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Editorial

We are delighted to extend a warm welcome to all participants attending the International Conference 2024 on 7th – 8th November 2024. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in multidisciplinary fields. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for International Conference 2024 contain the most up-to-date, comprehensive, and globally relevant knowledge across various disciplines. All submitted papers underwent rigorous peer-reviewing by 2-4 expert referees, and the papers included in these proceedings were selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results but also serve as a valuable summary and reference for further studies.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also appreciate the efforts of the technical program committee, reviewers, and authors for their dedication.

Since September 2024, the Organizing Committee has received more than 55 manuscript papers, covering various aspects of multidisciplinary research. After review, approximately 26 papers were selected for inclusion in the proceedings of International Conference 2024.

We thank all participants for their significant contribution to the success of the conference. Our gratitude extends to the keynote speakers, individual speakers, technical program committee, reviewers, and the organizing committee for their efforts in making this conference a reality.

Acknowledgement

The International Conference 2024, was successfully held in 7th – 8th November 2024. We extend our heartfelt gratitude to our colleagues, staff, professors, reviewers, and members of the organizing committee for their unwavering support in making this conference a success.

We would also like to thank all the participants who traveled far and wide to attend this conference and those who attended the event virtually, making it a truly global event. This conference provided a platform for students, professionals, researchers, and scientists to share their latest research and developments in various disciplines.

The aim of the conference was to promote research and development activities and to encourage scientific information exchange between researchers, developers, professionals, students, and practitioners from all around the world. Once again, we thank everyone who contributed to making this conference a resounding success.

Nathan Vincent
Program Manager
Institute for Sustainable Innovation & Technology (ISIT)

Contents:

Abstract

Cash Pooling: A Key Lever for Financial Performance

Mina Idhoumad
Sidi Mohamed Ben Abdellah University, Fez: National School of Commerce and Management

Abstract:

In today's dynamic business environment, effective cash management is crucial for optimizing financial performance. This study explores the concept of cash pooling as a strategic financial tool and its impact on enhancing corporate financial performance. Cash pooling, which involves consolidating the cash resources of multiple subsidiaries or accounts into a central account, enables companies to manage their liquidity more efficiently and reduce financing costs. The research delves into various cash pooling structures, including physical and notional pooling, and examines their benefits and challenges. By analyzing case studies of companies that have implemented cash pooling, the study highlights how this practice can lead to significant improvements in liquidity management, reduce interest expenses, and support better investment decisions. The findings suggest that cash pooling is not only a practical tool for improving operational efficiency but also a strategic lever for achieving long-term financial goals. The study provides insights into the conditions under which cash pooling can be most effective and offers recommendations for companies considering its implementation. This research contributes to the understanding of cash pooling as an essential component of modern financial management and its role in driving corporate success.

Witch-Hunting -- A Hindrance to Gender Equality and Social Justice in India

Dr. Sadhana Meghwal
Asst. Professor Dept. of History & Culture SPUP (Sardar Patel University of Police, Security and Criminal Justice), Jodhpur Rajasthan INDIA

Dr. Sher Singh
Asst. Professor Dept. of History Patel Memorial National College Rajpura Panjab INDIA

Dr. Balraj Singh Brar
Asst. Professor Dept. of History and Panjabi Historical Studies Punjabi University, Patiala, Panjab INDIA

Dr. Asha Parmar
Professor Dept. of Political Science & Principal Govt. Girls College Jhalamand, Rajasthan Jodhpur INDIA

Abstract:
Social Justice is a concept that seeks to address the systematic barriers and inequalities that exist in society and advocates for the equitable distribution of resources and also for equal opportunities for development. India has a traditional pattern of Society which is Caste based and Patriarchal. Gender Discrimination and Oppression from "Womb to Tomb" is a widespread phenomenon. Womanhood is revered in Indian Culture as a manifestation of Divine Qualities. They have been called the "Better Half ", but in practice, women are the most deplorable lot. Throughout the centuries, women (mostly of the lower classes and castes), have been in a state of Nutritional stress because they eat less and also because they eat last. The practice of witchcraft, i.e. “Dayan Pratha” has been pervasively customary pan-India but is much more prevalent in the economically poor regions, especially the states having a high concentration of tribal population. Concerned and cognizant of the collective trauma and memory of long-drawn centuries of unspeakable oppression, this research paper on witch-hunting, has focused on the denial of justice to the women of oppressed communities.

Keywords:
Patriarchy, Discrimination, Caste, Gender, Social-Justice.

