarios. These techniques include particle swarm optimization, perturb and observe, and hybrids of grey wolf optimization and particle swarm optimization. The approach proposed performs well in terms of battery charging efficiency and its capacity to track the global maximum power point, according to simulation results.

Keywords – PV Systems, MPPT, Walrus Optimization Algorithm, Partial Shading Conditions, Battery Charging.

Electrocatalytic Nitrate Reduction to Ammonia Over Pt-Fe3O4 Supported on Ni Foam Nanocomposite

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Abstract – Effective and sustainable electrocatalytic reduction of nitrate is greatly desired to solve the problem of global water contamination and provide a promising way to generate fossil-free ammonia. In this regard, $Pt-Fe_3O_4$ nanoparticles are decorated on Ni foam (NF) using the hydrothermal method to achieve $Pt-Fe_3O_4$/NF nanocomposite electrocatalyst. Various characterization techniques investigate the structural and morphological properties of $Pt-Fe_3O_4$/NF nanocomposite. Benefiting from the small size of Pt and Fe nanoparticles, the $Pt-Fe_3O_4$/NF nanocomposite reveals excellent performance for electrocatalytic nitrate reduction with an NH_4^+ yield rate of 0.301 mmol h^{-1} cm^{-2} (5.418 mg h^{-1} $mg^{-1}_{cat.}$) and Faradaic efficiency of 80.7% at -0.8 V vs. RHE. $Pt-Fe_3O_4$/NF nanocomposite exhibits unique metallic properties and abundant surface sites due to a synergistic effect of Pt-Fe nanostructure favorable for the electrochemical and hydrogenation reduction processes. Moreover, $Pt-Fe_3O_4$/NF nanocomposite reveals outstanding long-term stability and durability. Isotope labeling experiments are performed, and results demonstrate that ammonia originates from nitrate reduction. These favorable outcomes of $Pt-Fe_3O_4$/NF nanocomposite emphasize its potential for treating nitrate wastewater for ammonia recovery and prospects for its industrial applications.

Keywords – $Pt-Fe_3O_4$/NF Nanocomposite; Electrocatalytic Reduction Reaction; Nitrate; Ammonia; Electrocatalyst

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Optimizing Solar Energy Harvesting: A Comparative Study of Polycrystalline and Monocrystalline Photovoltaic Panels in Skikda, Algeria

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Abstract – This article meticulously investigates the utilization of two distinct types of photovoltaic solar panels—polycrystalline and monocrystalline—within the specific climatic setting of Skikda, Algeria, aiming to conduct an extensive evaluation of their energy output and efficiency. The primary objective of this study is to ascertain the superior option between the two panel types, while also accounting for influential external factors such as solar radiation and wind speed. Through rigorous analysis, the findings subtly lean towards favoring monocrystalline panels over their polycrystalline counterparts.

Moreover, the research highlights the notable impact of varying solar radiation levels and wind speeds on the performance of both panel types. It is discerned that heightened solar radiation not only augments energy production but also enhances overall energy efficiency. Similarly, elevated wind speeds play a crucial role in facilitating cooling mechanisms, thereby contributing to increased electrical power generation for both polycrystalline and monocrystalline panels.

These insightful results hold significant implications for researchers and industry stakeholders, offering valuable insights into optimizing the utilization of solar energy resources. By shedding light on the nuanced interplay between different environmental variables and solar panel performance, this study paves the way for more effective harnessing of solar energy across diverse geographical and climatic conditions. Ultimately, these findings serve as a catalyst for driving innovation and sustainable practices in the realm of renewable energy utilization.

Keywords – PV Panels, Efficiency, Exergy, Energy, Energy Conversion

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Comprehensive Energy and Exergy Analysis of a Hybrid System for Green Hydrogen Production

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Abstract – This article employs energy and exergy methodologies to comprehensively model and assess hydrogen and electricity production and storage systems reliant on hybrid renewable energy sources. The study encompasses a thorough investigation of various subsystems, including solar photovoltaic panels (PV), wind turbines, proton exchange membrane fuel cells (PEMFC), inverters, electric analyzers, hydrogen storage systems, batteries, and loading systems. Through meticulous analysis, the interactions and efficiencies of each component within the hybrid system are evaluated to provide a holistic understanding of its performance.

A case study is conducted, focusing on a hybrid system that integrates renewable energy from both wind and solar power sources. Detailed results from this study are presented, shedding light on the effectiveness and potential challenges associated with such integrated systems.

Furthermore, environmental conditions play a crucial role in shaping the performance of these systems. With the environmental temperature set at 30°C and various dead condition temperatures ranging from 0°C to 30°C, the study explores the impact of temperature variations on energy efficiency.

Energy analysis uncovers the maximum efficiencies of wind turbines, solar photovoltaic panels, and electrical analyzers to be 26.15%, 9.06%, and 53.55%, respectively. Exergy analysis further refines these figures to 71.70%, 9.74%, and 53.60%, respectively.

This comprehensive analysis contributes valuable insights into optimizing hybrid renewable energy systems for green hydrogen production. It emphasizes the intricate relationship between environmental conditions and system performance, underscoring the importance of considering both energy and exergy aspects in achieving enhanced sustainability and efficiency.

Keywords – PV Panels, Efficiency, Exergy, Energy, Energy Conversion

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The Impacts of Environmental Factors on Biofilm Production by *Bacillus* Species Isolated from Cotton Rhizospheres

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Abstract – Biofilm mode of life is a survival strategy of microorganisms in unfavorable environments, therefore the treatments of biofilm-forming beneficial organisms to plants have attracted scientist' attention in recent years. The present study isolated 33 *Bacillus* strains from cotton rhizospheres and examined their biofilm-producing capacity under *in vitro* conditions with different salt, pH, and inorganic phosphate concentrations. Of the isolated strains, only 10 strains were resistant to 100 mM salt concentration. Such salt-resistant strains were also high-biofilm-producers and characterized as *Bacillus subtilis* and *B. thuringiensis* with Maximum likelihood and Bayesian analysis in MEGA11. *B. subtilis* BS2 and *B. thuringiensis* BS6/BS7 enhanced their biofilm production with increasing salinity but the other strains decreased biofilm formation (p < 0.05). In pH experiments, while some strains (like *B. subtilis* BS2 and BS3) increased biofilm production, the other tested isolates formed more amounts of biofilms under alkaline conditions. Increasing phosphate concentrations significantly reduced biofilm formation in all the strains tested (p < 0.05). In contrast to phosphate effect, NaCl and pH differently affected the biofilm-forming ability of *Bacillus* strains. Salt and pH stress increased the amounts of biofilms in some *Bacillus* strains, demonstrating the probability of *in vivo* biofilm formation by such strains on plant surfaces, especially under stress conditions.

Keywords – Biofilm, Bacillus, NaCl, pH, Phosphate, Cotton

The Use of GIS to Improve Accessibility of Green Spaces

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Abstract – Recreation service providers can enhance the development and management of their facilities using geographic information systems (GIS). The aim of this paper is to investigate the accessibility and analyze urban green space distribution and utilizing GIS techniques. The study explores the advantages of urban parks and their significance in urban environment. It examines the accessibility of urban parks, identifying underserved areas and populations. Additionally, the paper presents a novel approach by developing an automation tool to measure the accessibility of urban parks in different areas of the city. This plugin aims to provide a comprehensive assessment of park accessibility, allowing city planners and policymakers to make informed decisions about park development and allocation of resources. A case study of the park system in Tangier, Morocco, demonstrates the effectiveness of these techniques. Additionally, the paper briefly discusses various GIS applications for enhancing recreational services, highlighting their potential to improve agency efficiency and deliver higher quality services to the public.

Keywords – GIS, Urban Park, Green Space, Accessibility, QGIS

Impact Of The Integratıon Of Bıo-Materıals On The Physıcal And Mechanıcal Propertıes Of Raw Earth Brıcks

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Abstract – The use of raw earth bricks that incorporate bio-sourced materials, such as straw, hemp, or wood fiber, represents a significant stride toward sustainable and eco- friendly construction practices. By utilizing these renewable resources, construction processes can effectively reduce dependence on traditional materials, including cement, which is known to have a substantial environmental footprint primarily due to its energy-intensive production methods. Furthermore, the incorporation of bio-sourced materials in raw earth bricks can lead to notable improvements in the energy qualities of the bricks themselves. These enhancements often include increased thermal performance, improved insulation properties, and enhanced overall energy efficiency within buildings.

The findings of the study highlight the crucial role of incorporating bio-sourced substances, such as straw and sawdust, in raw earth bricks, emphasizing their positive impact on various key properties. The study demonstrates that the inclusion of straw and sawdust in the raw earth mixture acts as natural reinforcements, contributing to the strengthening and stabilization of the bricks. Despite the observed increase in absorption capacity and porosity, limiting the percentage of straw or sawdust addition enables the bricks to maintain their stability.

Keywords – Raw Earth Bricks, Bio Materials, Mechanical And Physical Properties.

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DFT investigations on the structural, electronic and thermoelectric properties of half heulser material :Insights into its potential application in photovoltaics

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Abstract – Half heusler materials have attracted considerable attention in recent years as promising candidates for various technological applications. In this work, we have investigated the structural, electronic, and thermoelectric properties of RbScSn using density functional theory. The exchange-correlation effects were addressed through the GGA approximation and the TB-mBJ potential. The band structure profiles of this compound reveal a semiconductor nature with a direct band gap of 0.43, 0.93 eV for GGA-PBE and TB-mBJ approximation respectively.

In addition, the thermoelectric properties were predicted via the semi-classical Boltzmann transport theory, as performed in Boltztrap code. The results obtained confirmed that the compound are very attractive for thermoelectric devices.

Keywords – Half-Heusler, Semiconductor, Thermoelectric Properties, Merit Factor, Renewable Energy.

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Asymptotic behavior of solutions for a parabolic type Kirchhoff equation

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Abstract – In this presentation, we consider the asymptotic behavior of solutions for a parabolic type Kirchhoff equations. The parabolic type Kirchhoff equations is a type of evolution equations. Evolution equations, defined as partial differential equations where time t serves as one of the independent variables, emerge as fundamental constructs across various mathematical and scientific domains. They find applications not only within mathematics but also extend their influence into diverse fields such as physics, mechanics, and material science. For instance, equations like the Navier-Stokes and Euler equations, fundamental in fluid mechanics, delineate the dynamics of fluid flow, crucial for understanding phenomena ranging from airflow over an airplane wing to ocean currents. Similarly, nonlinear reaction-diffusion equations feature prominently in the study of heat transfer processes and biological phenomena, offering insights into the distribution of heat and the spread of substances within biological systems. In the realm of quantum mechanics, notable equations such as the nonlinear Klein-Gordon and Schrödinger equations play pivotal roles, elucidating the behavior of particles and systems at the quantum level, essential for grasping the fundamental principles governing the universe's smallest scales. These examples underscore the ubiquitous nature of evolution equations, serving as indispensable tools for modeling and comprehending complex phenomena across disciplines.

Keywords – Asymptotic Behavior, Kirchhoff, Parabolic-Type Equations, Komornik Inequality, Global Existence.

İşletmelerdeki Moral-Motivasyonun Verimliliğe Etkileri

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Özet *–* İşletmeler, personelinin moral motivasyonunu en üst seviyede tutarak iş organizasyon yapılarında ki iş gücü verimliliğini artırmayı amaçlamaktadırlar. Yoğun yaşanan küresel pazar rekabeti ve müşterilerden gelen devamlı değişim istekleri işletmeleri performans yükseltmeye, maliyetlerini düşürmeye ve kaliteli ürünler üretmeye yönlendirmektedir. İşletmeler maliyetleri düşürebilmek, verimliliklerini ve performanslarını artırabilmek için üretim planlama süreçlerinde personel iş gücünü en iyi şekilde değerlendirip ürün kalitesini artırmak ve sürdürülebilir hale gelmek istemektedirler.

İşletmelerde, güdüleyici faaliyetlerin net olmaması durumunda, çalışanların performansı doğal olarak yetersiz olabilmektedir. Bu çalışmayla ilgili işletmedeki performans faktörlerinin neler olduğu analiz edilerek eksikliklerini belirlemeyi ve olumlu yönlerin artması içinde öneriler sunmak amaçlanmıştır. İşletmede ki sosyal teknik faaliyetler durumunu belirlemek için anket uygulanmış ve veriler toplanmıştır. Çalışma sonuçlarına göre; analiz edilen işletmenin performans sağlamada ki iş gücü oranın yetersiz kaldığı, iş akış sistemlerinde moral motivasyonun orta seviyede olduğu ve sosyal etkinliklerin yetersiz olduğu görülmektedir.

İşletmeler, rekabetçi avantajlarını koruyabilmek ve ayakta kalabilmek için müşteri memnuniyetini maksimum seviyeye çıkarmakla kalmayıp, aynı zamanda çalışanlarının moral ve motivasyonunu da ön planda tutmalıdır. Sürdürülebilir tüm işletmelerin, bu gerçeği göz önünde bulundurarak çalışanlarını önemsemesi onların sosyal bir varlık olduğunu göz ardı etmeden faaliyetlerini devam ettirmesi gerekmektedir.

Anahtar Kelimeler – Güdülenme, İşletme, İş Gücü, Motivasyon, Sürdürülebilirlik, Verimlilik.

DFT Insight into Structural, Electronic, Optical and Thermoelectric Properties of Novel Eco-Friendly Full Heusler alloys for Green Energy Generation

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Abstract – In this comprehensive study, we have employed density functional theory (DFT), specifically the full-potential linearized augmented plane wave (FP-LAPW) method, in conjunction with the generalized gradient approximation (GGA), to thoroughly investigate the structural, electronic, and thermoelectric properties of novel full Heusler alloys. These alloys, known for their potential in spintronic applications and renewable energy solutions, are characterized by the chemical formula X2YZ. Our DFT calculations, facilitated by the WIEN2k computational framework, reveal that these full Heusler alloys crystallize in cubic structure, with lattice parameters that vary depending on the specific composition of the alloy. The electronic structure analysis indicates that these materials exhibit semiconductor nature, with a low band gap. This unique electronic property makes them highly suitable for optical devices. To further assess their suitability for green energy applications, we have explored their thermoelectric properties using the semiclassical Boltzmann transport theory implemented in the BoltzTraP code. The results demonstrate that full Heusler alloys possess high electrical conductivity alongside relatively low thermal conductivity, a combination that is highly sought after in thermoelectric materials. This leads to a substantial Seebeck coefficient and a high figure of merit (ZT) over a broad temperature range, suggesting their potential as efficient thermoelectric materials. The integration of these materials into solar cell technology could significantly enhance efficiency by utilizing their ability to convert waste heat into electrical energy, thereby contributing to the development of more sustainable energy systems. Our findings underscore the versatility of full Heusler alloys and their promising role in the advancement of renewable energy technologies.

Keywords – Full Heusler, Density Functional Theory, Electronic Properties, ZT Coefficient, Thermoelectric Properties.

Effect of Electron Transport layer On The Performances of Organic Solar Cells

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Abstract – Solar energy stands out as the most promising source of green energy, with undeniable practical advantages in this field. Exploring the impact of interfacial layer thickness on bulk heterojunction (BHJ) solar cell architectures is a key research objective. In this study, we focus on the influence of the thickness of the ZnO cathode layer, used as an electron transport layer (ETL), on cell performance. We have modelled the device according to the following structure: ITO/PEDOT:PSS/P3HT:PCBM/ZnO/Ag, varying the thickness of the ZnO layer from 13 nm to 100 nm. We used SCAPS-1D software to simulate the performance of the solar cells.

The main parameters decrease with increasing layer thickness. Current density increases from 7.89 to 10.70 (mA/cm2), Voc increases from 0.439 to 0.672 (V), a decrease of 35%. The fill factor fell from 72.34% to 60.28%, while the conversion efficiency increased from 2.34% to 4.88%. The best performance was observed for a ZnO thickness of 20 nm. However, increasing the thickness of the interfacial layer led to a decrease in efficiency and other parameters. These results are in good agreement with those reported in the literature.

Keywords – Organic Solar Cell, Thickness, Performances, SCAPS 1D, Electron Transport Layer

Modeling and optimizing dye adsorption on kaolinite

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Abstract – In order to provide a viable and effective adsorbent for the removal of dye from aqueous solutions, a novel environmentally friendly kaolinite–cellulose (Kaol/Cel) composite was created for this work. X-ray diffraction, Fourier-transform infrared spectroscopy, scanning electron microscopy, energy-dispersive X-ray spectroscopy, and zero-point of charge (pHpzc) were used to examine its properties. Through examination of the key influencing parameters, dye adsorption on the composite was improved through the application of the Box-Behnken design. The best isotherm and kinetic models that fit our data were the pseudo-second-order kinetic model and the Freundlich model.

Keywords – Kaolinite, Adsorption, Dye, Isotherm.

Diosgenin loaded nanoparticles ameliorate adjuvant induced arthritis through moderation of inflammatory and oxidative stress biomarkers

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Abstract – This research work was designed to develop efficient Diosgenin (DGN) loaded biodegradable nanoparticles (DGN-NPs) for treating rheumatoid arthritis. The DGN-NPs were synthesized by ionic-gelation method using chitosan as a biodegradable polymer and *in-vitro* release study was performed followed by kinetics study. DGN-NPs had an average size of 290 nm, zeta potential of +11.5 mV with 72% entrapment efficiency, and PDI of 0.398. XRD analysis of DGN-NPs indicated the crystallographic nature while SEM analysis showed the spherical morphology and smooth surface. The anti-arthritic potential of DGN-NPs was investigated by injecting 0.1 ml Complete Freund's adjuvant in the left hind paw of Wistar rats on day 1 while oral therapy with DGN 15 mg/kg, and DGN-NPs at 5, 10, and 15 mg/kg was carried daily. Methotrexate (1 mg/kg) served as standard and was started on day 8 and continued till the 28th day by oral route. The DGN-NPs notably ($p < 0.05$-0.0001) reduced paw edema, pain, arthritic scoring, and improved body weight in contrast to DGN and standard therapy. The oxidative stress biomarkers were restored by GDN-NPs in the liver and sciatic nerve homogenates along with restoration of altered blood parameters as compared to disease control. Treatment with DGN-NPs notably downregulated NF-κβ, IL-6, IL-1β, COX-2, and TNF-α while upregulated IL-4 in contrast to disease control which resulted in the improvement of the histological lesions in ankle joints. It can be inferred from the current study that DGN-NPs especially at 15mg/kg exhibited notable anti-arthritic, and analgesic activity in contrast to DGN.

Keywords: Rheumatoid Arthritis; Diosgenin-Loaded Chitosan Nanoparticles; Ionic-Gelation Method; Complete Freund's Adjuvant; Analgesic

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Holocene Distribution of Boraginaceae Plants in Central Albania.

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Abstract – The Holocene data on fossil pollen reported in this scientific research were obtained from the subsurface investigation of the ancient city of Elbasan, in Central Albania. This study presents information on the evolutionary trajectory that members of the Boraginaceae family have followed throughout time. Based on archaeological research done in the Elbasani underground, the historical era stated corresponds with the New Holocene. The primary goal of this work is to demonstrate a connection between the historical dispersal of ancient pollen from Boraginaceae plants. Information on the fossil pollen of the Boraginaceae family is released for the first time. Between January and March of 2024, the data were examined.

Based on information gathered from the chemical and statistical examination of the fossilized pollen of Boraginaceae plants, we have discovered some intriguing findings. For instance, regardless of the depth to the surface, we have discovered palynomorphs of the Boraginaceae family in all examined soil samples. Furthermore, 815 fossil pollens have been identified and found, demonstrating both a consistent presence and a rising tendency in their amount from the earth's depths towards its surface.

Upon a thorough analysis of both domestic and international literature, no important variables have been identified as influencing the flora of Central Albania. We think that human engagement in the development of plants and fruit trees is required for it, based on the data obtained is mostly to blame for the vegetation's alterations throughout time in the area under study.

Keywords – Fossil Pollen, New Holocene, Boraginaceae, Soil Samples, Elbasan.

Underground Distribution of Heavy Metals in Central Albania.

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Abstract – The scientific study provides information on the heavy metal concentrations found in the Middle Albanian city of Elbasan's subterranean levels. We can draw a significant conclusion from the data if heavy metal concentrations are high enough to be regarded as contributing contributors to soil contamination. This work's main goal was to demonstrate any potential links between chemical soil contamination and pollution, which has a negative influence on public health.

Five soil samples that were obtained in March 2024, down to a depth of 0.5 m, were served to achieve this target. We draw attention to the fact that Elbasan City has been implicated in serious soil, water, and air chemical pollution throughout the years.

We were able to collect findings from the statistical analysis of the data that provide information on chemical components that may be implicated in soil contamination.

In conclusion, we find a chemical pollution of the soil from the element nickel, which is present in an amount approximately 2.5 times more than the standards defined by the EU Regulatory Acts. This is based on a qualitative analysis of the results compared to the permitted pollution rates from the EU.

According to our assessment, the identified contamination of the Elbasani soil is primarily caused by agricultural farmers' improper use of chemical and organic fertilizers, and primarily abusive behavior by light and heavy industries operating in the city.

Keywords – Heavy Metal, Soil Contamination, Nickel, Industries, Elbasan City.

Impact of Ionic Strength on Acidic Textile Dye Removal by Positively Charged Activated Carbon: Experimental Investigation and Theoretical Interpretation

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Abstract – The textile industry, characterized by its extensive use of chemicals, produces huge volume of wastewater laden with dangerous pollutants such as, dyes, pigments and salts. Among these pollutants, acidic dyes, particularly prevalent in dyeing and bleaching processes, pose significant environmental concerns. Their frequent detection in water bodies raises potential threats to both human and ecological safety. Thus, it's imperative to implement efficient wastewater treatment protocols to ensure that the discharge from this industry does not pose environmental hazards.

Given that textile wastewater contains a considerable amount of salts alongside colorants, the main objective of this study is to investigate the effect of textile wastewater salinity, known as ionic strength, on the removal of an acidic dye as a model pollutant by adsorption using a commercially available adsorbent positively charged in a highly acidic pH medium, and to optimize the operational conditions for enhancing the adsorption removal rate.

The investigation is conducted under consistent process parameters at ambient conditions. The results underscore the pivotal role of ionic strength in determining the removal of this dye. Notably, an increase in the ionic strength of the dye solution correlates with a substantial increase in its removal rate. The percentage removal is observed to be notably high within the highly acidic pH range at the initial stage of contact time. All adsorption experiments are conducted within a batch adsorption study, ensuring the utilization of optimal process parameters.

Keywords – Adsorption, Activated Carbon, Textile Wastewater, Acidic Dyes, Ionic Strength,

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The characteristics Measurement of the BOG (Boil Off Gas) propane reliquefaction section in the GP1/Z complex

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Abstract – The GP1/Z complex is one of the units producing propane, butane and butane propane mixtures (bu pro). It has two recovery sections, one to recover butane vapors and the other to recover propane vapors called the propane reliquefaction section (B.O.G).

In the propane reliquefaction section (B.O.G), the presence of light gases (methane and ethane) causes a great problem in the compression because they are uncondensable under the operating parameters of the GP1/Z unit.

These two gases induce the increase of the pressure in the propane storage tanks at low temperature.

In this context, our study consists in minimizing, via the HYSIS software, the rate of these gases in the storage trays and to consider solutions to make this section work in the exploitation standards.

Keywords – GP1/Z Complex, Section (B.O.G), Reliquefaction, Gases, HYSIS Software.

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Artificial Intelligence to Predict the Scattering Coefficient of Blood

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Abstract – the optical properties of blood have an influence and considered as an important parameter in in medical diagnostics and laser medicine due to its strong correlation with the pathophysiology of defferent diseases. However, few studies exist on direct measurements of the scattering coefficient of blood have been reported, and neither of them are compatible due to the measurement difficulties and heterogeneity of the blood. Furthermore, obtaining the scattering coefficient via an experimental approach is quite laborious. In this work, we present a rapid and accurate strategy to predict the scattering coefficient of blood using Dragonfly Algorithm- Support Vector Machine based on 1000 training and testing sets were selected for all the input parameters of wavelength, hematocrit percentage, and the oxygen saturation in building the model. The performance of the proposed (DA-SVM) is distinguished by high precision shown in the correlation coefficient of 0.9996 and 0.9957 for training and testing results, respectively, and low estimated errors values of RMSE 0.8484 and 2.9193 for training and testing phases, respectively, this result showed a strong match with the experimental data. The developed DA-SVM model also provide a reliable reference for future studies on optical properties of human blood.

Keywords – Dragonfly Algorithm; Artificial Intelligence; Support Vector Machine; Blood; Scattering Coefficient

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MorphoBiometric characterization and genetic biodiversity of Local Chicken in Algeria

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Abstract – This research paper presents a study on the genetic diversity and morpho biometric characterization of local breeds of chicken in Algeria. We looked at 250 local chickens (200 hens and 50 roosters) from 17 wilayas in three different bioclimatic regions of Algeria: the plain, mountain, highland, littoral, and Sahara. Measurements of the tail, breast, comb, central toe, and phenotypical examination of the animal, including its feather, skin, eye, shank, earlobe shape, and color, are all part of the morpho biometric characterization process. These analyses can offer crucial information about the animal's genotype and adaptability. Despite the significance of this subject, little research has been done on Algerian indigenous chicken's morpho-biometric characterization. These animals were the focus of an ethnological analysis using morphological measurements (10 body measurements), phenotypic characteristics (10 variables), and an analysis of their zootechnical performance (5 variables). Our results shows that the most common phenotypic characteristics. Additionally, The study found a correlation between the ecotype of the Algerian regions and the phenotypic characteristics of local chicken. In essence, the phenotypic features of the chicken may change depending on where it belongs, which might affect its resilience and adaption to diverse conditions. This discovery highlights the importance of considering regional differences in the breeding and management of local chickens in Algeria and can inform efforts to improve the productivity and sustainability of local chicken farming in the country the average length Regarding gender differences, there is a significant difference in the frequency of different phenotypic characteristics between males and females.

Keywords: Genetic Biodiversity; Local Chicken, Bioclimatic, Morphometric Characterization

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Thickness dependent physical and photocatalytic performances of zinc oxide thin films deposited by SILAR approach

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Abstract – In this novel study, we synthesized Zinc oxide thin films using the successive ionic layer adsorption and reaction (SILAR) process with different numbers of deposition cycles (10, 20, and 50 cycles). We investigated how the surface thickness of the films affects their structural properties, surface morphology, optical characteristics, and photocatalytic performance in degrading Methylene Blue (MB) dye. Energy dispersive X-rays (EDX) analysis confirmed the presence of zinc (Zn) and oxygen (O) elements. X-ray diffraction (XRD) patterns indicated the polycrystalline nature of the ZnO thin films, with larger crystallite sizes observed as film thickness increased. Scanning electron microscopy (SEM) images showed that thicker films resulted in the formation of hexagonal nanorod arrays. Atomic force microscopy (AFM) images demonstrated that surface roughness increased with film thickness, leading to an enhanced specific surface area. UV-visible transmission spectra revealed that increasing film thickness led to a wider band gap, ranging from 3.15 eV to 3.31 eV, accompanied by reduced optical transmittance. Photocatalytic experiments indicated that thicker films exhibited improved photocatalytic efficiency compared to thinner ones.

Keywords – Pure ZnO; Film Thickness; Nanoparticles; Photocatalysis; Degradation

QSAR Grey Wolf-Support Vector Machine for Regression Modeling Acute Oral Toxicity of Pesticides on Rats

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Abstract – Recently, researchers worldwide have expressed increasing concern about the increasing levels and diversity of contaminants in ecosystems, with pesticides being among the most notable contaminants, leads to toxicity in non-target species, including humans and animals, as well as to beneficial organisms in agricultural ecosystems. The excessive or inappropriate use of pesticides can lead to problems such as resistance of pests to chemicals, contamination of soil and water, and loss of biodiversity. Among the various methods used to assess pesticide toxicity, modeling and prediction of acute oral toxicity in rats has gained popularity due to its efficiency and accuracy. The objective of this study was to predict the acute oral toxicity (LC50) of pesticides on rats from QSAR models using machine learning models {Support Vector Machines for Regression (SVMr)} optimezed by Grey Wolf algorithm. The data set of 330 pesticides was retrieved from Pesticide Properties DataBase (PPDB). The descriptors were calculated by PaDEL-Descriptor and the best set of 12 descriptors was selected using Genetic Algorithm. The Grey Wolf-SVMr model outperformed the SVMr model with a determination coefficient R^2 of 0.92 and a RMSE equal to 0.23. These results demonstrate the improved performance of SVMr for regression when the hyper-parameters are optimized using Grey Wolf to predict the acute oral toxicity of new pesticides on rats.

Keywords – Pesticides Acute Oral Toxicity, Rats, QSAR, Grey Wolf-SVMr, Prediction.

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Stereochemical study and Molecular Docking of Some Fluoroquinolones Antibiotics Via Polysaccharides as Chiral Selector

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Abstract – Today in our pharmacies are a lot of developed drugs possess chiral centers, chirality has become increasingly important topic issue in drug research and has attracted increasing consideration in the pharmaceutical industry. The main objective of this work is to applied a simple direct isocratic high-performance liquid-chromatographic methods for chiral separation and determining the enantiomeric purity of some fluoroquinolones antibacterials drugs using (Chiralcel® OD-H) as chiral stationary phase, and online coupled with electronic circular dichroism (ECD) detector. The correlations of experimental ECD traces with quantum chemical ECD calculations with TD-DFT made it possible to elucidate the absolute configuration for each enantiomer, and establish the elution order. Furthermore, molecular docking was performed to confirm of absolute configuration, elution order and analyse the binding modes of R- and S-enantiomers. Moreover, the stereoselective and the chiral recognition mechanism of racemic fluoroquinolones antibacterials drugs on Chiralcel® OD-H chiral stationary phase (CSP) has also been researched via modeling studies. It was observed that hydrogen bondings and π-π interactions are the major forces for chiral separation. The modeling studies indicated strong interactions of R-enantiomers with Chiralcel® OD-H chiral selector than S-enantiomers. This process was found to be suitable for rapid enantiomeric purity analysis and a quality control of quinolones in any matrices also racemic compounds.

Keywords – Antibiotic, Fluoroquinolones, HPLC, Polysaccharides Csps, Docking, Chiral Separation.

Hepatitis C virus infection in children: a healthcare-associated infection

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Abstract **–** Hepatitis C virus remains a public health concern in our country. Few studies have focused on children. The aim of this article is to highlight the main modes of transmission of this virus in children and adolescents.

To investigate risk factors for HCV infection, we conducted a retrospective review of medical records from children and adolescents diagnosed with hepatitis C based on positive serology.

Among the 60 medical records we collected, 32 patients were under 10 years old, while the remaining 28 patients were 10 years old or older. Only 4 patients had no particular pathological medical history.

The following risk factors were identified: blood transfusion (43 cases: 71.7%), surgical procedures (29 cases: 48.3%), endoscopic exploration (5 cases: 8.3%), hijama (3 cases: 5.0%), vertical transmission (2 cases: 3.3%).

This study confirms that hepatitis C infection in young children in our country is primarily caused by iatrogenic factors. Only four patients in this study did not contract the virus through blood transfusions or invasive medical procedures. This highlights a significant public health concern, particularly in developing countries. Combating this issue remains crucial for preventing hepatitis C in children. Early infection can lead to the rapid development of cirrhosis later in life.

Keywords – Hepatitis C Virus; Children; Adolescent; Healthcare-Associated Infection; Transmission.

Exploring the anticorrosive potential of choline chloride-based deep eutectic solvents in synergy with corrosion inhibitors for enhanced metal protection

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Abstract – This thesis undertakes a pioneering exploration into the realm of corrosion science, focusing on the collaborative potential of choline chloride-based deep eutectic solvents (DESs) and novel Schiff base (SB) as corrosion inhibitors. The research aims to elevate metal protection strategies by synergistically leveraging the distinctive properties of DESs and the corrosion inhibition capabilities of SB. Beginning with a comprehensive introduction to DESs, elucidating their composition, properties, and multifaceted applications, the narrative seamlessly transitions towards the unique synergistic potential of DESs when combined with SB compound for inhibiting corrosion processes on various metal surfaces. The study delves into the mechanisms of traditional corrosion inhibitors, emphasizing the challenges inherent in conventional approaches. Subsequently, the focus shifts to the promising attributes of DESs and SB inhibitor, with an anticipation of overcoming the limitations encountered by traditional inhibitors. The investigation further scrutinizes the specific mechanisms of metal corrosion, setting the stage for an in-depth analysis of corrosion inhibition studies involving DESs and SB on selected metals. This thesis aims to contribute novel insights by intertwining the principles of DESs and SB with corrosion science. The anticipated outcomes of this research hold promise for advancements in sustainable and efficient anticorrosive strategies, with potential applications across diverse industrial sectors.

Keywords – Deep Eutectic Solvents, Corrosion Inhibition, Metal Protection, Synergistic Approaches, Sustainable Anticorrosive Strategies.

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PRE-DIAGNOSIS EVALUATION OF MENTAL DISEASES FROM EEG SIGNALS VIA ARTIFICIAL INTELLIGENCE METHODS

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Abstract – Detection of psychiatric disorders have been very common and challenging among pyschiatric and artificial intelligence communities. There are different types of problems related to the psychiatric disorders. A lot of studies have been identified to detect mental disorders from neuroimages and EEGs in literature. In this study, a hybrid method that includes Artificial Intelligence models of Machine Learning and Deep Learning methods for multi-class mental disorder case detection is achieved with using a publicly available EEG database. In this study, we used 50 different subjects for each type of disorders which have been diagnosed as Major Depressive Disorder (MDD), Autism Spectrum Disorder (ASD), Schzophrenia (SZ) and healthy. Indeed, additional feature extraction methods with some parameters are used for Machine Learning method of Support Vector machine (SVM) and, modified versions of CNN (Convolutional Neural Network) and ResNet18 Deep Learning methods are used and all results are compared in detail. For three class classification of psychiatric diseases, the accuracy, specificity, sensitivity and ROC results are obtained as the highest accuracy for modified ResNet18 model as %95.5 with the average prediction time of 22.38 min. Moreover, this study can give an important subject for eliminate the rate of manual interventions, making the models efficient for doctors to pre-diagnose during the clinical progress for neurologists and other related clinicians.

Keywords – EEG, SVM, CNN, ResNet18, Feature Extraction, Classification

Nonextensive statistical effects on the sound velocity in the quark-gluon plasma

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Abstract **–** In the present work, we determine the effects of Tsallis parameter q on the sound velocity in quark-gluon plasma for the thermal Deconfinement Phase Transition (DPT) from a hadronic gas phase consisting of massive pions to a Quark-Gluon Plasma phase containing gluons, massless up and down quarks and massive strange quarks within the bag model, using the nonextensive statistical (Tsallis statistics). In this work, we examine the behavior of the sound velocity square with temperature and Tsallis parameter q, at vanishing chemical potential.

Keywords – Deconfinement Phase Transition, Quark Gluon Plasma, Sound Velocity, Tsallis Statistics

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Natural convection study in closed square cavity with partial heated wall

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Abstract – Natural or forced convection occurs in several applications such as industry, the environment, electronics, etc. In this work we present a study by numerical simulation of natural convection in a closed rectangular cavity whose vertical walls are thermally insulated and the upper part at a cold temperature of 300 °K, the lower part of the cavity has a wall of which one part of this wall is heated. The aim of this study is to better understand the diffusion of heat in this cavity subjected to thermal constraints. The method used for solving the differential equations which govern the phenomenon of heat and fluid transfer is the finite element method with using of a CFD calculation code. The study allowed us to obtain numerical results while plotting the profiles of the velocity and temperature fields for different Rayleigh numbers between 10 and 10^6. The results obtained by the numerical simulation are discussed and analyzed.

Keywords –Natural Convection, Rectangular Cavity, Closed Cavity, Convection In Cavity

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Numerical Study of Magneto-Double-Diffusive Natural Convection of a Nanofluid Flowing in a Concentric Annular Space

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Abstract – The investigation of natural convection in nanofluid-filled concentric annular spaces has become a focal point due to its relevance across various engineering applications. This research delves into the numerical analysis of magneto-double-diffusive natural convection within such setups. The nanofluid, comprising nanoparticles dispersed within a base fluid, experiences thermal and solutal buoyancy forces in addition to a transverse magnetic field. Utilizing finite volume methods, the governing equations encompassing mass, momentum, energy, and species conservation are solved numerically. Through this study, the impact of crucial parameters like nanoparticle volume fraction, Rayleigh number, Hartmann number, and Lewis number on flow dynamics and heat transfer properties is examined. Findings reveal intricate fluid flow patterns and notable enhancements in heat transfer rates owing to nanoparticle presence and magnetic field influence. Furthermore, the study explores the influence of various parameters on Nusselt number distribution. By shedding light on the behavior of magneto-double-diffusive natural convection in nanofluid-filled concentric annular spaces, this research offers valuable insights for optimizing thermal management systems and designing advanced heat exchangers.

Keywords –Magneto-Double-Diffusive, Natural Convection, Nanofluid, Hartmann Number

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Productivity, feed quality and capacity of *Thymuseta-Stipetum-Festucosum* formation (Azerbaijan)

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Abstract - The vegetation cover of the formation was recorded in the summer pasture (grazing) area of Yardimli district No. 3 "Yaharyurd" on the mountain-grassy steppe soil, and the productivity was determined here. Depending on the terrain, soil and climate of the area, its productivity varies from year to year. The average perennial air temperature in the region is usually 11.90C and the amount of precipitation reaches 645 mm.

In order to determine productivity in Thymuseta-Stipetum-Festucosum phytocenosis, the approximate coefficient of conversion of wet grass mass to air-dry edible mass and vice versa fluctuated in the range of 2.3-2.6. The research results show that the three-year average yield of Thymuseta-Stipetum-Festucosum formation was 15.6-24.0 s/ha (wet) and 6.5-9.6 s/ha dry mass. Based on the above, 44.7 units of feed and 4.9 digestible proteins are obtained per 100 kg of feed, according to the feed quality of the formation, including its nutritional value.

Average annual yield of Thymuseta-Stipetum-Festucosum formation (8.1 s/ha), feed unit per 100 kg of dry fodder (44.7 kg), duration of pasture vegetation (120 days) and daily feed of small horned cattle or cattle it allows to determine the load of the pasture area (2.3 head of cattle per hectare) and the capacity (766 heads of cattle) in summer pasture area No. 3 (on 333 ha) provided that the norm of 1.3 fodder units is accepted.

Keywords- Protein, Pasture Capacity, Livestock, Productivity, Pasture Area

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ÇEŞİTLİ OTLAR VE BAKLAGİLLER İÇEREN SUBALPİN ÇAYIR OLUŞUM SINIFI (AZERBAYCAN)

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Özet - Bu formasyon sınıfı *Stachysetum – Trifoliosum* ve *Alchemiletum – Amoriosum* formasyon gruplarından oluşmaktadır.

Araştırmada *Stachysetum – Trifoliosum* formasyon grubunun *Stachysetum macrantha – Trifoliosum repens* birlikteliğinden, *Alchemiletum – Amoriosum* formasyon grubunun ise *Alchemiletum amicta – Amoriosum fontanum* birlikteliğinden oluştuğu belirlendi.

Stachysetum - Büyük Kafkas Dağları'nın *Trifoliosum* oluşum grubu Güneybatı yamacında yer alan Balakan ilçesi topraklarında deniz seviyesinden 2865 m yükseklikte Temmuz 2022-2023'de kaydedilmiştir.

İncelenen *Stachysetum-Trifoliosum* formasyonunun tür kompozisyonu çok zengin olmayıp, 21 tür ile temsil edilmektedir. Burada yaşam formlarına göre tüm türler çok yıllık otlardır. Ekolojik gruplara göre başlıca 8 türün (%38,1) kserofit, 3 türün (%14,3) mezokserofit, 9 türün (%42,8) mezofit ve 1 türün (%4,8) hidrofit özelliğinde olduğu belirlendi.

Bu formasyonun baskın bitkisi *Trifolium repens* L. Presl olup bolluğu 2-3 puan, alt baskın bitkisi *Stachys macrantha* C. Koch olup bolluğu 2 puan olarak tahmin edilmiştir.

Özellikle *Alchemiletum-Amoriosum'un* dominantı olan *Trifolium fontanum* Bobr'ın bolluğu 2-3 puan, subdominant *Alchemilla amicta* Juz'un bolluğu ise 2 puan olarak tahmin edilmiştir.

Yapısına göre fitosinoz iki aşamalıdır. Yani, birinci katta - *Stachys macrantha*, *Trifolium repens*, vb. II. katta *Alchemilla sericea*, *Scabiosa caucasica*, *Astragalus resupinatus* vb. bulunur. Toplam proje kapsamı %40-60 arasında değişmektedir.

Anahtar Kelimeler- Formasyon, Kserofit, Mezofit, Mezokserofit, Hidrofit.

Electrochemical behavior of Mg alloy AZ31 in 0.9 % NaCl medium

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Abstract – Magnesium (Mg) alloys are novel class of metals, which currently acquire attention from biomaterials. Magnesium alloys are metallic biomaterials that can be biodegradable in the body fluids. It is vital to understand main characteristics about metallurgy and corrosion of Mg alloys. Investigating of magnesium corrosion has always been a challenge. In this study, the corrosion resistances of the Mg alloys were evaluated in aqueous NaCl solution. The corrosion behavior of Mg alloys was performed in by electrochemical techniques. Such techniques are the open circuit potential measurements, potentiodynamic polarization, and electrochemical impedance measurements. The characterization of the corroded surface was carried out by means of microscopic examination and hardness measurements. Mg alloys presents low corrosion potential, they are sensitive to chloride ions and can be degraded in the Cl^- containing human body environment.

Keywords – Biodegradable Implants, Electrochemical Techniques, Magnesium Alloys, Chloride Ions

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Analysis of the parasitic phenomenon of the Barbel *Luciobarbus callensis* in fresh waters in Algeria: Case study of the areas of Oued Mzi (Laghouat) and the Seboula dam (M'sila)

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Abstract - The Barbel, also known scientifically as *Luciobarbus callensis*, is a type of freshwater fish widely distributed in Algeria. This fish, which belongs to the Cyprinidae family, in addition to its recreational appeal plays a crucial role in the country's aquatic ecosystems, especially in rivers, lakes and dams.

As part of our research, we analyzed 224 digestive tubes of the fish *Luciobarbus callensis*, from two distinct sites: Oued Mzi (Laghouat) and the dam of Seboula (M'sila). We then examined these digestive tubes using a binocular and optical microscope to observe the various parasitic taxons present, and to identify them, we consulted appropriate identification guides.

Following the analysis of the stomach content, several significant results were obtained, we found two species of parasites, *Hysterothylacium sp* and *Bothriocephalus acheilognathi*, where the presence of *Hysterothylacium sp* was observed in all samples of the two study stations during all seasons as well as for both sexes. On the other hand, the *Bothriocephalus acheiloagnathi* marked its presence only in females and that during the summer in Oued Mzi, as for the dam of Seboula its Presence was recorded during the winter and summer and for both genders.

Keywords - Luciobarbus Callensis, Oued Mzi, Barrage De Seboula, Hysterothylacium Sp, Bothriocephalus Acheilognathi.

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Enhancing Nanoparticle Synthesis Through Deep Learning and Scanning Electron Microscopy: Optimization and Experimental Validation

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Abstract – This work presents a new method for creating nanoparticles by combining deep learning concepts with conventional synthesis procedures. By utilizing convolutional neural networks (CNNs) and knowledge gained from prior research, the methodology seeks to enhance and simplify the process of synthesizing nanoparticles. The training data for the deep learning model consists of a dataset that includes synthesis parameters such as precursor concentrations, reaction temperatures, and times. The model acquires knowledge of the intricate connections between these parameters and the features of nanoparticles. Through the utilization of a wide range of synthesis data, the algorithm is capable of discerning patterns that result in the desired attributes of nanoparticles. Experimental validation entails the production of nanoparticles according to the model's suggestions and their subsequent characterization using techniques such as scanning electron microscopy (SEM) and X-ray diffraction (XRD). This novel methodology has the capacity to forecast the most favorable conditions for synthesis, diminish the need for trial-and-error experimentation, and expedite the advancement of customized nanoparticles, so transforming the field of nanoparticle synthesis.

Keywords – Nanoparticle Synthesis, Deep Learning, Optimization, Experimental Validation

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A novel Design of Dielectric Resonator Antenna at 2.45 Ghz for ISM Applications

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***Abstract** –* Due to technological advances, dielectric resonators antennas (DRA) have received an extensive interest   for wireless communication applications. In this paper, a simple rectangular dielectric resonator antenna (RDRA) for ISM applications is proposed. The designed DRA operates at ISM frequency band covers the $2.45\ GHz$. Our RDRA antenna is printed on plastic substrate, which has a thickness of $1.575\ mm$ with a relative permittivity εr of 2.65, and a dielectric loss tangent of 0.025. the proposed RDRA is fed using an aperture-coupled microstrip line. The proposed compact DRA has a size of $49.5\ x\ 49.5\ x\ 1.575\ mm^3$. The dielectric patch has physical dimensions of $30x30x30\ mm$. The results of the proposed DRA is designed, analyzed and simulated   using an EM simulator. The simulated results of indicates that the obtained DRA present a gain of $4.45\ dB$ and a total efficiency of 93%. In addition, this DRA presents a reflection coefficient S_{11} less than -10 dB (VSWR<2) over a frequency band of $315.2\ MHz$ from 2.302 to $2.6171\ GHz$, which covers the $2.45\ GHz$ which is dedicated for ISM applications.

Keywords – Rectangular Dielectric Resonator Antenna, ISM Band, Microstrip Antenna

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Parametric Study of a Dielectric Resonator Antenna for ISM Applications

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Abstract – Dielectric resonator antennas have become widely used in many applications due to their several advantages such as small size, low profile, low loss, and high gain. This work presents a parametric study of a simple rectangular dielectric resonator antenna (RDRA), which is dedicated for ISM applications. To design this antenna, an EM simulation has been used. The proposed structure consists of plastic substrate and a simple Aperture-coupled feed line over a rectangular feeding slot made at the ground plane. The substrate has a relative permittivity εr of 2.65. The proposed antenna has a compact size of $49.5 \, x \, 49.5 \, x \, 1.6 \, mm^3$. During this parametric study, our goal is to show the effect of some DRA parameters on some antenna characteristics in terms of resonance frequency and reflection coefficients. Among the DRA parameters which are used in our parametric study, we can cite the physical dimensions of the resonator and the dimensions of the slot. The physical dimensions of the dielectric patch are $30 \, mm, 30 \, mm$ and $30 \, mm$ for the length, width, and height, respectively. As a results, the parametric study on the different DRA parameters indicates that the dimension of the dielectric patch and the length of the slot have a considerable effect on the resonance frequency value and the adaptation of the DRA.

Keywords – Antenna, Rectangular Dielectric Resonator Antenna, ISM Band, Resonant Frequency

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Shear Modulus of Different Aramid and UHMWPE Composites Used in Ballistic Protection

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Abstract – In this study, the independent shear modulus of various aramid and ultra-high-molecular-weight polyethylene fabrics used in ballistic armor materials was investigated. Within this scope, the results of applying the Digital Image Correlation (DIC) method to measure the in-plane shear modulus and strength of ballistic samples were analyzed. In most cases, calculating shear stress based on the average DIC strain values of the strain gauge area provides results closest to the strain gauges, while measurements based on single-point strain measurement show the greatest deviation from strain gauges. These results are attributed to the shear stress distribution in the central area of the sample. The shear test, with a special fixation apparatus, exposes the specimens cut according to the standard to pure shear, resulting in shear stress and shear strain. It is important to note that mechanical tests are independent of fiber or lateral direction. Because all composites have layer orientations [0, 90], they exhibit the same mechanical behavior in directions 11 and 22. In other words, the stacking of layers aligns the fiber direction of each layer at a 90-degree angle to the layer below and above, subjecting the mechanical test to this alignment. This ensured that the elastic moduli and damage criteria entered for the 11 and 22 directions were the same when creating the material model. When the results are examined, the composites with the highest shear stress values are: GS3000 UD-Aramid ballistic sample (461 MPa), Artec Aramid/Woven Aramid CT736 hybrid ballistic sample (258 MPa), and H62 UD-UHMWPE ballistic sample (251 MPa).

Keywords – Shear properties, Aramid, UHMWPE, Ballistic, Digital Image Correlation

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Study of the mechanical properties of mullite-zirconia composite prepared from kaolinite and aluminum slag

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Abstract – Mullite ($3Al_2O_3.2SiO_2$) exhibits excellent properties that make it an ideal material for high-temperature applications, including its low thermal expansion coefficient, low thermal conductivity, high resistance to high temperatures, high creep resistance, and phase stability up to the melting point. However, monolithic mullite ceramics have both low strength and low fracture toughness at room temperature. Reinforcing mullite through composite formation helps overcome these limitations. Incorporating zirconia (ZrO_2) particles is one of the most common solutions. In particular, the addition of ZrO_2 to mullite enhances both mechanical properties and promotes densification while retarding the growth of mullitic phase grains in mullite-zirconia composites, thus generating significant interest.

However, various processing approaches have been described for the fabrication of mullite-zirconia composites. A low-cost traditional sintering method has been widely used. In such a method, zircon, kaolinite, and alumina are used as starting materials. Some researchers have used halloysite, boehmite, and zirconia to prepare mullite/zirconia composites. The aim of the present study is to prepare mullite-zirconia composites through reactive sintering of zircon and kaolin, as well as aluminum slag, thus promoting the use of Algerian kaolin and industrial waste. Several analyses were conducted to understand the phase transformation kinetics during thermal treatment.

Keywords – Composite, Mullite, Zirconia

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Quantum chemical development of advanced deep eutectic solvents through density functional theory analysis

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Abstract – This research delves into the creation of eutectic mixtures incorporating various hydrogen bond donors (HBDs) such as ethylene glycol, levulinic acid, sorbitol, citric acid, tartaric acid, oxalic acid, diethylene glycol, and glycerol, paired with the acceptor choline chloride (ChCl). Through adjusting the mole ratios between ChCl and the HBDs, we synthesized eight unique deep eutectic solvents (DESs). To affirm the efficiency of these formulations, Density Functional Theory (DFT) was applied, providing a quantum chemical perspective. The experimental validation was conducted by comparing Fourier-transform-infrared (FT-IR) vibrational frequencies against those predicted by DFT, specifically employing the B3LYP functional and 6-311G+ basis set. Our quantum chemical analysis highlighted one solvent, DES 4 (ChCl: CitA), as particularly effective, showing the most advantageous properties with an energy gap of 0.04 eV, a chemical potential of 0.16 eV, softness of 42.53 eV, and an electrophilicity index of 1.65 eV. This solvent also demonstrated the lowest chemical hardness (0.03 eV) and electronegativity (-0.17 eV). Additionally, the density of states (DOS) analysis was employed to further investigate the electronic structures and energy state occupations, reinforcing the DFT-driven insights into the experimental DES configurations.

Keywords – Choline Chloride, Deep Eutectic Solvents, Density Functional Theory, Frontier Molecular Orbitals, Density of States.

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Ultraviolet Avalanche Photodiodes

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Abstract-AlGaN based ultraviolet (UV) photodetectors with cutoff wavelengths smaller than 280 nm have proved their potential for solar-blind detection. They can be used in applications such as missile warning and tracking systems, secure UV optical communication systems for space-to-space communication, ozone layer monitoring, biological agent, and gas detection. Due to their high responsivity (>600 A/W), high speed, and low dark current properties, photomultiplier tubes (PMTs) are frequently used for such applications. However, they are expensive, bulky, and require high operation voltages (usually > 1 kV). In order to achieve solar-blind detection, PMTs should be integrated with complex and expensive filters. So, there is a certain need for high performance solid-state UV photodetectors that can be used to replace PMTs. The authors report high performance solar-blind photodetectors with reproducible avalanche gain as high as 1560 under ultraviolet illumination. The solar-blind photodetectors have a sharp cut-off around 276 nm. The dark currents of the 40 μm diameter devices are measured to be lower than 8 fA for bias voltages up to 20 V. The responsivity of the photodetectors is 0.13 A/W at 272 nm under 20 V reverse bias. The thermally limited detectivity is calculated as $D^*=1.4 \times 10^{14}$ cm $Hz^{1/2}$ W^{-1} for a 40 μm diameter device. The authors also report on the experimental evaluation of the impact ionization coefficients that are obtained from the photomultiplication data. A Schottky barrier, suitable for back and front illuminations, is used to determine the impacti onization coefficients of electrons and holes in an AlGaN based avalanche photodiode.

Keywords – UV Photodetectors, Photodiodes, Impact Ionization, Avalanche, Photocurrent Gain

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DEVELOPMENT OF MANUFACTURING OF NANOCOMPOSITE REINFORCED AIRCRAFT FRAME WITH TEMPERATURE CONTROLLED RAPID CURING

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Abstract – The aim of this research is to experimentally determine the behavior of samples produced with different rapid curing methods in the thermal curing (hardening) reaction of thermoset resins in D Shore hardness tests. Laminating epoxy resin was used as the basic matrix material and hardener was used as the hardening material. The effects of hardening of the composite materials formed as a result of the experiment through cross-linking of polymer chains were examined. The results obtained are given in graphs.

Keywords – Epoxy Resin in Aviation, Rapıd Curing, New Generation Composite Materials.

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Structural and Bonding Analysis of N-(6-Acetyl-1-Nitronaphthalen-2-yl) via Density Functional Theory

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Abstract – N-(6-acetyl-1-nitronaphthalen-2-yl) is a complex organic compound with a naphthalene core, an acetyl group at the 6th position, and a nitro group at the 1st position. Its structural versatility, influenced by these functional groups, impacts its chemical reactivity and electronic properties. The molecule's aromatic nature adds stability and potential involvement in π-electron interactions. Understanding its geometry and bonding characteristics, including intermolecular and intramolecular interactions, is crucial for comprehending its behavior in various chemical contexts and exploring applications in fields such as organic synthesis and pharmaceuticals.

This study employs density functional theory (DFT) to explore the geometric conformation and bonding characteristics of N-(6-acetyl-1-nitronaphthalen-2-yl). Initial geometry optimization via DFT is followed by a comprehensive investigation into both intermolecular and intramolecular bonds utilizing reduced gradient density (RGD) and molecular electrostatic potential (MEP) analyses. Through RGD, the examination focuses on elucidating electron density and gradients between molecules, providing insights into their interactions. Meanwhile, MEP analysis unveils the distribution of electron density within the molecule itself. This combined approach offers a nuanced understanding of the molecule's structural features and bonding behavior, enriching our knowledge of its behavior in diverse chemical environments.

Keywords – Naphthalene Derivative, Density Functional Theory, Molecular Structure, Chemical Bonding, Functional Groups

A Hybrid Approach for Accurate Prediction of IC50 Values for 3CLpro Inhibitors

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Abstract – In this study, we propose a novel hybrid approach, combining Grey Wolf Optimizer (GWO) with Extreme Learning Machine (ELM), termed GWO-ELM, for predicting the half-maximal inhibitory concentration (IC50) values of 3CLpro inhibitors. The model was trained and validated using a dataset comprising 74 ML300 analogues as inhibitors of 3CLpro. GWO was employed to optimize the parameters of the ELM algorithm, enhancing its predictive capability. Our results demonstrate that the GWO-ELM model outperforms traditional machine learning techniques and standalone with a coefficient of determination R² of 0.98 and 0.95 and a root mean squared error RMSE of 0.05 and 0.28 for the train and test sets respectively. The proposed approach offers a promising tool for rapid and precise prediction of IC50 values for 3CLpro inhibitors, facilitating drug discovery and development efforts targeting coronavirus proteases

Keywords: Modeling, SARS-CoV-2, 3CLpro, GWO, ELM.

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Performance Comparison of Deep Learning-based Models on Breast Cancer Detection

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Abstract – Breast cancer is one of the most common types of cancer among women and early detection can significantly reduce mortality rates. Traditional methods such as mammography can have difficulties in detecting small and benign tumors and increase the risk of misdiagnosis. This study utilizes artificial intelligence technologies for early detection of breast cancer. Because of this, it uses deep learning models to analyze data from established imaging technologies such as mammography, MRI, and ultrasound, and improved diagnostic accuracy is demonstrated. As a result of the experimental results using Convolutional Neural Networks (CNN), EfficientNet, ResNet, and DenseNet models, the highest success rate was achieved in the CNN model with an accuracy of 84.5%. As a result, this study aims to support and accelerate the process of doctors' evaluation of patients by creating a model with high accuracy, sensitivity, and specificity rates from deep learning models. This will allow diagnosis to become more efficient and accessible while aiming to reduce medical errors and early diagnosis.

Keywords – Breast Cancer, Deep Learning, Mammogram, Cancer Diagnosis, Early Detection

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Electrochemical Sensing of Uric Acid Using a Carbon Paste Electrode Modified by Cobalt nanoparticles

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Abstract – This study presents the development of a new electrode, based on a cobalt-modified carbon paste supported on silica, with the aim of evaluating its effectiveness in catalysing the oxidation of uric acid. The $Co/SiO2$ catalyst powder synthesised by impregnation was characterised by scanning electron microscopy (SEM), X-ray diffraction (XRD) for structural analysis and Fourier transform infrared spectrometry (FT-IR) for compound identification. The electrochemical reactivity of the resulting electrode ($Co/SiO_2/GC$) was studied using cyclic voltammetry and electrochemical impedance spectroscopy (EIS). Cyclic voltametry was also used to study the electrocatalytic performance of the modified electrode in a phosphate buffer solution (pH = 7) in the presence of uric acid (UA). The results show a significant electrocatalytic effect in the concentration range 0.1 to 3 mM for the oxidation of uric acid.

This work highlights a simple procedure for the fabrication of a newly developed, low-cost modified electrode that can be successfully used as a sensor for the detection of UA.

Keywords – Electrode , Cobalt, Catalyst, Electrochemical Detection, Uricacid, Sensor.

Mechanical Performance of Microfiber-Reinforced Geopolymer Mortar with Nano-Titania

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Abstract – Geopolymer (GP) mortars are highly acknowledged in the concrete industry as superior cement alternatives, providing an environmentally benign and sustainable building solution. Micro-fibers and nanoparticles are crucial for improving the mechanical characteristics of fiber-reinforced (FRF) GP mortars and expanding their practical application. By adding different amounts of nano-Titania, this work seeks to enhance the mechanical behaviour of GP mortars based on micro basalt-FRF fly ash. Two weight percent of micro-basalt fibres (MBF) are added to GP mortars together with four different titanium doses (varying from 1% to 4%). For comparison, a control model with 2% MBF and no Titania is also created. According to the findings, micro basalt-FRF-GP mortar's toughness modulus, flexural strength, elastic modulus, and compressive strength are all increased by 27%, 61%, 8%, and 66%, respectively, when 3% titanium is added.

Keywords – Geopolymer Mortar; Micro-Basalt Fibers; Nano-Titania; Compressive Strength; Toughness Modulus

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Measure The Software Quality Based On Bat Optimization Algorithm

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Abstract – Measuring software quality is essential for software development as it affects the user experience and performance of software. Traditional methods of measuring software quality can be time-consuming and resource-intensive Therefore, the paper proposes a novel method based on bat optimization algorithm to measuring software quality. It is an optimization method inspired by nature and based on bats' echolocation behavior. The experiments on a data set of jm1 software projects that the bat optimization algorithm can effectively measure software quality. Regarding accuracy, the findings show that Decision Tree and Random Forest regularly beat the other classifiers. These models have excellent accuracy rates, suggesting their ability to properly categories software instances and identify possible quality concerns. KNN perform well, whereas the Multilayered Perceptron model and Adaboost performs poorly. Out of fiver classifier the performance of Decision tree and Random forest classifier is good, achieve Decision tree 99.7% and Random forest classifier 97.9% training accuracy.

Keywords – Machine Learning, Bat Optimization, Software Quality, Evaluation Matrix

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NanoElectro Nexus: Unveiling the Future of Sustainable Chemistry with PANI/PVA-NiCu Nanocomposites

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Abstract – This research delves into the synthesis and characterization of nanocomposites composed of polyaniline (PANI), nickel (Ni), and copper (Cu). These nanocomposites are designed as highly efficient adsorbents and photocatalysts for the targeted removal of specific organic pollutants, including methylene blue and crystal violet. The selection of these pollutants is driven by their significant environmental impact and potential health risks.

The study reveals that the PANI/PVA-NiCu nanocomposites exhibit exceptional adsorption capabilities. By optimizing operational parameters, these nanocomposites achieve impressive results: 94% adsorption efficiency for methylene blue within 180 minutes and an even more remarkable 99.93% adsorption efficiency for crystal violet in just 45 minutes. Notably, the PANI/PVA-Ni50Cu50 nanocomposites demonstrate the highest performance.

The experimental data aligns remarkably well with both the pseudo-second-order kinetic model and the Langmuir isotherm model (with an R^2 value exceeding 0.98). Furthermore, a thermodynamic analysis confirms the endothermic nature of the adsorption process, emphasizing its potential for practical applications in electrochemistry.

This research opens exciting avenues for harnessing nanocomposites in environmental remediation and sustainable technologies. The combination of PANI, nickel, and copper holds promise for addressing pollution challenges and advancing electrochemical applications.

Keywords – Nanocomposites, PANI, Nickel, Copper, Adsorption

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Date palm waste, a reservoir of natural polyphenols with pharmacological potential

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Abstract – Date palm waste is an important source of bioactive compounds to become an agent with pharmacological potential. In this projection, recently many infectious diseases caused by pathogenic microorganisms are one of the causes of therapeutic failures contributing to an increase in mortality and/or morbidity. For this, the aim of this research study was to evaluate the antimicrobial potential of hydro-alcoholic extracts of date palm waste (leaf, fiber and fruit bunch) collected in southern Algeria against three major nosocomial infectious agents by minimum inhibitory concentration (MIC). The results obtained revealed the inhibitory power of hydro-alcoholic extracts against all nosocomial pathogens strains tested. The MIC values of different parts of date palm waste against *E. coli* and *Staphylococcus aureus* increased from 6.25% to 12.5% (v/v) while *C. albicans* showed MICs of around 3.12%. These results are supported by hight levels of polyphenols which vary (3.9 – 6.1) mg EAG/g and flavonoids which vary (1.6 – 2.4) mg EC/g, respectively. In perspective, it is clear that all date palm waste parts tested could be a reservoir and sources of bioactive molecules that require pharmaceutical and clinical studies.

Keywords – Date Palm, Waste Valuation, Polyphenols, Flavonoids, Antimicrobial.

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İnşaat Yönetiminde Coğrafi Bilgi Sistemi ve Uzaktan Algılama Yöntemlerinin Kullanılabilirliğinin Araştırılması

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Özet- İnşaat sektörü dünya ekonomisine yön veren en önemli sektörler arasında yer almaktadır. Teknoloji alanındaki gelişmeler inşaat sektöründe yürütülen uygulamalarda, planlama ve proje tasarım süreçlerinde maliyet, işgücü ve zaman tasarrufu yönleriyle önemli faydalar sağlamaktadır. İnşaat projelerinin özellikle konumsal problemlerine etkin çözümler sunmakta olan Coğrafi Bilgi Sistemleri (CBS) ve Uzaktan Algılama (UA) uygulamaları bilgi teknolojilerinin bir parçasıdır. İnşaat sektörü proje yönetim sürecinde birçok mühendislik problemlerinin çözümüne karar desteği sağlayan CBS ve UA uygulamalarını, bu teknolojilerin kullanımının yönetim sürecine önemli bir etkisi bulunmaktadır. CBS ve UA uygulamalarının bu yönüyle keşfedilmesi proje yönetiminde kullanım olanaklarının araştırılması ve uygulanabilirliğinin tartışmaya açık bir hale gelmesi söz konusu olmuştur. İnşaat projelerinin yönetiminde dijital çözümleri öneren yeni yaklaşımların geleneksel yöntemlerin yerini alması ile CBS veya UA ile desteklenen yönetim sistemleri kullanılmaya başlamıştır. CBS ve UA uygulamaları, proje süreciyle ilgili detaylara hızlı erişim ve üç boyutlu bilgi sağlama yetenekleri ile sektörde proje yönetimi etkinliğini artırmaktadır. Bu kapsamda, inşaat yönetim sürecinde ve maliyet analizlerinde CBS ve UA yöntemlerinin kullanım olanaklarının araştırılması, zaman ve kaynak yönetimine sağlanan katkıların yanı sıra, muhtemel risklerin iş programına etkilerinin ve proje verimliliğinin değerlendirilmesini de kolaylaştıracaktır.

Bu çalışmada, inşaat yönetiminde CBS ve UA ile sağlanan katkılar bir literatür taraması ile sunulmakta ve sonuçlar klasik yöntemlerle karşılaştırılarak değerlendirilmektedir.

Anahtar Kelimeler – İnşaat Yönetimi, Coğrafi Bilgi Sistemi, Uzaktan Algılama, Proje Yönetimi, İş İlerleme.

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Providing Faulty Thread Detection in Tie Rod End Grease Fittings with Machine Learning Method "YOLO" algorithm and "Smart-VS"

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Abstract – The tie rod end transmits the movement from the steering box to the wheels of the vehicle. The joint in the tie rod ends ensures that the pushing motion is transmitted in a mobile way. These joints must be lubricated with grease to reduce the friction force. In order to easily perform the lubrication process, there are greases that have an oily ball at the end and can be easily disassembled. Manufacturer-induced faults may occur in greasers. Frequently encountered tooth production errors can cause serious problems. A greaser with a thread defect can be fitted with a tight fit and disconnected from the assembly under fatigue. For this reason, greasers must be checked and separated during assembly. Defect control systems used in industry are generally carried out manually. At the same time, manual control varies according to operator competence and initiative. High efficiency, low cost and objectivity can be achieved with machine learning-based systems. One of the machine learning techniques, the deep learning algorithm YOLO (You Only Look Once) is extremely fast and sharp. In the supervised learning process, it is necessary to obtain the data that is desired to be determined, and to label and train the data. In this study, a detailed investigation of YOLO-based object detection with object detection methods designed in recent years, the effect of data labeling on detection results and Smart-VS Smart sensor performance comparisons were made.

Keywords – YOLO, Deep Learning, Object Detection, Grease Fitting, Labeling

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Covid-19 Hastalığının Stres Etkisiyle Matematiksel Modellenmesi

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Özet – Bu çalışmada, kesirli mertebeli diferansiyel denklemlerle formüle edilen, Covid-19 için matematiksel bir model sunulmuştur. Denge noktalarının yerel kararlılığını incelemiştir ve kesirli türevlerin çözümlerin kararlılığı ve dinamik davranışı üzerindeki etkisini değerlendirilmiştir. Caputo kesirli operatörü, farklı başlangıç koşullarının hesaplanmasını kolaylaştırmak için kullanılmıştır. Kesirli mertebeli türevlerin ve farklı parametrelerin popülasyon dinamikleri üzerindeki etkisini analiz etmek için sayısal simülasyonlar yapılmıştır. Çeşitli kesirli mertebe ve parametre değerlerine dayalı grafiklerin sunulması, bulguların görselleştirilmesine yardımcı olmuştur. Ayrıca stresin Covid-19 üzerindeki etkisi de araştırılmıştır. Sonuçların, tıbbi araştırmacılara Covid-19'un taranması ve tedavisi için uygun önlemlerin geliştirilmesinde değerli bilgiler sağlaması beklenmektedir.

Anahtar Kelimeler – Kesirli Mertebeden Diferansiyel Denklemler; Kararlılık Analizi, Covid-19; Numerik Simülasyonlar; Varlık Ve Teklik

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Farklı Makine öğrenme teknikleri ile Düzce ilinin doğalgaz talebinin tahminlenmesi

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Özet – Doğalgaz, organik bileşenli maddelerle yeryüzünün alt kısımlarında milyonlarca yıldır sürmekte olan kimyasalların ayrılması durumunda ortaya çıkmıştır. Doğal gaz talep tahminleme, sanayi sektöründe önemlidir çünkü doğal gaz, birçok endüstriyel işletmenin enerji ihtiyacını karşılamak için önemli bir kaynaktır. İşletmeler, üretim süreçlerini, sıcaklık kontrolünü, ısıtma ve soğutma sistemlerini, buhar üretimini ve birçok diğer operasyonel gereksinimlerini doğal gaz kullanarak gerçekleştirirler. Talep tahmini, bir işletmenin doğal gaz ihtiyacını doğru bir şekilde belirlemesine yardımcı olur. Bu, doğal gaz tedarikini planlamak, stok yönetimini optimize etmek ve operasyonel süreçleri düzenlemek için kritik önem taşır.

Karadeniz Bölgesi'ndeki illerin sanayi bakımından değerlendirmesi yapıldığında, %10'luk bir oran ile Düzce ikinci sırada yer almaktadır. Düzce'deki sanayi firmalarının enerji yoğunluğuna göre dağılımı yüksek olduğunda bu çalışmada Düzce ilinde doğalgaz talebinin tahmin edilmesi EPDK (Enerji Piyasası Düzenleme Kurumu) 2018-2022 yılları arasındaki verileri ile ARIMA, TBATS ve PROPHET yöntemleri kullanılarak tahminleme gerçekleştirilmiştir. Çalışma sonucunda, Düzce ilinin doğalgaz talebinin genellikle ocak ayında yüksek olduğu tespit edilmiştir. Yapılan tahminler sonucunda, TBATS yönteminin ocak, şubat, mayıs, temmuz ve kasım aylarında daha başarılı olduğu görülmüştür. Mart, Nisan, Haziran, ağustos ve aralık aylarında ise ARIMA yönteminin daha etkili olduğu tespit edilmiştir. Eylül ve Ekim aylarında ise PROPHET yönteminin daha iyi sonuçlar verdiği gözlemlenmiştir. Ancak, bu farklar genellikle küçüktür ve yöntemler arasında benzer sonuçlar elde edilmiştir. Bu çalışmadan yapılacak çıkarım Düzce ilinde doğalgaz talebinin mevsimsel olarak artacağını ve çalışmada kullanılan modellerin doğalgaz talebi tahmininde başarılı olduğunu göstermektedir.

Anahtar Kelimeler – Doğalgaz Tüketimi, Tahminleme, ARIMA, TBATS, PROPHET

Synergistic Effect of Zinc ion on Corrosion Inhibition of Carbon Steel in acid solution using new molecule

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*Abstract –*The corrosion and inhibition behaviors of carbon steel in the presence of new molecule and $ZnCl_2$ have been studied using gravimetric method and electrochemical techniques. Results obtained by various techniques are close to each other and maximum Inhibition efficiency is 84% at C= 10^{-6}M. Synergistic parameters and Statistical study of "F" test suggest that a synergistic effect exists between new molecule and Zn^{2+}.

Keywords –Carbon Steel, New Molecule, Zncl2, Synergistic Effect, Electrochimique Technique

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Examining Framing of KLIA Shooting in Malaysian Newspaper

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Abstract – News frames in the media help determine how the public interprets and discusses issues happening around them. This study aimed to examine frames used by the media on the KLIA shooting that occurred on April 14, 2024. It was reported that a man with a gun wanted to shoot his wife, but he had missed. He ended up heavily injuring another man at the scene. Many newspapers report on crimes in their unique way, following their agendas. Therefore, framing analysis helps researchers identify the way each story is reported. News stories relevant to the KLIA shooting were collected from a top English Malaysian newspaper, The Star from the day of the incident till the last story reported, which is from April 14th to 30th, 2024. Out of the 45 news stories collected, 53.33 percent (24) were categorized under the responsibility frame, 33.33 percent (15) under the human-interest frame, and the remaining 13.33 percent (6) under the conflict frame. The stories under the responsibility frame show elements of crediting or blaming a particular individual or institution. In this case, the newspaper highlighted the efforts taken by the authorities in tightening up security at the airport. The journalists also focused on giving credit to a security man at the airport for his swift action during the incident. Meanwhile, the second frame which is the human-interest frame focuses on the individual or emotions. For example, the newspaper kept the public updated on the man heavily injured during the incident. However, there was only one story that urged domestic abuse to be taken seriously. Lastly, the conflict frame shared stories of the conflict between the shooter and his wife. The analysis showed that the dominant frame used is the responsibility frame. This concludes that there was a lack of coverage for the victims and domestic abuse. The media must educate the public on domestic abuse so they can understand and actively participate in policymaking on issues surrounding them.

Keywords – Newspaper, Framing Analysis, Portrayal, Frames, Media

Design of Coupled-Line Wilkinson Power Divider for Wireless Communications

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Abstract – A power divider (PD) is a fundamental component in wireless communication systems. This microwave component divides the input power equally or unequally into several smaller outputs. There are many types of PDs in microwave domain such as Wilkinson power divider (WPD), GYSEL power divider (GPD) and others, however, WPDs are commonly used in microwave electronics. These dividers typically operate at a single frequency band and utilize two quarter-wavelength (λ/4) transmission lines and one isolation resistor. The standard WPD distributes power equally with minimal loss, presents reciprocity as it behaves similarly in both directions, and provides high isolation between the output ports. This paper presents the design of a WPD with coupled lines for wireless applications. The coupled lines offer many advantages to the standard WPD in terms of wide operating frequency range, compact size, and low profile. The proposed WPD operates at 2.1 GHz third generation mobile applications. The designed Wilkinson PD was printed on a Rogers' RO4003C substrate with a dielectric constant of 3.55. The substrate thickness is 0.813 mm, and a copper thickness of 35 μm. Based on the simulation results, it is shown that the proposed WPD presents low return losses in all the ports and high isolation over the third-generation mobile band.

Keywords – Wilkinson Power Dividers, Coupled Line, Isolation, Return Loss, And Power Dividers.

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A novel Frequency Reconfigurable L-shaped Antenna for WiMAX and 5G Application

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Abstract – Reconfigurable antennas can be used in contemporary wireless and portable devices to work across many frequency bands and scan radiation patterns in accordance with user requirements. In this paper, we present a simple frequency reconfigurable antenna. Using frequency reconfigurability, one antenna can be used for many applications only by switching between the selected bands. To do the reconfigurability, PIN diodes will be used, by strategically placing these diodes within the antenna structure, the resonance frequency can be adjusted with minimal power consumption. The proposed antenna consists of two asymmetric L-shaped rectangular patches electrically connected by a single PIN diode. The suggested antenna can function in two different frequency bands, depending on the PIN diode's switching state. It operates at 2.1GHz (3G) and 3.5 GHz (5G) during forward bias of the diode, 5.3 GHz (WiMAX) and 2.1 GHz (3G) during reverse bias of the diode. The antenna ($32\times44\times1.6$ mm3) is designed on FR4 substrate with permittivity of 4.4 and tangential loss of 0.02 using the CST Microwave studio simulator. this antenna presents a high gain and favorable radiation characteristics in the operating range which is required for fifth-generation networks (5G), and microwave connectivity worldwide interoperability (WiMAX) applications.

Keywords – Reconfigurable Antennas, WiMAX,5G, Pin diode, CST

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Surveillance Program of African swine fever in Albania

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Abstract – The African swine fever (AFS) disease surveillance program in the Republic of Albania has clearly defined all protective measures related to the prevention of the virus entering in our territory, monitoring the epidemiological situation in the region and immediate notification of the risk of the introduction of the virus. This program also has establishing the proper methods of detecting the AFS virus in backyard farms and swine breeding farms, monitoring the epidemiological situation in wild boars population in cooperation with all the involved state and private actors, which includes the detection of the virus, the reporting of the positive cases and timely communication of the presence of the ASF virus. In this way, the continuous collection and analysis of information related to animal health and the timely dissemination of information so that measures can be taken to control the disease and manage the situation in the country. A key point of the program is the awareness campaign with all operators involved in disease surveillance, including meetings and training with official and private veterinarians, hunters, farmers, forest managers and transport operators.

Keywords – African Swine Fever, Albania, Program, Surveillance, Swine

Protection of the environment by an adsorption process of an organic pollutant on an activated carbonate material

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Abstract - In this study, a Carbonate material (CM raw) and its thermally activated at 800°C (CM800) were employed for removing Congo red (CR) from aqueous solutions. The aim was to integrate the characterization results of the modified material, CR adsorption, and spectroscopic study to propose a coherent mechanism for the CR-CM800 interaction. This study addresses the lack of results in this area to some extent. Carbonate materials are abundant, inexpensive, and available in various countries worldwide. The materials were characterized using X-ray diffraction and scanning electron microscopy. A solid/solution concentration of 1 g L^{-1}, pH 7, equilibrium time of 2 hours, and temperature of 40°C were determined as optimal conditions for maximal CR adsorption by CM800, with 280.4 mg g^{-1} compared to 30.5 mg g^{-1} for CM. The pseudo-second-order model adequately described the kinetic data. The experimental isotherms were well-fitted by the Redlich–Peterson model, with coefficient of determination and average relative error values of $\geq 0.98\%$ and $< 10.0\%$, respectively. Thermodynamic parameters suggest a spontaneous and endothermic process. Understanding the interactions between dyes and carbonate materials is crucial for advancing their use in wastewater treatment.

Keywords: Carbonate Material; Removal; Congo Red; Equilibrium; Wastewater.

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Alternative uses of *Helichrysum italicum* in the food industry

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Abstract – Helichrysum italicum is an evergreen plant native of the Mediterranean region. It has been widely used in traditional medicine as an anti-inflammatory and antimicrobial agent. It is commercially cultivated in Bulgaria for the extraction of the essential oil. In addition to its therapeutic uses, *Helichrysum italicum* is used to flavor foods such as bakery products and soft drinks, as well as natural colorant and preservative.

This review aims to provide an overview of the current state of knowledge on the use of *Helichrysum italicum* in the food industry.

Materials and Methods: Information obtained from scientific publications and other sources was included.

Results: Studies on the use of *Helichrysum italicum* in foods are limited

The chemical composition, bioactive compounds and nutritional value of *Helichrysum italicum* flowers were reported.

They are mainly composed of carbohydrates (>80% dry weight), followed by minerals ($6.31 \pm 0.95\%$ dw), proteins ($5.44 \pm 0.35\%$ dw) and lipids ($3.59\% \pm 0.53\%$ dw). Total lipids of *Helichrysum italicum* contain mainly saturated fatty acids (SFA) (54.50 ± 0.95 % of total fatty acids) polyunsaturated fatty acids (PUFAs) (37.73 ± 1.25 % of total FA) and lower amounts of monounsaturated fatty acids (MUFAs) (7.77 ± 0.34 %). In the group of PUFAs, the predominant fatty acid is the omega-6 PUFA, linoleic acid (C18:2 n-6) - up to $22.55 \pm 0.76\%$ of the total FA. *Helichrysum italicum* contain high amounts of Fe, Zn, Ca, and K, along with a high content of antioxidants such as polyphenols and carotenoids.

Keywords – Helichrysum Italicum, Edible Flowers, Fatty Acids, Chemical Composition, Food Uses.

Spatial Distribution Analysis of Urban Health Services: A Case Study of Tangier

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Abstract – Primary health care serves as a fundamental pillar within the healthcare system, substantially influencing population health. Spatial accessibility is pivotal in evaluating the efficacy of primary health care provisions. This study employs Geographic Information System (GIS) tools to analyze the spatial distribution of urban health services, focusing on both public health centers and private clinics in Tangier. The region's manageable size and population density facilitate comprehensive data collection and analysis. Utilizing data sourced from the High Commission for Planning of Tangier, which details population statistics across various communes, this research integrates demographic data with travel time metrics (30 min/20 min/10 min walk) to assess accessibility to health facilities. The study aims to identify spatial patterns and extract insights concerning the accessibility of health services, enhancing our comprehension of the dynamic between population distribution and health facility proximity. This analytical approach contributes significantly to the ongoing discussions on healthcare accessibility and serves as a robust framework for optimizing the distribution of health resources. By including both public and private health facilities in the analysis, the study provides essential findings for health planners and policymakers. These insights aid in addressing spatial disparities and ensuring equitable access to primary health care, advancing the overarching goal of universally accessible healthcare.

Keywords – Primary Health Care, Geographic Information System, Spatial Accessibility, Demographic Data, Travel Time

SOCIAL AND PSYCHOLOGICAL IMPACTS OF UNEMPLOYMENT ON EDUCATED YOUTH: A STUDY IN DISTRICT FAISALABAD

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Abstract – Unemployment among educated youth has profound social and psychological impacts, often leading to feelings of frustration, low self-esteem, and a sense of hopelessness. Moreover, prolonged unemployment can exacerbate mental health issues such as anxiety and depression, hindering personal development and future prospects. However, from its inception, it has been dealing with a severe problem, including Pakistan's high rate of unemployment. In light of the current COVID epidemic, unemployment, particularly among young people, is a significant problem for nations worldwide. The goal of the current study was to examine the social and psychological effects of unemployment on educated young people in the district of Faisalabad. Rural areas in Pakistan are home to a sizable portion of the country's youth population. The growth rate was insufficient to generate employment possibilities, which frustrates young people and fuels conflict, instability, and violence. Since the early 20th century, unemployment has been viewed as a global problem. Youth unemployment has undoubtedly risen since the turn of the century. The district of Faisalabad served as the site of the current study. A quantitative research approach was used. A sample of 150 respondents was selected randomly from the two selected towns. An interview schedule was used to collect the data, which was then analyzed using SPSS. Most of the respondents believed that unemployment was impacted by economic uncertainty. The majority of the respondents agreed that recessions have an impact on unemployment. The majority of respondents agreed that excessive inflation causes employers to terminate workers. Most of the respondents agreed to a great extent that youth faced frustration due to unemployment. The majority of the respondents agreed to a great extent, unemployed youth faced tension and stress in their lives. Most of the respondents reported that they felt shy when they were labeled as part of society. In bivariate analysis, variables had significant associations between independent variables and socio-psychological effects. It was determined that youth suffer psychologically and socially because of unemployment. It was suggested that the provision of jobs, skills and counseling would be helpful in coping with the problems of youth.

Keywords – Social, Unemployment, Psychological, Quantitative, Youth

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Critical and Compensation Behaviors of a Mixed-Spin Ising System on a Two-Dimensional Graphene-like Structure

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Abstract – The magnetic and critical properties of a mixed spin-1/2 and spin-3/2 Ising system on a two-dimensional graphene-like structure were investigated using the mean-field approximation based on the Gibbs-Bogoliubov inequality. We studied the effects of exchange interactions, crystal field, and external magnetic field on the magnetizations and phase diagrams of the system. First- and second-order phase transitions, critical end-points and compensations temperatures were obtained for specific physical system's Hamiltonian parameters. The influence of several physical parameters on blocking temperature has also been highlighted.

Keywords – Phase diagram; Magnetization; Graphene monolayer; Ising model; Mean-field;

Theoretical Study of the Magnetic Behavior of an Ising System on a CrI₃-type Structure

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***Abstract** –* The critical and magnetic characteristics of a mixed spin-1 and spin-3/2 Ising system on a two-dimensional CrI₃-type structure were examined through the mean-field approach based on the Gibbs-Bogoliubov inequality. We investigated the effects of exchange couplings, anisotropies, and external magnetic field on the magnetizations and phase diagrams of the lattice. Phase transitions of first- and second-order, isolated critical points and compensations behavior were determined for specific physical system's Hamiltonian parameters. We also demonstrated the existence of multiple hysteresis loops for certain physical conditions.

Keywords – Phase diagram; Magnetization; CrI₃-Type Structure; Ising Model; Mean-Field

Application of thermochemical calculations derived from the Thermochemical software "HSC-Chemistry" in the fields of co-incineration and climate change: Case of reducing CO_2 emissions, greenhouse gases

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Abstract – Thermochemical calculations play a crucial role not only in understanding and optimizing scientific and technical processes, but also in seeking sustainable solutions that are compatible with the imperatives of climate change. The types of applications of thermochemical calculations in this expanded context can include:

1- The analysis of the feasibility of a process and its climate impact: Before conducting any experiments in the laboratory, thermodynamic calculations can assess not only the technical viability of a process but also its carbon footprint and its impact on the climate. This reduces the number of experiments needed and allows for the selection of pathways that minimize greenhouse gas emissions.

2- Conducting an accelerated and eco-responsible research program: Thermochemical calculations facilitate speeding up the research process by quickly identifying the most promising approaches from both thermochemistry and environmental perspectives. This reduces the costs associated with research and promotes the development of eco-responsible solutions to climate challenges.

3- Analysis of industrial processes in harmony with the environment: Thermochemical calculations can be applied on a large scale to analyze existing or proposed industrial processes. They assist in optimizing these processes to minimize their carbon footprint, reduce energy consumption, and promote cleaner and climate-friendly production.

In this work, we used thermochemical calculations based on the minimization of free enthalpy using the HSC Chemistry computer tool to track the phenomenon of $CO_2(g)$ capture, a greenhouse gas. This keynote address covers the following three axes:

1- Generalities on thermochemical calculations.
2- Presentation of the thermodynamic database HSC-Chemistry.
3- Application of HSC Chemistry in the field of $CO_2(g)$ capture, a greenhouse gas.

Keywords – CO2 Greenhouse Gas, Capture, HSC Chemistry, Thermochemical Calculations

Yüzeyde Güçlendirilmiş Raman Saçılması ile *Candida albicans'*ın Hassas ve Hızlı Tespiti

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***Özet* –** Patojenler, insan sağlığı üzerinde ciddi riskler oluşturan mikroorganizmalardır. Bu mikroplar, enfeksiyonlara neden olarak sağlık sorunlarına yol açabilir ve hatta salgınlara sebep olabilir. Özellikle *Candida albicans* (*C. albicans*) gibi fırsatçı patojenler, ciddi enfeksiyonlara neden olarak yaşamı tehdit edebilir. Bu noktada, hastalıkların kontrolü ve tedavisi için patojen tespiti kritik bir rol oynar. Bu çalışma, moleküler titreşimlerin tespitinde gelişmiş hassasiyet ve özgüllük sunan yüzeyde güçlendirilmiş Raman saçılması (SERS) tekniğini kullanarak *C. albicans'*ın hızlı ve hassas tespitini sağlamayı amaçlamaktadır. Bu amaçla ilk adım olarak yeşil sentez yöntemiyle gümüş nanopartiküller (AgNP'ler) sentezlendi. Sentezlenen partiküller taramalı elektron mikroskobu (SEM), zeta potansiyeli ve parçacık boyutu analizi kullanılarak karakterize edildi. Bulgular, sentezlenen parçacığın boyutunun yaklaşık 100 nm olduğunu gösterdi. Parçacıkların SERS yeteneği, Raman aktif prob moleküle karşı değerlendirildi. SERS analizi sonucunda prob molekülünün 10 nM konsantrasyonuna kadar etkili bir şekilde tespit edildiği görüldü. Ayrıca, AgNP'lerin SERS yeteneğinden faydalanarak 10^3 cfu/mL hücre yoğunluğuna kadar *C. albicans'*ı tespiti gerçekleştirildi. Sunulan bu yaklaşım, SERS ve AgNP'lerin avantajlarından yararlanarak patojen tespit yöntemlerinde önemli bir ilerleme sağlayabilir ve sağlık sektörü gibi alanlarda potansiyel bir çözüm sunabilir. Son olarak, gümüş nanopartiküllerin üretilmesinde, çevre dostu ve sürdürülebilir bir sürecin takip edildiğini belirtmek önemlidir. Bu yaklaşım, Birleşmiş Milletler'in sürdürülebilir kalkınma hedefleri gibi uluslararası düzenlemelerde vurgulanan çevre koruma ve yeşil teknolojiye geçiş amacıyla uyumludur.

Anahtar Kelimeler – Gümüş Nanopartiküller, SERS, Candida Albicans, Patojen Tespiti, Yeşil Sentez.

Comparison of Stick Glue as Forensic Evidence

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Abstract – Forensic document forgery is the examination of a document subject to litigation for forensic purposes using scientific methods. Various evidence such as handwritings, signatures, stamps, seals, paper money, identity documents, passports are included in the field of forensic document examination. In this study, it was aimed to compare stick adhesives on paper as forensic evidence. Within the scope of the study, stick adhesives were evaluated by considering their physical and chemical properties. For this, FTIR is carried out for structural analysis. Moreover, the visualization of the paper stained by glue stick is examined by VSC 8000 under different light sources including UV-A, UV-B, UV-C and spot. For this purpose, a total of 15 stick adhesives (water-based and solvent-based) were analysed using Fourier-transform Infrared spectroscopy (FTIR) and Video Spectral Comparator (VSC). In order to examine the effect of time-dependent changes on the stick adhesives, the stick adhesives applied to the paper surface were kept at time intervals of 1 day, 1 month and 1 week. The application of stick adhesives between different paper surfaces (paper and photo paper) was also analysed. The results have shown that comparison of glue stick could be applied by various analytical techniques which enable for linking suspects to crime scene.

Keywords – Stick Glue, Forensic Evidence, Document, FTIR, Video Spectral Comparator (VSC)

Enhancing Grid Stability and Power Quality: Shunt Active Power Filter Integration with Photovoltaic Systems via Sliding Mode Control

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Abstract – This paper explores the integration of shunt active power filters (SAPF) with photovoltaic (PV) systems, employing sliding mode control (SMC) for improved grid stability and power quality. With the growing adoption of PV systems, grid integration challenges such as harmonic distortion and reactive power compensation have become significant concerns. SAPF, coupled with advanced control strategies like SMC, offers a promising solution to mitigate these issues. This study provides a comprehensive overview of SAPF and PV system architectures, emphasizing the role of SMC in regulating power flow and enhancing system performance. Various control techniques for SAPF-PV integration are discussed, including their advantages and drawbacks. Simulation and experimental results are presented to validate the effectiveness of the proposed approach in reducing grid disturbances and improving power quality. Overall, this paper contributes to the advancement of renewable energy integration by offering insights into the design and implementation of SAPF integrated with PV systems controlled by SMC.

Keywords – Shunt Active Power Filter (Sapf), Photovoltaic System, Sliding Mode Control (Smc), Grid Stability, Power Quality.

Integration of Shunt Active Power Filter with Photovoltaic Systems Controlled by Sliding Mode Control: A Comprehensive Analysis

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Abstract – This work presents a comprehensive examination of the integration of a shunt active power filter (SAPF) with a photovoltaic (PV) system employing Sliding Mode Control (SMC) for efficient power management. The increasing penetration of PV systems in the grid has raised concerns about power quality issues such as harmonic distortion and reactive power compensation. To address these challenges, the utilization of SAPF, combined with advanced control strategies like SMC, has emerged as a promising solution. This paper aims to provide a detailed overview of the key components and operation principles of SAPF and PV systems. It delves into the fundamentals of SMC and its application in regulating the power flow within the system. Furthermore, various control techniques for SAPF-PV integration are analyzed, highlighting the advantages and limitations of each approach. Additionally, simulation results and experimental validations are presented to demonstrate the effectiveness of the proposed system in enhancing power quality and grid integration of PV systems. Overall, this paper offers valuable insights into the design, implementation, and performance evaluation of SAPF integrated with PV systems controlled by SMC, contributing to the advancement of renewable energy technologies and grid stability.

Keywords – Shunt Active Power Filter (SAPF), Photovoltaic System, Sliding Mode Control (SMC), Grid Stability, Power Quality.

SmartHomeMate: An ESP32-Powered Mobile Application for Real-Time Monitoring and Remote Control of Home Appliances and Environmental Conditions

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Abstract – In this era of interconnected devices and remote-control technologies, the development of smart applications for monitoring and controlling home appliances and environmental conditions has become increasingly prevalent. This article presents an innovative smartphone application designed to facilitate real-time monitoring and remote control of temperature, humidity, power consumption, and lighting systems using an ESP32 microcontroller platform.

The application provides users with a comprehensive interface that enables continuous data visualization through dynamic graphs and charts displaying environmental parameters. Additionally, the app empowers users to remotely control connected devices, such as lights, from any location with internet access. Leveraging the robust capabilities of the ESP32 microcontroller, the app offers scalability, allowing for the integration of multiple sensors and devices to cater to diverse smart home automation needs.

Key features of the app include:

Real-time monitoring of temperature and humidity levels with graphical representation.

Measurement and visualization of power consumption trends.

Seamless remote control of connected lights and appliances.

Accessibility and control via the internet, providing flexibility and convenience to users.

The implementation of this app underscores the fusion of IoT technology with user-friendly mobile applications, enhancing convenience, efficiency, and sustainability in smart home environments. Future enhancements may include broader sensor integration, machine learning algorithms for predictive analysis, and enhanced security measures to fortify user privacy and data integrity.

This article contributes to the discourse on IoT-enabled applications and showcases a practical solution for empowering users with smart home automation capabilities. The app demonstrates the potential of leveraging ESP32 microcontrollers and mobile platforms to create intuitive, accessible, and impactful IoT solutions for modern living.

Keywords – Remote Monitoring, ESP32, Internet of Things (IoT), Environmental Monitoring, Smart Home.

IoT-Based Smart Home Monitoring and Control System Utilizing ESP32 Microcontroller

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Abstract – The advent of Internet of Things (IoT) technologies has revolutionized the concept of home automation, enabling seamless monitoring and control of various household parameters remotely. In this paper, we present an innovative IoT-based smart home monitoring and control system designed to enhance convenience, energy efficiency, and overall home management.

The cornerstone of our system is a bespoke mobile application that facilitates real-time monitoring and graphical representation of key environmental metrics including temperature and humidity. Additionally, the application provides users with the ability to monitor power consumption trends, promoting energy-conscious behavior and cost savings.

Integral to the system is the utilization of ESP32 microcontroller, renowned for its versatility and reliability in IoT applications. Through the ESP32, users can remotely control lighting fixtures within their homes, thereby fostering an environment of enhanced comfort and security.

Furthermore, the scalability of the system allows for seamless integration of additional devices, ensuring adaptability to evolving user needs and preferences. With the ubiquity of internet connectivity, users can exercise control over their smart homes anytime, anywhere, enhancing convenience and flexibility in home management.

Through rigorous testing and validation, our system demonstrates robust performance, reliability, and scalability, positioning it as a promising solution for modern smart home applications. This paper not only contributes to the growing body of knowledge in IoT-based home automation but also underscores the potential of ESP32 microcontroller in enabling efficient and user-friendly smart home solutions.

Keywords – Remote Monitoring, ESP32, Internet of Things (IoT), Environmental Monitoring, Smart Home.

Application of Multiple Binary Logistic Regression Model for Forecasting Hepatitis A Immunization Rates

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Abstract – In 1986, all children aged 10 to 14 in Sétif, Algeria, were immune to hepatitis A. This rate dropped to 70.4% in 2011. In response to this situation, a study using the "Multiple Binary Logit" model was conducted to estimate the immunization rate in 2024 from data collected in 2011. The Binary Logit model was evaluated based on the pseudo-determination coefficient R^2, the Hosmer & Lemeshow goodness-of-fit test, and the confusion matrix. The results indicate that in 2024, the overall immunization rate for 5 to 19-year-olds is expected to reach 67%. The null hypothesis of Hosmer and Lemeshow's 'goodness of fit' is accepted (significance level = 98.70%). Therefore, the model can be considered satisfactory. These results suggest that the implementation of a vaccination program could be an effective strategy to combat hepatitis A in our region.

Keywords – Multiple Binary Logistic Regression Model, hepatitis A immunization, Forecast 2024, Risk factors, Algeria.

Sensitivity Analyses of DLVO theory in Fractured Media: Impact of Ionic Strength and Particle Size

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Abstract – When it comes to various environmental problems, such as groundwater contamination, as well as industrial applications, such as oil recovery, understanding the behavior of particle attachment in fractured media is fundamental. The current study uses the DLVO (Derjaguin, Landau, Verwey, and Overbeek) theory in conjunction with sensitivity analysis in order to examine the effect of ionic strength, particle size, and Hamaker constant on the energy interaction between particles and walls. Through the utilization of the spherical particle-plate DLVO model, the findings indicate that elevating the ionic strength results in a decrease in the energy barrier and an increase in the primary minimum depth, thereby facilitating the attachment of particles to the surface. Instead, an increased energy barrier is observed with increasing particle size, which prevents large particles from attaching to the fracture surface. This is in contrast to the situation described above. There is a relationship between the Hamaker constant and the particle-wall interaction. Increasing the Hamaker constant under unfavorable attachment conditions results in a reduction of the energy barrier and a deepening of the primary minimum; this behavior is more pronounced under favorable attachment conditions. This study provides insights regarding the combined role that ionic strength, particle size, and particle-surface-liquid parameters play in governing the behavior of particle attachment in fractured media.

Keywords – Ionic Strength, Particle Size, Hamaker Constant, DLVO, Attachment.

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How effective is swimming in rehabilitating communication skills for individuals with stutter

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Abstract – The study aimed to reveal the role of swimming in rehabilate the communication ability of a child who stutters by relying on a group of respiratory and airobic exrcices and the technic of relaxation over water and from it to identify the effectivness of this process in the algerian clinical stetting and according estimate the number of study cases their age ranges from 08 to 12 years from the state of mostaganem they were chosen intentionally.

Collecting informations we used some tools including observation and interviews the semi –expérimental was used as the results showed a sharp decrease of interuption and repetitions in the 06 cases confidence by boosting the self confidence there is no fear or anxiety

Accordingly ,we discovered that swimming and a set of respiratory exercises applied in the water environnement have an effective role in alleviating the severity of stuttering in the child .

Keywords – Swimming, Rehabilitating, Relaxation, Stuttering and Communicative Ability

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The Pharmaceutical Drug Classification using Deep Learning Approaches

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Abstract – Accurate drug classification through deep learning approaches enhance medication safety by minimizing errors in drug identification and dosage, ultimately safeguarding patient health. These advanced techniques provide a promising solution to prevent the risks associated with incorrect medication use, ensuring that patients receive the most effective treatment for their condition. Patients may face serious consequences due to improper medication use, including errors in taking the wrong drug or incorrect dosage. In order to mitigate the risk of human error in identifying medications, we employed advanced deep learning models such as Convolutional Neural Networks (CNN), VGG19, and Inception-ResNetV2. These models were trained using a comprehensive dataset comprising over 7000 labeled drug images. Through our study, we achieved a remarkable validation accuracy of 95\% utilizing the CNN model. This demonstrates the potential effectiveness of employing deep learning techniques in accurately classifying drug images, thereby reducing the likelihood of medication errors and improving patient safety.

Keywords – CNN, Inception ResNetV2, VGG19, Deep Learning, Drug Classification

Characterizations of Algerian phosphate ores and their exploitation in the preparation of phosphoric acid

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Abstract – In this work, the physicochemical and petrographic characterization of phosphate ore deposits in Kaf El-Son in the Jebel Onk Basin was study with the possibility of preparing phosphoric acid. The crystal structure, chemical composition and morphology of phosphate powders was determined by X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), electron microscopy (SEM) and optical microscopy (OM). All analysis showed that crude phosphate is composed of fluorapatite, dolomite,calcite and quartz. The mean size of the crystals was 26 nm in a disorganized shape. Infrared spectroscopy displays the nature of the functional groups that are present in the phosphate ore and confirm the result analysis DRX. Phosphoric acid was obtained from dissolution of Jbal Enk phosphate ore using sulfuric acid. Optimal P_2O_5 recovery of phosphate rocks obtained when using the following parameters: reaction time 60 min, reaction temperature 60˚C, stirring speed 300 rpm and phosphate particle size < 90 µm.

Keywords – Phosphate Rocks; Sulfuric Acid; P_2O_5 Recovery; Phosphoric Acid; Particle Size

The combination of graphene oxide and polyamide for enhancing the conductivity of PA11 composites

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Abstract – 3-D printing is an additive manufacturing (AM) technique for fabricating a wide range of structures and complex geometries from threedimensional (3D) model data. The process consists of printing successive layers of materials that are formed on top of each other. SLS can be categorized in solid state sintering (SSS), liquid phase sintering-partial melting, full melting, and chemically induced binding. SSS is a thermal process that occurs at temperatures between TMelt/2 and TMelt, where TMelt is the melting temperature. In liquid phase sintering-partial melting, usually the binder material becomes liquefied, while structural material remains solid. Polyamide 11 (PA 11) is a high-performance semi-crystalline thermoplastic engineering polymer whose production volume is increasing due to its balanced property profile and the fact that it is produced from natural resources that are renewable in the short term.

Keywords – 3D, Additive Manufacturing, SLS, Polyamide, Graphene Oxide,

Genomic parameters in elderly individuals during the treatment with peptide bioregulator

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Abstract – The course of all stages of ontogenesis, including the aging process, is subject to epigenetic regulation, which is reflected in the subsequent variation of genomic parameters. If in the early stage of development, the change in the state of chromatin ensures normal development, in the later stage of ontogenesis it is associated with a violation of cellular and organismal homeostasis - a decrease in the immune status and level of repair, which leads to a gradual loss of body functions and the development of aging pathologies.

It is known that compaction-decompactization of chromatin caused by methylation (heterochromatinization-deheterochromatinization) is the epigenetic regulator of gene expression, which is responsible for turning genes off and on, because the accessibility of genes to the transcription apparatus depends on these processes.

Genomic parameters changed during the aging process are subject to correction under certain conditions. In this regard, it is appropriate to study geroprotectors - regulatory oligopeptides used in geriatric practice to reduce the intensity of aging processes and prevent aging pathologies. In this regard, special attention is drawn to the study of a new generation of geroprotector drug - thymalin. The drug, which is a synthetic analog of the regulatory peptide present in the thymus, is used to increase immunity. It is known that with increasing age, there is a significant decrease in the size of the thymus and, accordingly, a decrease in the number of its hormones, which affects the body's immune index, therefore, the study of the influence of thymalin on the normalization of genomic parameters changed in the aging process is of particular interest.

Based on this, the aim of this work was to study the regulatory action of the peptide bioregulator - thymalin on the changed genomic characteristics of elderly individuals and its influence on the activity of synthetic processes.

Analysis of the results showed that thymalin does not affect the disturbed genomic parameters, however, it significantly increases the activity of ribosomal cistrons and the frequency of acrocentric chromosome associations, which indicates an increase in the activity of synthetic processes during the action of the mentioned bioregulator.

Thus, the activation of the synthetic processes in the cells upon exposure to thymalin should probably indicate an increase in the immune status.

Keywords – Aging, Heterochromatinization, Genomic Parameters, Thymalin.

Synthesis and Characterisation of different blends of virgin and recycled polyethylene modified by naturel fibres Alfa

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Abstract – The basic idea of this study is to promote a polyethylene recycle and local vegetable fiber (alfa) in the development and characterization of a new composite material. In this work, different size of fiber alfa (<63 microns, between 63 and 125 microns, 125 and 250 microns) were incorporated into the blends (HDPE / recycled HDPE) with different methods elaboration (extruder twin-screw and twin-cylinder mixer). The fiber was modified by sodium hydroxide in order to evaluate the effect of alkaline treatment on the interfacial adhesion and therefore the properties of composites prepared. These were characterized by various techniques: mechanical (tensile and Charpy impact test), Rheological (melt flow), morphological (SEM). The demonstration of the effect of alkali treatment on alfa fiber was examined by FTIR spectroscopy and morphological analysis. The introduction of alfa treated fiber in the (HDPE / recycled HDPE) increased stress, impact strength and Young's modulus on the contrary, the elongation at break decreases. The results of the mechanical properties showed an improvement is better in extrusion twin-screw mixer than two cylinders.

Keywords –Composites, Vegetable Fiber, High Density Polyethylene, Recycling, Alfa, Alkali Treatment, Mechanical Proprieties.

A Historical Analysis of Accounting and Taxation from Ancient Civilizations to Modern Economies

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Abstract – From the dawn of civilization to the complexities of modern economies, the history of accounting and taxation is a journey of human organization and governance. In ancient Mesopotamia and Egypt, rudimentary accounting methods emerged to track trade and administrative transactions, laying the foundation for the systematic recording of financial data. However, it was in Renaissance Italy that Luca Pacioli introduced double-entry bookkeeping, revolutionizing financial reporting and setting the stage for modern accounting principles. As economies expanded during the Industrial Revolution, businesses demanded more sophisticated financial management, leading to the establishment of professional accounting standards and bodies. Concurrently, governments institutionalized taxation to fund public services and infrastructure, marking a pivotal shift in state finance. The 20th century saw the rise of income taxation, enabling governments to redistribute wealth and finance social programs. World wars and economic crises prompted further adaptations in tax policy and accounting practices, shaping regulatory frameworks and international standards. In today's interconnected world, accounting and taxation face new challenges posed by digital currencies, e-commerce, and globalization. Cross-border transactions and tax havens complicate revenue collection, while debates over corporate tax avoidance underscore the need for greater transparency and accountability. Understanding the historical evolution of accounting and taxation is crucial for navigating the complexities of modern finance and informing policy decisions. From ancient ledgers to digital spreadsheets, the history of accounting and taxation is a testament to humanity's quest for order and prosperity.

Keywords – History, Accounting, Taxation, Evolution, Modern Finance.

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Development of Sensor Network Data Analysis Management and Information System for Smart Factories

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***Abstract** –* Nowadays, with the rapidly developing technology, many innovations have entered our lives. One of these technological advancements is Industry 4.0, known as the 4th Industrial Revolution, which is a set of values consisting of the internet of things, internet services and cyber-physical system. The Internet of Things (IoT) is used to send the received sensor data over the internet networks. IoT enables data sharing and centralized control mechanisms without the need for any human intervention. The paper aims to both reduce costs and ensure high efficiency. An intelligent system created with sensor networks written in C# language provides great comfort for the personal usage and company. In Smart Factories, which are equipped with automation systems that enable increased efficiency in production, real-time monitoring and remote control, it is aimed to ensure that the development in any section is achieved from a common point. Smart Factory Management Information System is a computer-based information system that produces management reports by creating and summarizing transaction records of data transferred through the sensors. This system in the Smart Factory provides energy efficiency in response to the growing energy requirements. It also provides person in charge with ease in accessing information, timely access, cost savings and system security. With the system to be built in this study, it is aimed to control the smart system more easily in visual manner and to create a smart factory management and information system that meets the requirements of Industry 4.0 with solid contribution.

Keywords – Industry 4.0, Smart Factory, Sensor, Management and Information System

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Development Of Sensor Network System For Digital Transformation Transfer Laboratory

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Abstract – Along with technological innovations, the internet of things, artificial intelligence and big data, as a result of all these, the "digital age" or "digitalization" processes we have discussed have entered our lives. These concepts emerged in the Industry 4.0 period, which represents the fourth phase of the industrial revolution and is still experienced today. Internet of things (IoT) refers to all systems that can transfer data over a network. In the world of the Internet of Things, the role of human-to-human commands and even human-computer interaction is minimized. The paper aims to provide both cost and high efficiency by using IoT and MQTT. The application was designed with object-oriented programming languages such as Python and C#. In the Digital Transformation Transfer Laboratory, data recorded and transferred through sensors are analyzed. The focus of the paper is on processing data from DHT11 and HC-SR04 sensors, analyzing this data intelligently and monitoring it in different applications. The use of sensor networks provides timely access and convenience in accessing information. With the development of the systems to be designed in the paper, it is aimed to control the smart system in an easier and more visual way and to develop a sensor network system for a Digital Transformation Transfer Laboratory suitable for Industry 4.0 requirements with high original value. In this context, the paper aims to develop a sensor network system for the Digital Transformation Transfer Laboratory that complies with the high value requirements of Industry 4.0 and makes the control of the smart system easier and more visually accessible.

Keywords – IoT, MQTT, Industry 4.0, Sensor, Digital Transformation

Ultrasound modification of H₂O₂-activated carbon as an effective low-cost adsorbent for removal of dye from aqueous solution

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Abstract – Surface modification of the commercial activated carbon from Merck, using both ultrasound at the low frequency of 40 kHz and chemical treatment using H_2O_2 (35%) solution for the removal by adsorption of methylene blue a cationic dye was the aim of this work. The obtained activated carbons were characterized by molecular iodine for microporous texture and methylene blue for mesoporous one showed that activated carbon treated under the effect of ultrasonic waves presents an increased porosity compared to the treated samples. The influence of different experimental parameters influencing the removal rate of methylene blue such as the dose of the adsorbent, the pH, the contact time and the initial concentration was also studied. The modification by H_2O_2 under ultrasound was considerably more effective in enhancing the adsorption of methylene blue for up to 66% at pH=5.5. Adsorption capacities of methylene blue by CA-H_2O_2 (treated activated carbon) and CA-NT (untreated activated carbon), are 1008 mg/g and 335 mg/g respectively. This enhancement can be explained on the one hand by surface modification favoring then the interaction of methylene blue and the carbon surface, and on the other hand by an increase in the adsorbate transfer without any influence on the particle size leading to a slight increase in the external surface and a better access to the pores. Isotherm studies showed that the non-linear Langmuir model describes well the process of methylene blue adsorption on samples modified under ultrasonic effect.

Keywords- Ultrasound, Activated Carbon, Modification, Adsorption, Cationic Dye.

Working Range Optimization of Bearing Discs with 3 Axis Dynamic Testing

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Abstract – All motor vehicles must have braking systems to stop and stabilize the vehicle. Brakes are systems that control the movement of vehicles, slow them down, stop them or fix their position by absorbing kinetic energy. The main parts of the braking system of automobiles are the brake disc, brake pad, piston and brake caliper. Brake discs are a widely used brake type in the automotive field due to their ease of getting rid of heat and providing the same braking torque in both directions of rotation. In this study, the durability and life test of the bearing and hub part of the bearing discs with 3-axis dynamic test is the subject. Test parameters were determined by examining the operating conditions of the brake discs under the vehicle. Dynamic testing was carried out by applying axial, radial and rotational axis loads according to real under-vehicle conditions. During the test, instant cracks, errors and temperatures were monitored. Axial and radial load was given by hydraulic actuators, and rotational movement was given by the engine. In the test system, load and distance limits were defined for the hydraulic actuators, ensuring that the system would stop in case of any error. During the test, load and distance data were monitored and recorded. The temperature monitoring of the bearing and hub section was done via laser sensors. Temperature data measured with laser sensors were collected by taking data second by second. A limit of 99 °C has been placed on the temperature system. If the temperature of the hub and bearing section exceeds 99 °C, the system stops. Axial and radial loads were also recorded in the system second by second and data was collected. 6 samples were tested. According to the test data, the maximum temperature was determined as 41.2 °C and the average temperature was 38.3 °C. In this study, the effect of loads on bearing discs under real under-vehicle conditions was examined. As a result of the tests, all 6 samples completed the test without any errors. Thus, the suitable working range of the part is optimized. In the next process, different bearings will be tested and compared.

Keywords – Brake System, Disc with Bearing, Dynamic Test, Hub, Laser Temperature Sensor

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Enhancing Communication Skills Among Real Estate Negotiators in Malaysia: A Study on Strategies and Impacts

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Abstract – Proper communication plays a vital role in the real state market, and it is in the role of the negotiators to join buyers and sellers together. This study seeks to explore communication skills of real estate negotiators in Malaysia and to find the strategies for their improvement as well as the effects of these strategies. The paper conceptualizes the importance of communications in the process of buying and selling properties, taking into account the peculiar inherent of nations in the Malaysian society and the dynamics in the housing market. The main focus for this study is to identify a strategy for communication skills improvement of real estate negotiators in Malaysia. The mixed methods approach was used in which the surveys and interviews were conducted with real estate negotiators practicing in different areas of Malaysia. The application of the question data talking to workers of the negotiation toolkits is the way census the frequency of communication strategy this tool used by negotiators. Initial findings suggest that although real estate negotiators in Malaysia have basic communication skills, they still have a lot to learn especially in the area of active listening, empathy, and cross-cultural communication. The findings indicate that the negotiators who use approaches that are customized to client requirements and have people-centered communication techniques tend to reach better results in the real estate negotiation process. Furthermore, talking business with your clients and relationship building through trust and empathy is closely related to a positive result.

Keywords – Real Estate Negotiator, Malaysia, Strategies, Impact, Communications

Comparing the Performance of Deep Learning Architectures for Sentiment Analysis

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Abstract – With the advancement of technology, people frequently express their feelings and thoughts in environments such as social media. Natural language processing applications are also very much on the agenda. Thanks to sentiment analysis, inferences can be made by analyzing them. In this study, different methods of emotion classification with deep learning were investigated and applied. IMDb dataset created from movie reviews was used as a dataset. In sentiment classification, four different architectures were applied to the same dataset and compared. As a result of this comparison, it was observed that the 1D CNN model gave the best results. It was concluded that this architecture is efficient and fast for such studies.

Keywords – Deep learning, LSTM (Long Short Term Memory), RNN (Recurrent Neural Network), 1D CNN (Convolutional Neural Network), Emotion Classification

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Elaboration and characterization of new composite material polyamide11/polyaniline for SLS 3D printing

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Abstract – The aim of this work is the development of new composite materials for 3D applications in powder form by in situ polymerization of aniline in the presence of a thermoplastic matrix polyamide 11. For this purpose, a polyamide 11 matrix reinforced by conductive organic polymers and metal oxides has been developed. Four mass percentage of monomer (1 %, 5 %, 7 %, 10 %) have been used. The effects of the concentrations of polymers and oxides on the physicochemical, electrochemical and morphological properties are studied by spectral analysis (UV), electrochemical analysis (EIS). Our results clearly indicate the formation of composite materials by the displacement of certain band and the appearance of new band in the UV-vis spectrum allowed us to calculate the gap energy of different materials and which showed a remarkable decrease in Eg led to an improvement in the conductivity of our PA11 matrix. The electrochemical study showed the formation of electroactive materials.

Keywords – Polyamide 11, Polyaniline, Composite Polymers, Polymer Matrix, Reinforcements

The missing mathematics in high school. Theorems, proofs and geometric constructions.

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Abstract – In the last 30 years, several reforms have been implemented in the Albanian education system. They certainly aimed to improve the education system, especially pre-university education, by improving the school curriculum, teaching and learning methods, infrastructure, teacher training, and the student assessment system. Many curricula and textbooks have been revised, changed, and added to meet the challenges of today's society. The advancement of technology has made it possible to create new materials and interactive teaching methods for a more interesting and attractive school. However, at the end of the day, beyond the good intentions, discussions, and promises, what matters is what the students have learned and what they know. What happens to high school students when they reach their first year of university? What we are witnessing today is that, for quite some time, there has been a growing gap between the knowledge obtained in high school and the knowledge that students should have in their first year at Albanian or European universities. In this article, we will discuss some of the most important elements of mathematics, theorems, and proofs that do not exist anymore in our high school curricula, and in particular the geometry constructions, as well as the impact on students' achievement and results in university.

Keywords – Curricula, High School, Theorems, Proofs, Geometry Construction

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CORPORATE GOVERNANCE AND INNOVATION PERFORMANCE OF MANUFACTURING FIRMS IN NIGERIA

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Abstract – Despite extensive discussions on regulatory agency on the relationship between corporate governance and organisational performance, it is not new that most extant literature and empirical investigations do not provide detailed explanation on relationship between corporate governance and firm innovation performance. Although, some empirical studies revealed that there is negative relationship between the two variables. Thus, this study examined the extent to which corporate governance and organisational performance. The study sampled listed manufacturing companies in Nigeria stock exchange. The source of data was obtained from extracted data on activities of the selected firm period from 2008 to 2017. The method of data analyses for the study are Hausman test, cross sectional panel multiple regression, fixed effect result, random effect, pool effect. These methods are employed to examine the extent of relationship and interaction impact on the selected variables. Descriptive statistics and correlation matrix was used to pre-test the data in order to determine whether they are normally distributed. Thus, the study revealed that positive and significant relationship between board size, board independence and audit committee with firm financial performance. The study further indicated that ownership structure has negative and insignificant relationship with firm financial performance. The study asserted that the dimensions selected for measuring corporate governance mechanism on firm financial performance was adequately observed. The director ownership is quite low at 4% and has an inverse relationship with the performance measures. The average board size is found to be 9 which is in concordance with the Securities and Exchange Commission Code of Corporate Code of Corporate governance. The audit committee is on the average 49% independent which results in an impact on performance based on return on equity and profit margin. The study recommended that member on corporate governance in different companies should carry constantly carry out an audit of compliance on corporate governance as its affect firm financial performance.

Keywords – Good Governance, Organizational Performance, Manufacturing Firms.

Molecular phylogeny of *Linaria* Mill. (Plantaginaceae) from Türkiye based on nuclear internal transcribed spacer (nrITS) sequences

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Abstract –Linaria has over 200 taxa in the world and classified in Antirrhineae tribe of the Plantaginaceae family. According to Turkish Plant List, *Linaria* has 31 taxa, 12 of which are endemic. It is a taxonomically complex and problematic genus. In this study, it was aimed to reveal the phylogenetic relationship of Türkiye's *Linaria* taxa according to nrITS sequence data. During field studies, we collected *Linaria* leaves in silica gel. Qiagen Dneasy mini kit was used for extraction of DNA for molecular studies. Outgroups and additional *Linaria* taxa retrieved from GenBank based on previous molecular studies on the genus. Phylogenetic trees were generated using CIPRES (RAxML and MrBayes) based on Maximum Likelihood (ML) and Bayesian Inference (BI) analyses. As a result of the study, it was revealed that *Linaria* taxa grow in Türkiye is a monophyletic group and we solved species relationships based on ITS sequences.

Keywords – ITS, Linaria, Phylogeny, Plantaginaceae, Türkiye

Kinetic study of the acrylic acid radical polymerization by gravimetric method

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Abstract – This work focuses on the experimental determination of the kinetic parameters. The reaction studied is the radical polymerization reaction of acrylic acid (AA), initiated by azobisisobutyronitrile (AIBN). The kinetics monitoring is carried out using the gravimetric method. The effect of different factors on the overall kinetics is studied, such as the temperature, the monomer concentration, and the initiator concentration. The established kinetic model features simplicity and quick determination of the overall kinetic constant K_{Poly} as well as the exponential factor A_{Poly} and the activation energy E_{Poly}. The obtained results are consistent with those found in relevant literature. The study conducted can be exploited in preventing thermal risks associated with such highly exothermic reactions by determining the parameters of the thermal runaway scenario, aiming to ensure safe operation of polymerization processes.

Keywords – Radical Polymerization, Acrylic Acid, Kinetic Parameters, Gravimetric Method, Thermal Runaway

Investigating the Effects of Climate Change on Camel Biodiversity in Algeria

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Abstract – Renowned for their resilience in harsh environments, camels are now grappling with the consequences of climate change on their biodiversity. Escalating temperatures and shifting precipitation patterns are leading to diverse impacts on camels and their habitats. Climate-induced alterations in vegetation cover and water availability are causing habitat loss and fragmentation, particularly in arid and semi-arid regions experiencing desertification and water source depletion. This loss of habitat not only makes it challenging for camels to locate resources and mates but also contributes to the fragmentation of camel populations. Moreover, elevated temperatures increase the prevalence of diseases like heat stress and dehydration, while fluctuations in temperature and humidity levels affect the availability of suitable forage, impacting camel nutrition and health. Changing climatic conditions may necessitate revisions to traditional migration routes, leading to conflicts with human activities and encroachment into new territories, where competition with other species may arise. Furthermore, climate change threatens the genetic diversity of camel populations by limiting access to diverse habitats and resources, potentially leading to inbreeding and reduced genetic variability. Despite evolving unique adaptations, camels face challenges in coping with rapid climate-induced changes, including extreme weather events like droughts and flash floods. Overall, climate change poses significant threats to camel biodiversity through habitat loss, health impacts, altered migration patterns, reduced genetic diversity, and adaptation challenges. Conservation efforts aimed at preserving camel habitats, promoting genetic diversity, and monitoring climate change impacts are essential.

Keywords – Biodiversity, Camel, Climate Change, Genetic Diversity, Temperatures.

Static analysis of FGM plates using strain based finite element

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Abstract – In this paper, we have used a four-sided finite element model on the basis of the strain approach. It has five basic degrees of freedom at each of the four nodes of the element. The element used is SBQP20, which consists of three displacements and two rotations. This element is the result of the superposition of two elements: the membrane element is the first element with two degrees of freedom per nod, and the second element is the Reissner Mindlin plate, which has three degrees of freedom per nod. We have studied the statics of different shapes of square and rectangular plates. These plates are made of functionally graded materials (FGM), and they have been subjected to a number of boundary conditions and variations in thickness and area.

Assume graded material properties across the thickness direction of the plate by means of a simple power-law distribution of the components of the volume fractions.

After carrying out several tests and detailed numerical studies on how the thickness and aspect ratio of the plate, as well as the gradient index, affect the static response of the graded material plates, their results are compared with the results of other elements found in the literature. The numerical results showed the good accuracy and efficiency of the current element in predicting the bending of FGM plates.

Keywords – Function Graded, Static, Boundary Condition, Finite Element.

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Evaluating the Impact of Data Augmentation on Recommender Systems Performance

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Abstract – This study investigates the influence of data augmentation on the performance of recommender systems, employing both collaborative filtering (CF) and content-based filtering (CBF) methods. Using the MovieLens dataset, we systematically applied various data augmentation techniques to enrich the dataset and evaluate their effects on key performance metrics: accuracy, precision, and recall. Our experiments demonstrate significant improvements across these metrics with data augmentation, indicating enhanced prediction accuracy and recommendation relevance. The findings highlight the crucial role of data augmentation in addressing data sparsity and enhancing the robustness of recommender systems. Through this research, we provide insights into effective strategies for data preprocessing that can be employed to improve the quality and effectiveness of recommendations in various applications.

Keywords – Recommender Systems, Data Augmentation, Collaborative Filtering, Content-based Filtering, MovieLens

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Küresel İklim Değişikliğiyle Mücadelede CO2 Yakalama Teknolojilerinin Rolü ve Geleceği

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Özet – Sera gazı emisyonlarının baş aktörü CO2 dir. Küresel iklim değişikliğini kontrol altına almak ve Paris Anlaşması hedeflerine ulaşmak için CO2 yakalama teknolojilerinin yaygınlaştırılması hayati bir gerekliliktir. Uluslararası Enerji Ajansı verilerine göre, doğrudan endüstriyel CO2 emisyonlarının 2060'ta yaklaşık 10 GtCO2 seviyesine yükseleceği tahmin ediliyor. CO2 emisyonlarının azaltılması için halihazırda kullanılan karbon yakalama yöntemleri, yanma sonrası karbon yakalama, yanma öncesi karbon yakalama ve oksiyakıt yanma teknolojileridir. Karbon yakalama ve depolama (KYD) yöntemleri henüz tam olarak olgunluk seviyesine ulaşmamış olmaları, maliyet belirsizlikleri ve depolama kaynaklı çevresel riskler gibi belirsizliklere sahiptir. Ayrıca, politik taahhüt eksiklikleri de bu belirsizliği arttırmaktadır. KYD teknolojileri halihazırda karbon kaynağı olan endüstriyel tesislerden oluşan karbonu uzaklaştırmaktadır. Havadan direkt CO2 yakalama sistemleri ise havada serbest olarak mevcut olan CO2'yi direkt olarak absorbe eden mekanik sistemlerden oluşur ve KYD teknolojilerine yeni bir alternatif olarak kabul edilir. Bu çalışmada mevcut CO2 yakalama teknolojileri, gelecekle ilgili projeksiyonlar, yeni teknolojiler ve zorlukları ile ilgili mevcut durum analizi yapılmıştır

Anahtar Kelimeler – CO2 Yakalama Teknolojileri, Sera Gazı Emisyonları, Havadan Direkt CO2 Yakalama

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Büyük Yolcu Uçaklarındaki Kokpit Kapısı Kilit Sisteminin İncelenmesi

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Özet –11 Eylül 2001'de Amerika Birleşik Devletleri (ABD)'ndeki ikiz kulelere yapılan terör saldırıları, havacılık ekonomisini ve insanların bu ulaşım aracına olan güvenini sarsmıştır. Bu durum, benzer olayların yaşanmaması adına sivil havacılık kuruluşlarının hızlı tepki vermesine neden olmuştur. Örneğin ABD'deki Federal Havacılık İdaresi (Federal Aviation Administration, FAA), yetkisiz kişilerin kokpite girişlerini önlemek için kokpit kapısının acilen güçlendirilmesi gerektiğine dair karar almıştır. Ayrıca yeni güvenlik kuralları kapsamında kokpit kapılarının uçuş sırasında kapatılması ve kilitlenmesi zorunlu kılınmıştır. Ticari havayollarının operatörleri de uçaklarının kokpit kapılarını yetkisiz kişilere, hafif silah ateşine ve bazı el bombalarına dayanacak şekilde kuvvetlendirmiştir. Bu tedbirler kapsamında kokpit kapısının güçlendirilmesi dış kaynaklı terör eylemlerinin önüne geçmede caydırıcı rol üstlenmiştir, ancak pilot kaynaklı bazı sorunları da beraberinde getirmiştir. Yapılan bu çalışmada öncelikle geçmişte yaşanmış olan pilotların intihar düşüncesiyle kasten uçak düşürme vakaları özetlenmiş, ardından günümüz yolcu uçaklarındaki kokpit kapısı kilit sistemi incelenmiş, nihai olarak bu tür intihar vakalarını önlemek için bir çözüm önerisinde bulunulmuştur.

Anahtar Kelimeler – Uçuş Güvenliği, Kokpit Güvenliği, Kokpit Kapısı, İntihar Uçuşu, Airbus.

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Soğuk sıkım yöntemi artığı olan çörek otu posalarının süperkritik CO_2 ekstraksiyon ile maksimum yağ verimi noktasının optimizasyonu

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Özet – Çiçekli bir bitki olan çörek otu (Nigella sativa L.) Orta Doğu, Batı Avrupa, Doğu ve Orta Asya'da yaygın şekilde yetişen "Ranunculaceae" familyasına aittir. Çörek otu posası ise, soğuk pres ekstraksiyon yöntemi ile yağın alınması sonucu artık olarak elde edilir. Genellikle artık olarak kabul edilen bu posa, aktif karbon ve boyar madde imalatlarında kullanılabilmektedir. Bu araştırmada, endüstriyel çörek otu yağı üretim prosesinin artık ürünü olan çörek otu posasından katma değerli yeni ürün eldesi amaçlanmıştır. Ticari değeri göz ardı edilen bu artığın halen yüksek yağ verimine sahip olduğu, kullanılacak ileri ekstraksiyon teknikleri ile ticari değere sahip ürün eldesinin mümkün olduğu bu çalışma ile tespit edilmiştir. Bu amaçla deneysel tasarım yazılımı olarak Design Expert 12 programı kullanılmış ve bağımsız parametreler olan sıcaklık (°C), basınç (bar), karbondioksit (CO_2) akış hızı (L/dk) ve kosolvent oranının Sc-CO_2 ekstraksiyonu verimine etkileri araştırılmış ve maksimum yağ eldesi için gerekli şartlar 70 °C, 220 bar, %8 Etanol, 120 min süre, 3 L/min CO_2 akış hızı olarak bulunmuştur. Deneysel sonuçlar çörek otu posasından ağırlıkça %34,84 lük yağ verimine ulaşılabildiğini göstermiştir. Çörek otu soğuk sıkım yağ eldesi yağ oranın %20-30 arasında olduğu değerlendirildiğinde bu çevreci yöntemle posalardan tekrar yağ üretmenin ne kadar sağlıklı ve değerli olduğu görülmektedir.

Anahtar Kelimeler – Çörek Otu Posası, Süperkritik Ekstraksiyon, Deneysel Tasarım, Kosolvent, Yağ Verimi.

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Varlık İsmi Tanıma Probleminin Sosyal Ağlarda Reklam Sistemine Uyarlanması

Adaptation of Named Entity Recognition Problem to Advertising System in Social Networks

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Özet – Sosyal ağlarda reklam sisteminin yaygınlaşmasıyla içeriklerden anlam çıkarılma ihtiyacı artmıştır. Bu çalışma kapsamında da forum temelli sosyal ağ platformları için kullanıcıların yazdıkları metinlerden yararlanılarak akıllı bir reklam sisteminin ortaya çıkarılmasına destek olunmaktadır. Geliştirilen sistem, Varlık İsmi Tanıma (Named Entity Recognition) teknikleri kullanılarak, metinlerdeki ürün adlarını ve bunların ait olduğu kategorileri tanımlamak için tasarlanmıştır. Metinlerin vektörleştirilmesi için de BERT mimarisinden yararlanılmaktadır. Bu sayede, forum temelli sosyal ağ platformlarındaki kullanıcılar tarafından paylaşılan içeriklerde yer alan ürünlerin ve kategorilerin otomatik olarak tespit edilmesi mümkün hale gelmiştir. Çalışma sonuçlarının, pazarlama ve reklam stratejileri için faydalı olacağına inanılmaktadır.

Anahtar Kelimeler – Varlık İsmi Tanıma, İsim Varlık Tanıma, Reklam Sistemi, Sosyal Ağ, BERT.

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Perspectives of Participation of Migration Processes in the Enterprise Economy

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Abstract – The paper summarises the theoretical foundations and practical provisions on the mechanisms of influence of migration processes on the sustainable development of the enterprise economy (in the case of Azerbaijan).

In the process of assessing the prospects for the participation of migration processes in the enterprise economy, the opportunities, and obstacles that migration processes create in the development of enterprises are revealed. It is established that for Azerbaijan, migration provides new opportunities related to reducing the cost of labour and reducing the expenses associated with its use. The negative consequences of migration are mainly manifested in countries where emigration prevails. It also describes the possibilities of migrants to establish their own business in Azerbaijan. It is noted that migrants can open different types of legal entities, and the investment climate in the country will contribute to the development of such enterprises. Based on the correlation analysis, there is a direct link between migration and economic development indicators in Azerbaijan. Regression analysis confirmed the significant positive impact of migration and economic development indicators. The study of the Ease of Doing Business Index values confirmed that Azerbaijan has created a favourable environment for entrepreneurial activity. As a result of the analysis, recommendations were developed for further expanding opportunities for immigrants to strengthen their positive impact on the enterprise economy in Azerbaijan.

Keywords – Migration, Labour Migrants, Entrepreneurship, Sustainable Development, Innovation, Ease Of Doing Business, Investment Climate

Solar Energy Potential in Adana: Integrating Solar Panels in Agriculture for Sustainable Energy Solutions

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Abstract – This study explores the solar energy potential in Adana, a city in the Mediterranean region of Turkey, with a focus on integrating solar panels in agriculture for sustainable energy solutions. Adana's warm, sunny climate and high energy demand due to its significant population and industrial activities make it an ideal candidate for renewable energy integration. Using the 4E's analysis framework (energy, exergy, economy, and environment) and RetScreen Software, we conducted a comprehensive analysis to demonstrate the viability of investing in solar energy resources in Adana. Our study aims to provide a techno-economic assessment of different solar technologies, simulation results of solar power generation, and an evaluation of the ethical, environmental, and social impacts. Additionally, we will examine the potential applications of solar energy in agriculture in Adana, emphasizing the enhancement of agricultural productivity and the resilience of the healthcare system. The literature review underscores the growing global momentum toward solar energy adoption and highlights specific studies that have analyzed the potential of solar energy in Adana across various sectors. This research contributes to the understanding of solar energy integration in Adana and offers insights for future sustainable energy initiatives in the region.

Keywords – Sustainable Energy, Solar Potential, Energy Demand, Agrivoltaics, and Exergy.

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Global existence of solutions for a parabolic type system

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Abstract – In this work, we consider the global existence of solutions for a coupled parabolic system with logarithmic nonlinearity. The parabolic type equation is a type of evolution equations. Evolution equations, defined as partial differential equations where time t serves as one of the independent variables, emerge as fundamental constructs across various mathematical and scientific domains. They find applications not only within mathematics but also extend their influence into diverse fields such as physics, mechanics, and material science. For instance, equations like the Navier-Stokes and Euler equations, fundamental in fluid mechanics, delineate the dynamics of fluid flow, crucial for understanding phenomena ranging from airflow over an airplane wing to ocean currents. Similarly, nonlinear reaction-diffusion equations feature prominently in the study of heat transfer processes and biological phenomena, offering insights into the distribution of heat and the spread of substances within biological systems. In the realm of quantum mechanics, notable equations such as the nonlinear Klein-Gordon and Schrödinger equations play pivotal roles, elucidating the behavior of particles and systems at the quantum level, essential for grasping the fundamental principles governing the universe's smallest scales. These examples underscore the ubiquitous nature of evolution equations, serving as indispensable tools for modeling and comprehending complex phenomena across disciplines.

Keywords – Global Existence, Parabolic-Type Equations, Logarithmic Source, Energy Identity.

SAFe® - Lean Map: A Systematic Mapping Study between SAFe® and Lean Production

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Abstract – Scaled Agile Framework® (SAFe®), one of the recent agile frameworks, aims to spread agile methods across organizations as many other large-scale frameworks. Featured with strongly documented standards, flows, and release trains at different levels which synchronize different teams and groups of teams, the framework has been among the most preferred methodologies for the last few years in terms of usage volume. Through case studies and experiences of practitioners in the academic literature, the framework has evolved over the years and has reached version 6.0. Many upgrades have been committed to including strategic patterns, budgeting, portfolio management, value streams, several configurations for framework setup, and a lean quality mindset. The fact that the leading concept in recent versions is "lean" requires questioning the relationship between the Toyota Way (TW) and Total Quality Management (TQM). In this study, a systematic review of the relationship between SAFe and lean production (LP) was conducted in the first stage by taking base of a ready characteristic set of LP, then terminological mappings were tried to be found by conducting separate reviews for each lean production sub-element. The resulting set can be used as input in subsequent studies and can lead the way to the detailed stage.

Keywords – Scaled Agile Framework, Large Scale Agile, Total Quality, Toyota Way, Lean

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Nomex (Bal Peteği) Kompozit Malzemesinin Frezelenmesinin Araştırılması

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Özet – Kompozit malzemeler, farklı yapısal özelliklere sahip iki veya daha fazla malzeme bir araya getirilerek oluşturulmuş malzemelerdir. Bu malzemeler genellikle bir matris ve güçlendirici lifler veya dolgu maddeleri içerir. Kompozitlerin özellikleri, kullanılan bileşenlerin seçimine ve düzenlenmesine bağlı olarak değişir. Bal peteği geometrisinde üretilen Nomex, özellikle havacılık ve uzay çalışmaları, denizcilik, otomotiv gibi sektörlerde yaygın olarak tercih edilen; yüksek mukavemet, hafiflik ve yanmazlık gibi üstün özellikler sunan malzemelerdir. Çekirdek yapısı kare prizma, altıgen prizma gibi çeşitli geometri ve ölçülerde üretilebilir ancak anizotropik yapıları nedeniyle işlenme süreçleri oldukça karmaşıktır. Bu tür kompozitler genellikle perçin ve cıvata gibi bağlantı elemanlarıyla birleştirilirler. Bağlantı elemanlarının yuvaları için yahut istenen bir yüzeyi elde etmek için CNC frezeleme işlemi gerçekleştirilir.

Bu araştırmada, CNC frezeleme işlemi sırasında meydana gelen kesme kuvvetleri ve işlem sonrası oluşan delaminasyonlar incelenmiştir. Bu araştırmanın amacı, en uygun kesici takım geometrisi, fener mili hızı ve ilerleme hızını belirlemektir. Deneylerde camfiber prepreg kaplı Nomex balpeteği sandviç malzeme kullanılarak, helisel üç ağızlı (RRFE060) ve iki ağızlı kırıcı tip (RCFE060) kesici takımlarla çalışılmıştır. İşleme merkezinde kanal açma metodu kullanılarak farklı ilerleme hızları (150, 300, 450, 600, 750 mm/dk) ve fener mili hızlarıyla (2500, 7500 dev/dk) işlemler gerçekleştirilmiştir. Kesme kuvvetleri dinamometre ile ölçülmüş ve açılan kanalların görüntüleri üzerinden delaminasyon sonuçları yorumlanmıştır. Genel olarak fener mili hızı 7500 dev/dk iken kesme kuvvetlerinin ve kesilmemiş fiber sayısının gözle görülür şekilde azaldığı gözlemlenmiştir. Bunun yanı sıra ilerleme hızı arttıkça delaminasyonların sıklaştığı ve kesme kuvvetlerinin arttığı görülmüştür. Ayrıca RRFE060 kesici takımla gerçekleştirilen işlemede RCFE060'a göre kesme kuvvetleri daha yüksek çıkmıştır.

Anahtar Kelimeler – Kompozit, Nomex, Bal Peteği, İşlenebilirlik, Frezeleme

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Facile synthesis and Properties Study of CdS Thin Films for Heterojunctions Photovoltaic Cells Fabrication

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Abstract *– The aim of this work consists on the one hand to synthesize and characterize the structural, morphological and optical properties of cadmium sulfide (CdS) thin films and on the other hand to study the effect of deposition time on the physicochemical properties of these films. These II^BVI^A semiconductor thin films were prepared by "chemical bath deposition (CBD)"; facile and inexpensive deposition technique; onto glass substrates by varying the deposition time from 15 to 45 min and keeping the deposition temperature fixed at 60 °C. The growth kinetics study of the CdS films revealed that the film thickness increases with increasing deposition time. XRD structural analysis shown that the prepared CdS thin films have a cubic, hexagonal, orthorhombic, or mixed polycrystalline structure. The crystallite was found to vary inversely with the microstrain as a function of the deposition time. SEM study of surface morphology revealed that increasing of the deposition time improves the density and surface homogeneity of the films. Optical analysis has exhibit that all of thin films have a high transmittance varying in the range of 60-85% depending on the deposition time. Direct bandgap of these films was found to be between 2.2 and 2.4 (eV) as function of deposition time. The optical bandgap and the Urbach energy have opposite behaviors depending on the deposition time. As a result, this study confirmed that the film deposited at 25 min has good structural, morphological and optical properties allowing it to be used as a buffer layer in heterojunctions photovoltaic cells.*

Keywords – Thin Films, Cadmium Sulfide, Chemical Bath, Morphological Properties, Optical Properties.

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MORE THAN JUST HOOLIGANS: EXPLORING FOOTBALL FANDOM OF THE MALAYSIAN FOOTBALL FANS

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Abstract – This study explores the significance of social identity theory in explaining the routine and habitual processes of fans' lives in becoming football fans. Football fans' personal characteristics and experiences relate to one another and strengthen their identity through identification, association, and affiliation within the group. Enhancing an understanding of the fans and essential connections between fandom, fidelity, and football is paramount to further understanding how fandom is practised and leads to understanding how fandom works. Meanwhile, the Malaysia Super League offers an exciting platform to examine fans' mundane experiences watching and supporting football. Through focus group analysis, general psychographics of football fans, their fandom patterns and practice will be identified, and at the same time, explore how fandom and fidelity are created. The results support that football fans attain vicarious achievements by being identified as loyal fans. The more identified a football fan is, the more likely they will find ways to demonstrate their fandom and fidelity publicly, for example, attending live matches at the stadium, wearing the jersey, and purchasing the branded merchandise of the club.

Keywords – Fandom, Fidelity, Fans, Social Identity, Para-Social Relationship.

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Migration Management Policy and Strategy: The Case of Azerbaijan

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Abstract – Migration significantly affects economic, social, cultural, and political factors of the country. Owing to this situation, it can be said that the reasons of migration should be analyzed to control such problems. The purpose of this study is to determine the influencing factors of the global challenges, migration management policy and strategy used commonly in developed and developing countries as well as domestic and international migration management in Azerbaijan. According to the results of the most research papers, it was identified that people prefer to move to other countries in case of high unemployment rates. In addition, the results showed that population growth and high mortality rate increases the migration level. While considering these results, it was recommended that Azerbaijan should focus on these aspects to control international and domestic migration problems.

By performing this research, we will be able to know the significant impacts of international and domestic migration management policy and strategy in Azerbaijan and the challenges that effects in order to manage and develop a better strategy. By results of our findings from this research then we will be able to find what are the main challenges of international and domestic migration in Azerbaijan and considering those ways we can draw some immediate alternative policies and take some necessary actions in order to overcome it, which will definitely help the republic to grow its managerial and strategical impacts and to transform the republic of Azerbaijan from a developing country to a developed country.

Keywords – Migration; Domestic Migration, International Migration; Determinants of Migration; Challenges of Migration and Strategies

Approximation solution of partial differential equations with fractional order

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***Abstract** –* In this study, we give approximate solutions of fractional order partial differential equations. To do this, we use a widely used numerical method. This technic reconstructed with the help of newly defined conformal derivative for fractional analysis. We first introduce some fundamental features of the method, some theoretical knowledge and then we apply it to some fractional order partial differential equations. Finally, understandig to reliabilty and consistancy of the given method, we give some graphs with related numerical solutions and exact solution of the sample problems related with some different fractional order.

Keywords – Fractional Derivative, Fractional Differential Equations, Conformable derivative, Conformable Partial Differential Equations, Appoximation Method

Otobüslerde Lazer Kaynak ile Birleştirme Üzerine Nümerik Bir İnceleme

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Özet – Otomotiv endüstrisi günümüzde çok sayıda ülke sanayisinin en önemli ekonomi unsurudur. Gerek kara ulaşımının her geçen gün artmasıyla gerekse nüfus artışlarıyla beraber otomotiv endüstrine talep artmış ve böylece birçok ülkede gerek otomobil gibi binek taşıtlara gerekse otobüs, minibüs, kamyon, tır gibi yük ve yolcu taşıtlarına yönelik ana üretici ve tedarikçi firmalar kurulmaya başlanmıştır. Kara taşıtları binlerce alt bileşenlerden meydana gelmektedir. Bu sebeple bu sektör için en önemli üretim proseslerinden biri montajdır. Bunun için yapıştırma, mekanik birleştirme gibi birçok farklı yöntemler olsa da günümüzde kaynak yöntemlerinin kullanımı günbegün artmaktadır. Kaynak yöntemleri arasına en dikkat çekici olanlardan biri otomasyona uygunluğu sebebiyle lazer kaynağıdır. Bu çalışmada paslanmaz çeliğin lazer kaynak metoduyla birleştirilmesi ve buna bağlı olarak kaynak hızı ve lazer gücünün kaynak dikişinin üzerindeki etkilerine simülasyon ortamında nümerik olarak ele alınmıştır. Çalışmada ilk aşama sac parçalarının tasarımı gerçekleştirilmiş olup sonraki adımda mesh yapısı oluşturulmuştur. Yatak ve mengenelerin tanımlamasının ardından kaynak hızı ve lazer gücünün tanımlanması ile model tamamlanmıştır. Bu çalışmada üç farklı kaynak hızı ve iki farklı lazer gücü kullanılmıştır. Çalışma sonucunda 2 kW lazer gücü ile tüm kaynak hızlarında tam penetrasyonun gerçekleştiği gözlenmiştir. Çalışma sonucunda en büyük kaynak dikiş genişliği 10 mm/s kaynak hızı ve 2 kW lazer gücü ile gerçekleştiği gözlenmişken en düşük kaynak dikişi genişliği 30 mm/s kaynak hızı ile 1 kW lazer gücü ile elde edilmiştir. Simülasyon sonuçları genel olarak ele alındığında kaynak dikişi geometrisinde lazer gücünün daha efektif olduğu söylenebilir.

Anahtar Kelimeler – Otobüs, Lazer Kaynak, Kaynak Dikişi, Kaynak Hızı, Lazer Gücü

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Farklı Malzemelerden Üretilmiş Batarya Paketi Taşıyıcısının Performansının Mukavemet ve Maliyet Açısından İncelenmesi

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Özet – Çevre kirliliği günümüzde her geçen gün daha büyük bir sorun haline gelmektedir, gerek akademik kurumlar gerekse sivil toplum kuruluşları bu probleme dikkat çekmek adına çok büyük emekler vermektedir. Çevre kirliliği ana bir başlık olarak ele alınabileceği gibi toprak kirliliği, su kirliliği, hava kirliliği gibi alt başlıklar halinde de incelenebilir. Günümüzde bu kirlilik çeşitleri arasından hava kirliliği en tehlikeli tür olarak ele alınabilir. Zira insan sağlığına çok hızlı zarar verebilmektedir. Bu sebeple hava kirliğini azaltacak çeşitli önlemlerin alınması elzemdir. İçten yanmalı motorlu taşıtlar petrol türevi yakıt tüketmeleri sebebiyle hava kirliliğine sebep olmaktadır. Bu noktada atılabilecek en önemli adım alternatif yakıt tüketen taşıtlara geçmektir. Günümüzde elektrikli taşıtlar bu açıdan büyük önem arz etmektedir. Bu çalışmada elektrikli bir otobüsün batarya paketi taşıyıcı için yapısal çelik ve alüminyum 6063-T6 malzeme kullanımlarının mukavemet ve maliyet açısından kıyaslaması yapılmıştır. Analizler için ilk olarak basit yapılı bir batarya paketi taşıyıcısı tasarlanmıştır. Sonraki aşamada mesh örgüsü oluşturulmuş ve malzeme ataması gerçekleştirilmiştir. Son olarak yapının sınır koşulları ve yüklemeleri tanımlanarak simülasyon modeli tamamlanmıştır. Analiz sonuçları mukavemet açısından ele alındığında gerek yapısal çelik gerekse alüminyum alaşımı için kayda değer bir değişim gözlenmemiştir. Zira her iki malzeme için de gerçekleşen maksimum deformasyon miktarı 1 mm'den azdır. Hakeza her iki malzeme için elde edilen maksimum gerilme değerleri de yine oldukça yakındır. Her ne kadar alüminyum alaşımı özkütle avantajı sayesinde yapısal çeliğe kıyasla % 65,73 oranında daha hafif olsa da birim maliyetinin yüksek olması sebebiyle yapısal çeliğe kıyasla neredeyse 2,5 kat daha maliyetlidir.

Anahtar Kelimeler – Alüminyum, Yapısal Çelik, Batarya Paketi Taşıyıcısı, Mukavemet, Hava Kirliliği

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Detection the genetic polymorphism and gene expression for apoptotic genes in patients with leukemia in Mosul city

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Abstract – Apoptosis is a highly regular process of programmed cell death to remove unwanted and damaged cells. This process occurs due to several stimulations, some of them external, such as DNA damage exposed to UV and toxin and bacteria or virus infection, and also some external stimulation, like the absence of growth hormone apoptosis. Any defect in the process of apoptosis has an association with many diseases, like cancer and autoimmune disorders. The BCL-2 and BAX genes belong to the BCL-2 family. These genes regulate the process of program cell death by inhabiting the process of apoptosis or directing the cell toward death. Leukemia is the most common type of blood cancer in children younger than 15. The characteristics by rapid or slow proliferation of cancer cells depend on the type of leukemia.The objectives of this study are the determination of the genetic variation and detection of the new mutation of BAX and BCL-2 in patients suffering from leukemia in Mosul city.According to the following study, the proportion of kids with leukemia who observed the wild genotype was (20), the proportion of mutant genotypes was (30), and the proportion of heterogeneous groups was 50 compared with the healthy control group. 70% for wild genotype, 20% for the heterogeneous, and 10% for the mutant genotype.

Keywords –Apoptosis, gene of apoptosis, BAX, BCL-2, PCR, mutation, Leukemia, gene expression,q-PCR

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Sentiment Analysis and Rating Prediction for App Reviews Using Transformer-based Models

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Abstract – In this study, we present the sentiment analysis of Spotify app reviews, the implementation of Natural Language Processing (NLP) methods, and the use of transformer-based models including BERT, DistilBERT, RoBERTa, and XLM-RoBERTa. Comprehensive preprocessing, including emoji removal, typo correction, and tokenization, was utilized for processing Spotify app reviews from the Google Play Store. Sentiments were analyzed using the VADER Sentiment Intensity Analyzer, categorized into positive, neutral, and negative. Models were assessed for accuracy, precision, recall, and F1-score. DistilBERT achieved the highest accuracy and recall 71.68%, while XLM-RoBERTa demonstrated the best balance with an F1-score of 69.24% in predicting Spotify app ratings.

Keywords – Sentiment Analysis, NLP, User App Review, Transformer Models, Classification, Rating Prediction

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Üretken Yapay Zeka Teknolojisi: GPT-4o

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Özet – Kasım 2022 ile hayatımıza giren üretken yapay zeka kavramı popülerliğini her geçen gün arttırmaya devam etmektedir. Birçok uygulaması olan üretken yapay zeka uygulamalarından en çok bilineni Chat GPT ile ilgili ise her geçen gün yeni haberler duymaya devam etmekteyiz. 13 Mayıs 2024 itibariyle duyurulan GPT-4o ise bu alandaki en önemli ve son gelişme olarak karşımıza çıkmaktadır. Şöyle ki günlük rutin işlerimizi yaparken, çalışırken, öğrenirken yardım aldığımız Chat GPT; artık bizim yerimize görüyor, bir öğretmen gibi öğretiyor, anlık simultane çeviriler yapabiliyor ve hatta daha da fazlasını da yapabildiğini vaat etmektedir. Chat GPT 3.5 ve ücretli sürüm olan Chat GPT 4'ün eğitimden, sağlığa, finanstan, güvenliğe kadar birçok alan da kullanım örnekleri görülmektedir. Yeni sürüm olan GPT-4o ise insanlara daha hızlı ve daha insani yetenekler sunmaktadır. Bu çalışmanın amacı, GPT-4o ile diğer sürümler arasındaki üstün özellikleri vurgulamak ve dezavantajlarını ayrıntılı bir şekilde incelemektir. Ayrıca örnek promptlar ile yeni özellikler vurgulanacaktır. Bu analiz, üretken yapay zeka teknolojisinin gelecekteki potansiyel kullanım alanlarına dair önemli bir iç görü sunmakta ve bu alandaki akademik literatüre önemli bir katkı sağlamaktadır.

Anahtar Kelimeler – Üretken Yapay Zeka, Chat GPT, GPT-4o, LLM, GPT 4

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Sexual Dimorphism in Zebrafish, Danio rerio, Revealed by Geometric Morphometrics

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Abstract – Recognition of the gender of fish without scarifying and dissecting is almost impossible for the most species. However, sex determination could be very important for the management of, especially, aquaculture stocks as well as natural fish stocks. This study was carried out on 118 zebrafish, D. rerio, a popular fish of aquariums and laboratories. Of these specimens, 30 adult male and 30 adult female were obtained from the same stock and digitized using 15 landmarks. Remaining 58 specimens were 30 day-old specimens and tested for the recognition of the gender development within juveniles. PCA and CVA results showed that the sexual dimorphism in zebrafish was obvious and 81.95% of shape differences within-groups was able to be explained by the first eigen value (PC1). More than 99% of the shape differences between the genders of zebrafish was revealed by the first 3 eigen value. Testing the gender determination was showed that sexual dimorphism is observed in early stage of the life span of zebrafish. According to the results, 35 (60.04%) of the juveniles were assigned to male group while 23 (39.96%) of them was included in the female group. Although it is very difficult to identify sexual shape differences in fish, it can be easily depicted by recent computational methods e.i., Geometric Morphometrics. Furthermore, the application of the method to juveniles facilitates better management of the stocks at early stages.

Keywords - Zebrafish, Danio rerio, Sexual dimorphism, Geometric Morphometrics, CVA, PCA

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Enhancing PV-Powered EV Charging Stations: MPPT Optimization Analysis

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Abstract – The need for sustainable transportation is being driven by concerns about climate change, which has led to the emergence of electric cars (EVs). The conventional grid's infrastructure is strained by this influx, though. Our novel proposal to tackle this issue is the installation of a solar-powered electric vehicle charging station that integrates battery storage. This design addresses the need for sustainable energy while reducing grid stress, providing a workable solution to the problems brought on by the growing popularity of electric vehicles.

Our study conducts a rigorous optimization trip by investigating different Maximum Power Point Tracking (MPPT) methodologies, modeling PV charging infrastructure in detail using MATLAB Simulink. These include Incremental Conductance (INC), Variable Step Size P&O, Variable Step Size INC, and Perturb and Observe (P&O).

Our research evaluates the efficiency of each MPPT technique in terms of power production and system efficiency through a thorough comparison analysis. By carefully analyzing output power simulations, minute differences in each MPPT technique's effectiveness and performance are revealed.

This project's main goal is to provide useful information about the best MPPT method for PV-powered charging stations. The thorough examination of variables including stability, precision, and adaptability to various climatic circumstances yields practical recommendations for stakeholders, engineers, and designers who are dedicated to the sustainable development of transportation infrastructure.

Keywords – Charging Infrastructure Optimization, P&O, INC, MPPT, Energy Management Systems, Renewable Energy Integration

Mechanical and optical micrographic analysis of rubberized concrete for pavement infrastructure reinforcement

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Abstract – In this research the mechanical performance of developed composites, namely the crumb rubber concrete (CRC) and ground tire rubber concrete (GTRC) was assessed to verify their suitability regarding the strengths specified by various technical guidelines used in rigid pavement structural design. Despite feasibility tests reported in the literature, the incorporation of rubber adversely affects the mechanical characteristics of the resulting composites. The focus lies in evaluating compressive and tensile strengths, as well as flexural and splitting strength of rubberized concrete. Traditionally, compressive strength serves as the reference characteristic for cementitious materials. However, in the case of rigid pavements, they function as multilayer structures primarily subjected to tensile forces due to repeated heavy loads. Consequently, concrete experiences premature cracking due to its limited deformation capacity. Visual and optical micrograph analysis of various composites under compression and tension reveals their structural integrity and remarkable ability to restrict crack propagation within the cementitious matrix. The interlocking of crack lips, typically oriented parallel to applied loads, and the behavior of rubberized composites after fracture prompt reflection on the dissipative and energy-absorbing effects of elastomers. Notably, fine ground tire rubber used in GTRC exhibits a favorable tendency to withstand transferred stresses. This research provides valuable insights into the mechanical behavior of rubberized concrete, emphasizing its potential for durable and resilient applications.

Keywords – Rubberied Concrete; Mechanical Performance; Optical Micrograph Analysis ;Crack Propagation; Energy Absorption

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Carob Oil Extraction Optimization

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*Abstract –*The biomass selected in this work is a by-product of carob, belonging to the first generation, and which is represented by carob seeds, collected in Algeria's field. Our work consists of the valorization of the by-products of the tree, the carob tree, which is very available in the countries of the Mediterranean, and which remains very little exploited in our country despite its importance and its nutritional value and its different uses of the everyday life whether in the food, medicinal or other fields. We opted for an optimization on minitab software, of the oil extraction process based on the Soxhlet method using an organic solvent, hexane. Three parameters were treated during all experiments, the mass and diameter of the biomass as well as the volume of the solvent. The results obtained were expressed in graphic form. Experiments have confirmed that the first diameter , the lowest one(250µm), is the best diameter, it is this which gives better oil yield. And regarding the mass of the biomass, the higher it is, the more the mass of oil increases. The application of complete factorial designs with three factors and two levels made it possible to model the experiments carried out that we used, allowed us to obtain the linear mathematical model which represents this extraction. We thus see that the overall effect of mass on yield is slightly greater than that of biomass diameter. An overall effects of mass and diameter have a double compared to the volume of the solvent.

Keywords – Carob; Seed; Extraction; Optimization; Oil; Minitab Sofware

Kablosuz LoRa Sensör Ağları ile KBRN Tehditlerinin Uzaktan Algılanması ve İzlenmesi: LoRaWAN Teknolojisinin Etkin Kullanımı

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Özet – Kimyasal, biyolojik, radyolojik ve nükleer (KBRN) tehditlerin erken tespiti, günümüz dünyasında artan bir öneme sahiptir. Özellikle kritik ve geniş bölgelerde, bu tür tehditlerin uzaktan ve güvenilir bir şekilde izlenmesi büyük bir gereksinimdir. Bu çalışma, KBRN tehditlerini algılamak ve izlemek için kullanılan kablosuz sensör ağları üzerine odaklanmıştır. Çalışmada, düşük güç tüketimi ve geniş kapsama alanına sahip LoRaWAN teknolojisi temel alınarak, enerji verimliliği ve maliyet etkinliği ön planda tutulmuştur. Bu teknoloji, geniş kırsal ve kentsel bölgelerdeki KBRN tehditlerini güvenli bir mesafeden izleme kapasitesini artırmaktadır. Sensör ağları, çeşitli parametreler için tasarlanmış polimer bazlı sensörler (VOC-eCO2, CO, NO2, C2H5CH, PM2.5-PM10, O2 vb.) kullanarak veri toplamakta ve bu verileri bir izleme merkezinden analiz etmektedir. Merkezden sensör verileri takip edilerek kablosuz sensör ağlarının kurulu olduğu bölgeden gelen verilerde değişiklikler tespit edilerek uyarı vermesi sağlanacaktır. Elde edilen sonuçlar, tasarlanan sistemlerin yapılan testler sonucunda izleme menzilinin yeterli olduğu ve KBRN tehditleri karşısında etkin bir şekilde çalıştığını ayrıca erken müdahale imkânı sunduğunu göstermektedir.

Anahtar Kelimeler –KBRN Tehditleri, Kablosuz Sensör Ağları, LoRaWAN, Çevresel İzleme, Polimer Sensörler

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Artificial Intelligence in Managing Depression and Anxiety: A Comprehensive Meta-Synthesis

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Abstract – This study examines the utilization of Artificial Intelligence [AI] in managing depression and anxiety, focusing on students undergoing significant life transitions such as entering high school or college. These transitions often exacerbate feelings of depression and anxiety due to new academic and social pressures, financial stress, and limited access to traditional mental health services. Given these challenges, AI therapy tools emerge as promising resources, providing timely, cost-effective, and easily accessible support. Employing a meta-synthesis approach, this research critically integrates findings from diverse studies to provide a comprehensive overview of the current landscape of AI applications in mental health treatment. It assesses the potential benefits and inherent challenges of AI tools, highlighting their role not only as direct therapeutic aids but also as supplements to conventional treatments. This study aims to guide students, healthcare providers, and researchers in understanding the effectiveness of AI in alleviating mental health symptoms and in navigating its integration into broader therapeutic practices. By synthesizing a range of research outputs, this paper contributes to the ongoing discussion about AI's capabilities and limitations in mental health care, urging further empirical studies to validate AI's clinical efficacy and explore its long-term impacts on mental health outcomes. This comprehensive review thus serves as a critical resource for advancing the application of AI in addressing mental health needs during pivotal transitional periods in young adults' lives.

Keywords – Artificial Intelligence, Mental Health, Depression and Anxiety, Student Transitions, Digital Therapy Tools

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Effect of Fineness and Dosage of Granulated Blast Furnace Slag on the Stability of Self-Compacting Concrete

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Abstract – Granulated blast furnace slag (GGBFS), a byproduct from the metal industry, can be utilized as a construction material. Its slow reaction with water reduces the risk of alkali-silica reactivity and heat generation, benefiting concrete's microstructure. However, due to labor costs, environmental impact, scarcity of natural aggregates, and high slag cost, the full potential of GGBFS remains untapped. This study aims to assess how the fineness and dosage of GGBFS affect the stability of self-compacting concrete (SCC) mixes and identify effective substitutes to optimize compatibility and achieve higher strengths. GGBFS is an off-white cementitious material with pozzolanic properties and increased durability. The control mix was designed without admixtures, while SP was added to other mixes to obtain the same fluidity. Varying GGBFS amounts, with lower powder content than control, replaced some cement. The study found SCC stability decreases as the GGBFS dose increases. However, finer GGBFS particles result in greater SCC stability by better filling voids between cement and admixtures, providing a physical barrier against harmful substances. This reduces the spreading force and water demand, improving cohesion and preventing honeycombing. SCC stability is crucial for ensuring durable, quality building materials. The study demonstrates using finer GGBFS can enhance SCC stability, providing higher slump flow and shorter t_{500} time compared to regular concrete and the same mix with coarser GGBFS. is required.

Keywords – Self-Compacting Concrete, Granulated Blast Furnace Slag, Fineness, Dosage, Stability.

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Harmonic Compensation Using Fuzzy Logic Controlled Active Filters

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Abstract – Semiconductor-based electrical devices are now indispensable in various fields. These devices are distinguished by their nonlinear nature, leading to the generation of harmonics when connected to the electrical grid. These harmonics pollute the grid and undoubtedly degrade the quality of energy. Consequently, the reliability of active filtering is the most monitored and demanded performance by electricity distributors and consumers to address the harmonic issue while adhering to international standards. However, the aim of this paper is to enhance the performance of active filters by proposing the use of fuzzy logic for filter control.

Keywords – Active Filter, Harmonics, Fuzzy Logic Control, THD,

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EŞYA HUKUKU BAKIMINDAN TARIM ARAZİLERİNİN SATIŞI İÇİN BÖLÜNEMEYECEĞİ DÜZEYLER

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Özet – Eşya hukuku fiziki varlığı olan ve hukuken üzerinde hakimiyet kurulabilen varlıkları konu alan hukuk disiplinidir. Bu alanda temel olarak taşınırlar ve taşınmazlar olarak sınıflandırma yapılır. Konumuz bakımından ele alacak olursak taşınmazlar özüne zarar gelmeksizin bir yerden bir yere nakledilemeyen varlıkları ifade etmektedir.

Taşınmaz kavramı konut, işyeri gibi bağımsız bölümleri ve arsa ile arazileri kapsamaktadır. Günlük hayatta arsa ve arazi gibi kavramlar birbiri yerine kullanılabilmektedir. Oysa arsa imarı olan yani konut veya işyeri yapımı için resmi izin verilen yerlerdir. Arazi ise toprak koruma ve arazi kullanımı kanununa göre tarımsal ürün alınabilen toprak parçalarıdır.

Tarım arazilerinin değişik tipleri vardır. Bu tiplerin önemi toplumun gerek hayvancılık gerekse de tarım yoluyla gıda temin etmesinin temeli olmasından kaynaklanmaktadır. Mutlak tarım arazisi, özel ürün arazisi, dikili tarım arazisi ve marjinal tarım arazisi özelliklerine göre birer arazidir.

Bunlar sırasıyla yöre ortalamasında ürün alnabilmesi için sınırlayıcı olmayan arazi; özel bitkisel ürünlerin yetiştiriciliği ile su ürünleri yetiştiriciliğinin ve avcılığının yapılabildiği arazi, mutlak ve özel ürün arazileri dışında kalan ağaç yapılarının olduğu arazi ve mutlak tarım arazileri, özel ürün arazileri ve dikili tarım arazileri dışında kalan, toprak ve topografik sınırlamalar nedeniyle üzerinde sadece geleneksel toprak işlemeli tarımın yapıldığı arazilerdir.

Kanuna göre asgari tarımsal arazi büyüklüğü; mutlak tarım arazileri, marjinal tarım arazileri ve özel ürün arazilerinde 2 hektar, dikili tarım arazilerinde 0,5 hektar, örtü altı tarımı yapılan arazilerde 0,3 hektardan küçük belirlenemez. Bunun sebebi tarım arazileri bölündükçe ürün rekoltesinin azalmasının önüne geçmek içindir. Yani tarım arazilerinin çok küçük parçalara bölünüp ekim yapılması konusunda ortak bir irade çıkmasının zorluğu bertaraf edilmek istenmektedir.

Anahtar Kelimeler – Eşya, Taşınmaz, Arsa, Dikili Tarım Arazisi, Üstü Örtülü Tarım Arazisi

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A Scale Development Study towards Motivation of University Students Learning Science

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Abstract – Motivation has an important role within the affective components. For students' conceptual change processes, motivation exhibits an effective mechanism. In this study, it is aimed to develop a valid and reliable, likert type measuring instrument for the determination university students' motivation to learn science. Before developing the scale, the current scales had been carefully analyzed, the views of experts were taken, and the first draft of scale was prepared. Content and language validity of the scale are provided on expert opinion. The validity and reliability studies of the scale were carried out by applying on 537 university students. Data for the construct validity was subjected to exploratory and confirmatory factor analysis. Results of exploratory factor analyses demonstrated that this scale yielded 3 factors. For three factors, total variance explained reaches 55%. The results of Confirmatory factor analysis verify the three-factored structure (χ^2=165,99; df=83, p=0.00; χ^2/df=1,99; RMSEA=0,067; CFI=,95; GFI=,91). As a result of reliability analysis of the scale, the scale is composed of 15 items and internal consistency Cronbach-Alpha coefficient is calculated as 0,869 for the whole of the scale. Considering the results obtained from the validity and reliability studies, it can be asserted that motivation to learn science scale can be used to determine university students' motivation towards learn science.

Keywords – Developing scale, Motivation, Science, Exploratory factor analysis, Confirmatory factor analysis, Reliability, Validity

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Adjustable Phase Shifter Design for Butler Matrix Feeding Network in 2.45 GHz Wireless Communication Applications

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Abstract **–** This study focuses on developing an adjustable voltage-controlled phase shifter design, specifically for integration with the Butler Matrix, which is used as a feed network for phased array antennas. The key element of the phase shifter design is varactor diodes. These diodes' capacitance can be varied by adjusting the DC voltage, allowing for up to a 100-degree phase shift. The design utilizes left-hand and right-hand transmission line methods for effective phase control. The varactor diodes in the design operate within a voltage range of 5 V to 15 V and offer ten distinct capacitance settings. Mitigating is the impact of the DC voltage on the RF signals at both the input and output, the design includes two interdigital capacitors. Additionally, two spiral inductors are incorporated to isolate the RF signals from the DC supply. The phase shifter is designed on an FR-4 substrate and is tuned to function at a frequency of 2.45 GHz, making it suitable primarily for Butler Matrix network applications in phased array antenna systems. The overall size of proposed phase shifter is 53.23 x 30 mm^2. The reflection coefficient and insertion loss are within acceptable limits for its intended use in a 2.45 GHz Butler matrix feeding network application.

Keywords – Butler Matrix, Phase Shifter, CRLH, Varactor Diodes, Phased Array Antenna

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SCADA integration in smart grid

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Abstract – Supervisory Control and Data Acquisition (SCADA) systems for smart power grids encounter significant challenges during integration and automation, especially when accommodating renewable energy sources. These systems empower electricity consumers by giving them the tools to actively manage energy consumption and minimize costs. Furthermore, SCADA enhances grid resilience by facilitating self-healing mechanisms that promptly address power quality issues and system faults. This paper offers a comparative analysis between conventional power grids and smart grid paradigms, providing insights into the integration of SCADA in renewable energy systems. It explores how SCADA streamlines operations, enhances reliability, and boosts efficiency, particularly in photovoltaic (PV) solar plants. Additionally, the paper delves into the benefits and obstacles of deploying SCADA in renewable energy, including cybersecurity concerns, system scalability, and interoperability with legacy systems.

Keywords – SCADA, Smart Grids, Renewable Energy, Integration, Cybersecurity

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Truncated patch with circular ring metamaterial for enhanced MIMO performance

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Abstract – In this paper, a new wideband metamaterial truncated structure unit cell is introduced, comprising a novel unit cell design aimed at enhancing 5G applications. The unit cell features a truncated structure with a decagon ring slotted in a patch with three slits and is designed on a low-cost FR-4 lossy substrate. With dimensions of 13.8×13.8 mm² and a thickness of 1.6 mm (εr = 4.4, tanδ = 0.02), the proposed metamaterial unit cell covers a wideband frequency range from 7.5 GHz to 9.2 GHz. Notably, it spans segments of the S-band and extends into the C-band within the microwave regime. Simulation results highlight the unit cell's intriguing performance features, particularly its wideband capabilities. These characteristics position the proposed metamaterial unit cell as a promising solution for enhancing Multiple Input Multiple Output (MIMO) performance in 5G communication systems. Through comprehensive analysis, this study underscores the potential of the proposed metamaterial design to address the evolving demands of high-speed data transmission and reliable connectivity in modern wireless communication networks.

Keywords – Circular ring, 5G, Metamaterial, MIMO, Truncated patch and Wideband

Developing an programmable Bot for Trading on the Binance Platform in Bitcoin

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Abstract – Bitcoin embodies a paradigm shift in monetary systems, existing beyond the confines of traditional banking institutions or centralized control mechanisms. This decentralized digital currency traverses the intricate web of the peer-to-peer Bitcoin network, evading the necessity of intermediaries in its transmission from one user to another. Its validation hinges upon the cryptographic scrutiny of network nodes, culminating in the inscription of transactions within the labyrinthine expanse of a distributed public ledger, famously known as the blockchain. This transformative innovation disrupts conventional financial frameworks and heralds a new era of trustless transactions and decentralized governance paradigms.

Keywords – Trading Bots, Risk Management, Trading Strategies, RSI, ETF, Bitcoin Market .

Household income and financial decision-making analysis in regions of Slovakia

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Abstract – The presented paper deals with the financial decision-making of households in the regions of Slovak Republic. Households in the Slovakia are generally perceived as conservative in terms of investment behavior and are characterized by increased risk aversion from the perspective of both EU and OECD member countries, holding a significant amount of their financial resources in the form of deposits in bank accounts. The main objective of the paper is to estimate the differences between regions in the share of household participation in financial markets. Our hypothesis is that households with higher incomes are less risk averse and invest more funds in stocks that exhibit a higher degree of risk. Through statistical methods and data obtained from the Statistical Office of the Slovakia and the Household Finance and Consumption Survey (HFCS) from 2014, 2017 and 2021 conducted by the ECB with the assistance of the National Bank of Slovakia, we demonstrate, that the Bratislava region has the highest share of households investing in shares, which is due to the economic maturity of the region and higher incomes of the population, as there is a positive correlation and linear relationship between household income (expressed through regional GDP per capita, gross income of households, and disposable income of households) and the share of households investing in shares. The demonstrated results are therefore beneficial for economic policy makers and justify the need to mitigate regional disparities between regions to increase households' participation in the financial market and consequently increase economic growth in the future.

Keywords – Financial Decision-Making Process of Households, Investments, Regions, Risk Aversion, Shares

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Mokap Otomobil İskeletinin 3D Yazıcıya Ve Uygun Uzun Karbon Fiber Lifli Polimer (CFRP) Teknolojisine Uygun Kafes Yapıda Tasarımı Ve Analizi

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Özet –Bu çalışmada, Sapmaz [1] tarafından önceden hazırlanmış bir mokap aracın iskelet tasarımı, analizi ve üretimi için Uzun Karbon Fiber Lifli Polimer Enjeksiyonu teknolojisi (CFIP) kullanılarak gerçekleştirilmiştir. İskeletin üç boyutlu tasarımı Solidworks programı ile yapılıp, yapısal ve titreşim analizi Ansys(R23) programında yapılmıştır. Tasarlanan iskelet, ölçüleri Sapmaz [1] tarafından tez çalışmasından referans alınmıştır. İskelet tasarımı literature araştırmasında elde edilen yapısal çelik ile doğrulanmıştır. Geleneksel olarak, günümüzde otomobil iskeletleri genellikle kalıp ve çelik malzemeler kullanılarak üretilmektedir. Ancak, CFIP yöntemi daha dayanıklı, maliyeti daha düşük ve hafif bir üretim yöntemidir. Tasarlanan ve analizi yapılan iskelet, CFIP üretim prosesine uygun olarak tasarlanmış ve 3D yazıcıda üretilecek şekilde ortası boş kanallı yapıda üretim planlanmıştır. Yapısal çelik ile doğrulaması yapılan yenilikçi iskelet tasarımı, CFRP malzemesi ile yapısal ve modal analiz edilerek sonuçları değerlendirilmiştir.

Anahtar Kelimeler – CFIP, CFRP, İskelet Tasarımı ve Analizi, 3D Yazıcı ile Üretim

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Exploring the Intersection of Ecological Language Awareness and Sustainability: Implications for Environmental Discourse

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Abstract – In our urgent pursuit of environmental sustainability, understanding the intricate interplay between language and ecological awareness is paramount. This paper explores how linguistic frameworks shape perceptions and behaviors towards ecological issues. Synthesizing theoretical frameworks from ecological psychology, linguistics, and environmental sociology with empirical research and case studies, the author attempts to explain the profound impact of language on environmental discourse and its implications for sustainability. Ecological language awareness is introduced as key, extending beyond word choice to encompass underlying meanings, metaphors, and narratives that shape our connection with the natural world. Despite challenges like language barriers and cultural hegemony, opportunities exist for fostering inclusive language practices and supporting language revitalization efforts. In conclusion, the author advocates for a nuanced approach to language in sustainability to inspire collective action towards a more sustainable future.

Keywords –Ecological Language Awareness, Sustainability, Environmental Discourse, Linguistic Diversity, Traditional Ecological Knowledge

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Integrating Physics-Informed Neural Networks for the Behaviour of the Solution of the Caputo-type fractional FitzHugh–Nagumo (FHN) neuronal model

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Abstract – In this study, we present a cutting-edge framework using Physics-Informed Neural Networks (PINNs) to numerically analyse the behavior of Caputo-type fractional FitzHugh–Nagumo (FHN) neuronal model. Our method is designed to perform stability analysis and phase-plane analysis along with examining the bifurcation analysis while the system's parameters, such as fractional-order parameter and external electrical stimuli, are varied. We also highlight the framework's ability to effectively capture varying neuronal responses under varying conditions, demonstrating the framework's robustness and adaptability in modelling dynamical behaviour in the fractional FHN. In summary, in this work, we offer the use of PINN in the field of computational neuroscience as a powerful tool for analysing the behaviour of complex dynamical systems, enhancing our capacity for an accurate representation of complex neuronal behaviors.

Keywords – PINN, Fractional, Deep-Learning, Fitzhugh-Nagumo, Caputo, Fractional

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KOLAJENCE ZENGİN BESİNLER VE HİDROLİJE KOLAJEN İÇEREN ATIŞTIRMALIKLAR

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Özet – Amino asitlerin üçlü bir sarmal yapı oluşturarak ortaya çıkardığı bir protein molekülü olan kolajen vücudumuzda kemiklerde, ciltte, bağ dokularında ve kaslarda bulunur. Yapısındaki en küçük amino asit olan glisininin sıkı bir dizilim oluşturması sayesinde strese dayanıklı bir yapıya sahiptir. Bu stresli yapı ise esnemeye karşı direnç oluşturması yönüyle özellikle bağ dokularında önemli bir rol oynayarak, vücuttaki tüm organların bir arada tutulmasında görev sahibidir. Yüksek su tutma özelliği sayesinde ise cildin nemini koruyarak potansiyel olumsuz dış etkenlere karşı koruma gerçekleştirmektedir. 20'den fazla kolajen türü bulunmakla beraber, insan vücudunda bulunan kolajenin %90'ı TİP 1 ve TİP 2'dir. İlerleyen yaşlarda dengesiz beslenme, stres, zararlı UV ışınları gibi nedenlerle vücutta bulunan kolajen yapısında bozulmalar gerçekleşir. Bunun sonucu olarak da çeşitli eklem ve cilt rahatsızlıkları, ileri boyutlarda ise romatoid artrit, sistematik skleroz gibi ciddi rahatsızlıklar ortaya çıkmaktadır. Tüm bu rahatsızlıkları tedavi etmek ya da önlemek amacıyla uygulanacak yöntemlerle vücuttaki sağlıklı kolajen sentezini korumak gerekmektedir. Korumayı sağlamak için iki farklı yöntem kullanılmaktadır. Birinci yöntem, kolajen sentezini destekleyen doğal kaynakların doğrudan tüketilmesini içerir, örneğin ilikli kemik suyu, çilek, kivi, yeşil sebzeler ve kırmızı meyveler gibi. Ancak, bu yöntem bazen vücudun ihtiyaç duyduğu kolajen sentezini tam olarak karşılayamayabilir. Bunun nedeni, doğal protein kaynaklarının moleküler ağırlığının yüksek olmasıdır. Örneğin, ilik suyundaki kolajen proteini 300.000 daltondan fazla ağırlığa sahiptir, bu da vücut tarafından emilimini zorlaştırır. Bu nedenle, ikinci bir yöntem olarak, hidrolize kolajen kaynaklı takviye besinler değerlendirilmektedir. Deniz yosunu, balık, domuz ve tavuk gibi farklı kaynaklardan elde edilen ve çeşitli ekstraksiyon yöntemleriyle üretilen bu takviye gıdalar, kolajen pazarında artan talep ile giderek çeşitlenmektedir. Bu çeşitlilikte, özellikle atıştırmalık tarzı ürünlere olan ilginin artması, pazardaki büyümeyi büyük ölçüde etkilemektedir. Bu çalışma, elektronik süreli yayınlardan derlenerek oluşturulmuş, doğal kolajen besinleri ve hidrolize kolajen içeren atıştırmalıklara odaklanılmıştır.

Anahtar Kelimeler: Kolajen, Gıda Takviyeleri, Hidrolije Kolajen, Sağlıklı Atıştırmalıklar, Ekstraksiyon Yöntemleri

Classification of Leaf Images with CNN and RF

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Abstract – Agricultural production in a country highly decreases by infecting pests to the agricultural plants. Today, in general, an agricultural engineer or a farmer tries to detect plant diseases by checking the plant leaves, but this process is very hard and time-consuming because of harsh environmental conditions. Instead of this, leaf images of plants can be controlled by drones automatically, and diseased plants can be detected. In this work, leaf images have been categorized as diseased and healthy leaves using Convolutional Neural Networks and Random Forests. The leaf data set which consists of healthy and diseased RGB leaf images has been divided into a train data set and a test data set. The systems with Convolutional Neural Networks and Random Forest classifiers have been trained in the train set. Convolutional Neural Networks include feature maps and classification operations, but in feature maps, convolution, batch normalization, ReLU, and max pooling operations are performed. For the Random Forest classifier, the training features are obtained and trained from the feature map of the Convolutional Neural Network. After the training stage, the trained models detect the diseased and healthy leaf images in the leaf image test set. For the evaluation of the systems, the accuracy and F1-score metric values of the models have been computed, and they have been compared with each other.

Keywords – Leaf Categorization, Deep Learning, Machine Learning, CNN, RF, Artificial Neural Networks

Effect of Work Place Bullying on Job Performance And Health Among Nurses

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Abstract – At the beginning of the 21st Century, workplace bullying became a hot topic of discussion. There have been a limited number of research studies on bullying to which nurses are exposed. Bullying at work has a negative impact on a person's ability to do their job. The purpose of the current study is to determine the rate and nature of workplace bullying experienced by nurses who work in tertiary care in Pakistan and the effects on nurses' practice and depression status. A five section survey form was used for the collection of research data. The first section consisted of the participants' demographic information, such as gender, age, education, position and experience. The other variables were collected in four groups: workplace bullying behavior, workload, organizational effects and depression. The cross sectional study design was conducted in a tertiary care hospital for the period of six months. The sample Size was 110 Nurses of tertiary care hospital and the sampling technique was Convenient Random Sampling and the measurement tool was a questionnaire including five sections. The first section included the participants' demographic information; the other variables were measured in four categories: Workplace bullying behavior, workload, working hour, organizational effects, and depression. Data collection method was distribution of questionnaire. Workplace bullying leads to depression, lowered work motivation, decreased ability to concentrate, poor productivity, lack of commitment to work, and poor relationships with patients, managers and colleagues. Bullying experienced by nurses negatively affects nurses' job performance and can lead to depression. It is hoped that practitioners in the field will take these findings into account in order to modify the working conditions of clinical nurses and decrease bullying behaviors in the hospitals.

Keywords – Bullying, Work Place, Job Performance, Health and Nurses

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ESTIMATION OF GREEN HOUSE GAS (GHG) EMISSIONS IN NUST H-12 ISLAMABAD

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Abstract- Green House Gas (GHG) emissions are the major contributors to extreme climate such as global warming and severe heat waves as well. To provide the remedial measures for these hazardous emissions the first step is to track the sources of these emissions and to find out the cost analysis confined to those sources. As the study explains within the restrictions of lack of access to all the sources, the time factor as well as the due to security reasons whole amount of data could not be gathered. The study encompasses the observance of monthly GHG emissions through the National University of Sciences and Technology (NUST) transport facility including the students, faculty, and staff transport along with the transport required for industrial visits. As a result, a massive influx of GHG emissions was found because of the daily and occasionally transport services. The most appropriate alternative to cut off the emissions is to increase electric vehicles as well as switch towards conscious practices to significantly reduce the emissions. There are many universities in the capital of Pakistan if this approach could be implemented in maximizing numbers a phenomenal cost and health-efficient environment can be promoted.

Keywords- Carbon Dioxide, Environmental Degradation, Greenhouse Gases, Hazards, Transportation.

Image Processing in Architectural Acoustics: A New Frontier

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Abstract – The rapidly evolving field of image processing has found novel applications in architectural acoustics, offering transformative solutions to age-old challenges. This article delves into the intersection of these two domains, elucidating how cutting-edge image processing techniques can decipher, analyze, and address intricate acoustic concerns in diverse architectural settings. From sound propagation and reflection to diffraction and absorption, the integration of image-based methods, including beamforming, wavefront analysis, and sound source localization, presents a revolutionary approach. The investigation highlights the benefits of image processing regarding precision, efficiency, and its non-intrusive nature, while also pointing out probable constraints like the necessity for advanced equipment and reliable algorithms. As the acoustic landscape of architectural designs becomes increasingly complex, image processing emerges as a beacon, illuminating new pathways towards acoustically enriched and harmonious spaces. The article culminates in a call for further research, emphasizing the vast and untapped potential of integrating image processing in the realm of architectural acoustics.

Keywords – Image Processing, Acoustic Optimization, Sound Absorption, Architectural Acoustics, Sound Reflections.

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Pathogenicity of Entomopathogenic Fungus And Bacterium Against *Oryzaephilus surinamensis* L. (Coleoptera: Silvanidae) in Stored Dates

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Abstract – Saw toothed beetle, Oryzaephilus surinamensis (Coleoptera: Silvanidae) is regarded as the most devastating insect pest in stored dates. Adults and larvae feed on dates by making tunnels between the external fruit skin and flesh. Theentomopathogenic fungus and bacterium, Metarhizium anisopliae and Xenorhabdus nematophila was used as bio-control agents against this serious pest (O. surinamensis). Five concentrations of entomopathogenic fungus and bacterium (1×10^4, 1×10^5, 1×10^6, 1×10^7 and 1×10^8) were prepared; each replicated thrice for bioassays to determine their aptness against O. surinamensis. Haemocytometer was used for counting spores and spectrophotometer used for counting bacterial cells and colonies. To conduct insect bioassays, infested date fruits will be collected from different localities; O. surinamensis culture will be maintained in an incubator at 30-32°C temperature and 70-75% relative humidity in the 'Stored Product Entomology Laboratory'. Mortality of O. surinamensis was directly proportional to the concentration of M. anisopliae and X. nematophila. Highest mortality was recorded at concentration of 1×10^8 spores/ml all beetles were died after 6 days, on the other hand the highest mortality was observed at the concentration 1×10^8 cells/ ml all beetles were died after 5 days and vice versa. X. nematophila showed better results as compared to M. anisopliae. This effective control strategy has significant contribution towards development of commercial microbial formulations of M. anisopliae and X. nematophila and is recommended to be a part of integrated pest management of Saw toothed beetle.

Keywords – Oryzaephilus Surinamensis, Metarhizum Anisopliae, Xenorhabdus Nematophila, Mortality and Concentrations

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Management of Angoumois Grain Moth, *Sıtotroga cerealella* Usıng Indıgınous Plant Extracts

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Abstract – Angoumois grain moth (*Sitotroga cerealella*) is a destructive pest of wheat in storage. It causes severe damage in wheat and other stored grains also. The world is looking forward towards the eco-friendly use of botanicals as insecticides including Neem (*A. indica*), Phulai (*A. modesta*), Piazi (*A. tenuifolius*), Pholi (*C. oxyacantha*), Bhangra (*E. prostrata*), Khatiboti (*O. corniculata*), Asgand (*W. somnifera*), Kandiyari (*S. marianum*), Bhakra (*T. terrestris*) and Sukh chain (*D. indica*), leaf extract of different indigenous plants were used against *S. Cerealella* in wheat grains. Results showed that the least insect count was recorded at 30% concentration of *A.indica* after 60 days as compared with control where maximum numbers of insects were counted 22.93. Similarly the results of *E. prostrata,S. marianum, T. terrestris* also showed significant results and inhibited the insect growth. The results depicted that 20% concentration of *S. marianum* showed statistically pairing repellent effect as showed by 30% concentration of *C. oxyacantha*. While *W. somnifera* plant extract at 10% concentration gave similar observations as observed by the application of *A. modesta* 20% concentrations. The outcome of this research will lead to an effective and environmental friendly control measures against *S. cerealella* and lead to development of different formulations of bio pesticides of these indigenous plant materials.

Keywords – Angoumois Grain Moth, Management, Plant Extracts, Concentrations and Repellency

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Study of the Effect of Partial Shading on Photovoltaic Conversion Systems

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Abstract – Currently, the expansion of using solar photovoltaic technology is constrained by its relatively higher levelized cost of photovoltaic panel unities compared to its efficiency under specific climatic conditions. Therefore, it is imperative to enhance and optimize every aspect of the newly developed photovoltaic power plants to get better electric productivity. Until nowadays, the existing studies have not sufficiently investigated this complex and crucial issue. Because of partial occlusion, the output power and voltage curves of the connected photovoltaic panels exhibit multiple peak points, thus complicating the design of an appropriate maximum power tracking system. Accordingly, the challenge lies in identifying the most suitable maximum power point tracking algorithm for each shading scenario in an array of interconnected solar panels. The presented research findings suggest that not all algorithms are suitable for connected photovoltaic panel exposures under extremely unfavorable shaded conditions. Additionally, it indicates that each connection mode corresponds to a specific maximum power point tracking algorithm. The paper discusses the outcomes obtained from various configurations of connecting photovoltaic panels. The model of the study was developed using the MatLab/Simulink software.

Keywords –Photovoltaic, Optimization, Renewable Energy, Maximum Power Point Tracking, Shaded Conditions.

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Bir Kamu Binasının Enerji Performansını Artırma Çalışmalarının Takibi ve Değerlendirilmesi

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***Özet** –* Değişen ve gelişen dünya koşullarında enerji korunumu önemli bir kavramdır. Enerji kaynaklarının kıt olması, enerjinin verimli kullanılmasını zorunlu kılmaktadır. Enerji korunumunun sağlanması ancak enerjinin verimli kullanılması ve enerji tüketiminin azaltılması ile mümkündür Enerji ihtiyacı bakımından sanayi sektöründen sonra gelen yapı sektörü birçok alanda enerji tüketmektedir. Yapılar enerjiyi en fazla ısıtma/soğutma sistemlerinde harcamaktadır. Bu sebeple yapılarda minimum enerji tüketimi ile maksimum verimliliği sağlamak hedeflenendir. Bu hedefle yapıların enerji performansı belirlenmekte, enerji performansı düşük olan yapılarda performans artırıcı çalışmalar yapılmaktadır. Bu çalışmalardan bir tanesi de yapıları enerji kaybına karşı daha yalıtkan hale getirmektir. Yapıların yalıtılması işlemi ile ciddi oranlarda enerji tasarrufu sağlanması beklenmektedir. Yapıların enerji performansı yapı projelerindeki verilere göre, TS 825 Binalarda Isı Yalıtımı Kuralları standardında belirtildiği şekilde teorik hesaplamalarla belirlenmektedir. Bu çalışmada enerji performansını artırmak isteyen bir kamu binasına uygulanan yalıtım işlemleri takip edilmiş ve yapının mevcut durumu ile yeni durumu arasındaki fark, enerji performansı bakımından değerlendirilmiştir. Kamu binasının duvarları çift katlı tuğla duvar ile sandviç şekilde inşa edilmiştir. Aslında sandviç duvarı oluşturan tuğlalar arasında yalıtım malzemesi bulunmaktadır. Fakat binanın enerji performansının yeterli olmadığı gerekçesiyle binaya dıştan mantolama uygulaması yapılmıştır. Binanın mevcut hali ve yalıtım uygulanmış yeni haline ait görüntüler alınmış, TS 825 standardı gereği bina duvarlarının ısıl performansı değerlendirilmiştir. Elde edilen verilere göre her iki farklı durumda duvarların ısıl geçirgenlik değeri arasındaki fark yaklaşık %37- %43 olarak belirlenmiştir. Bu verilere göre dıştan yapılan yalıtımın binanın enerji performansını olumlu etkilediği görülmüştür.

Anahtar Kelimeler – Isıl Performans, Isıl Geçirgenlik Değeri, Kamu Binası, Sandviç Duvarlar, Mantolama

FARKLI YÜKSEKLİKLERE SAHİP BETONARME YAPILARIN DEPREM ETKİSİ ALTINDA DAVRANIŞLARININ İNCELENMESİ

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Özet – Depremler, fay hatları üzerine kurulu olan ülkeler için yadsınamaz bir gerçektir. Özellikle Anadolu'nun sismik olarak dünya üzerindeki en aktif bölgelerden biri olması, Doğu, Batı ve Kuzey Anadolu Fay Hatları ile çevrelenmiş olması, ve Kuzey Anadolu Fay Hattı (KAF)'nın dünya üzerinde en hızlı hareket eden ve en aktif sağ-yanal atımlı faylarından biri olması Türkiye'nin de deprem gerçeğini tekrardan gündeme getirmiştir. Bu bağlamda Türkiye'deki yapıların kentsel dönüşüm projeleri ile yenilenme işlemi hız kazanmış olsada ülkenin deprem gerçeği göz önünde bulundurulduğunda yeterli olmadığı da görülmektedir. Bu çalışmada farklı yüksekliklere sahip betonarme yapıların deprem etkisi altında davranışları incelenmiştir. Çalışmanın ana problemini de özellikle kentsel dönüşüm projelerinde H_{max} 'ın farklılık göstermesi oluşturmuştur. Yapılan tasarımlarda 3-6 ve 9 katlı üç farklı yapı modellenmiştir. Modelleme TBDY 2018 madde 5.4. Doğrusal Olmayan Hesap İçin Taşıyıcı Sistemin Modellenmesine İlişkin Kurallar'a göre gerçekleştirilmiştir. Yapıların özellikleri (temel, kolon, kiriş vb.) birbiri ile aynı olacak şekilde tasarlanmıştır. Yapıların yalnızca kat sayıları birbirlerinden farklılık göstermektedir. Çalışmada sonlu elemanlar yöntemi kullanılarak Sap2000 paket programında yapısal analizler gerçekleştirilmiştir. Analizler sonucunda ilgili kurum ve kuruluşlara önerilerde bulunulmuştur.

Anahtar Kelimeler – Sonlu Elemanlar, Kentsel Dönüşüm, Deprem, Sap2000, TBDY2018

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Role of Sentiment in Households' Financial Decision Making during the COVID-19 Pandemic: Survey from Empirical Research

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Abstract – This paper investigates the relationship between household sentiment and financial decision making during the COVID-19 pandemic. Although the COVID-19 pandemic has been overcome globally, the concept is very underdeveloped in the empirical literature. This paper therefore addresses this concern by attempting to highlight areas of contention in research in this sphere of household financial decision making. Based on several empirical studies dating back to the COVID-19 pandemic and organised chronologically, we come to formulate a number of areas that should be targeted to advance further research. These open areas include (a) the definition of sentiment, (b) the way sentiment is measured, (c) the distinction between professional investment decision making and household investment decision making, and (d) the distinction between consumer behaviour and household investment behaviour and (e) the lack of empirical studies addressing the impact of household sentiment on their financial decision making during the COVID-19 pandemic. Continued research in this area of finance is therefore also essential for understanding and learning for future potential pandemics.

Keywords – COVID-19, Financial Decision Making of Households, Household Sentiment, Investment, Investor Sentiment