Deep Learned Image Compression and Semantic Segmentation Networks

Bin-Qian Chang
Institute of Computer and Communication Engineering, Department of Electrical Engineering, National Cheng Kung University, Taiwan

Jar-Ferr Yang
Institute of Computer and Communication Engineering, Department of Electrical Engineering, National Cheng Kung University, Taiwan

Abstract:

Deep learning neural networks have become the mainstream in many computer vision tasks such as image recognition and semantic segmentation. To reduce storage space and transmission bandwidth, the images are often needed to be compressed. However, compressed images might greatly affect the performance of semantic segmentation. To balance both needs, it is necessary to optimize segmentation neural networks for specific compression algorithms with suitable compression rates. Recently, deep learning networks for image compression have been greatly improved and better than traditional coding standards. Therefore, in this paper, we propose a neural network that can be adjusted the compression ratio, allowing end-to-end training of image compression and semantic segmentation modules. The proposed transformer-based compression network uses the prompt tuning method to adjust the compression ratio. For semantic segmentation tasks, which takes compressed image features as the input, the modified Mask2Former architecture can perform the segmentation directly. Experimental results show that the proposed method can reduce the performance loss in semantic segmentation tasks caused by image compression.

Keywords:

Image Compression, Semantic Segmentation, Transformer, Mask2Former.

A Depth Completion Network for Efficient Depth Representation

Lu-Wen Chen
Institute of Computer and Communication Engineering, National Cheng Kung University

Wei-Jong Yang
Department of Artificial Intelligence Applications, National Chin-Yi University of Technology

Abstract:

3D information with depth pixels or Lidar points is the key component for robotic perception, autonomous driving, virtual reality and 3D movies. Traditional 3D data representation requires large amounts of data, making the transmission bandwidth and storage resource inefficiency. In this paper, instead of complete 3D information, we only need a few of 3D depth information and use depth completion techniques to improve data efficiency by predicting the missing depth data by leveraging sparse depth map and RGB image to reconstruct dense depth map. We can reduce the amount of depth data while maintaining quality and accuracy in the receiver by using a depth completion network. The proposed depth completion network combines autoencoder and guided attention mechanisms to enhance depth representation efficiency. The proposed approach reconstructs more accurate depth maps than the other approaches if we use the same number of depth pixels to reduce the data transmission burden while ensuring high-quality depth information. The proposed approach demonstrates the practical and efficient application of depth completion.

Keywords:

Depth Completion, Autoencoder, Guided-Attention, Depth Sparsity.

Scaffolding's Impact on Online Role-Playing Education

Clyde A. Warden
National Chung Hsing University, Taiwan

Judy F. Chen
Overseas Chinese University, Taiwan

Abstract:
Role-playing games (RPGs) are a valuable pedagogy for developing cognitive and metacognitive skills. While much research addresses the cognitive aspects, the link between metacognitive awareness and socially shared regulation of learning is less understood. This study examines how scaffolding impacts learners' ability to regulate collaborative learning in online and classroom settings. Using a quasi-experimental design, university students were assigned to test or control groups, and video prompts were used to enhance metacognitive role awareness. Findings show that video prompts improve metacognitive role differentiation and social regulation in online settings, while classroom environments inhibit these effects due to stronger social norms. This research highlights the importance of context in RPG-based instruction for metacognitive development.

Keywords:
metacognitive roles, prompts, collaborative learning, group dynamics.

Optimising the Design and Simulation of a Globe Valve Using CFD in Perspective of Bangladesh

Sakib Mahmud
Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

Mohammad Musfeq Iqfath
Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

Md Mahadi Hasan
Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

Abstract:

This paper highlights a comprehensive study on the enhancement of globe valve design, widely used in oil and gas facilities for controlling fluid flow. Traditional globe valves are often facing issues such as valve leakage and valve passing, which significantly hamper their performance. To address these challenges, this study introduces an innovative design modification aimed at optimizing fluid flow performance and minimizing the pressure differential across the valve. The main purpose of this research lies in utilizing Computational Fluid Dynamics (CFD) to validate the improvements made over the original design. The results indicate that the modified globe valve exhibits superior performance in various parameters compared to the previous model, with the notable exception of valve passing issues at the contact seal between the seat and the disk in a fully closed position. A significant aspect of this project is that it marks the first-ever design and manufacturing of an industrial-grade globe valve in Bangladesh, setting a good impact on the country's industrial landscape. This breakthrough signifies a substantial advancement in the domestic production capabilities of industrial-grade globe valves in Bangladesh.

Keywords:

Globe Valve, Computation Fluid Dynamics (CFD), Pressure Drop.

Policies on Women's Migration from South Asia: Comparative Perspectives

Sadananda Sahoo
Associate Professor, School of Interdisciplinary and trans-disciplinary Studies, Indira Gandhi National Open University, New Delhi

Abstract:

The main objective of this paper is to examines the existing policies on women from one of the largest migrants sending corridors (South Asia) to one of the largest migration destination corridors of world (GCC countries) and provide a comparative picture. Migration needs to be safe and orderly as envisaged in the Global Compact for Migration (GCM). The recent global migration has seen women from various regions, particularly South Asia, making their presence in every sector, from high-skilled professional to low skill domestic helps. Women from South Asia cross borders to look for better opportunities, to take care of their families' economic security back in their native countries and for their personal growth. Indeed, their movements are not free as it appears. Both men and women have to go through a long and important legal authority process to migrate. These legal processes have to be clear from native and host countries, importantly, when it comes to the issue of women's migration, they face a double legal burden compared to their male counterparts. This legal process takes the form of protective policies enacted by the native government. The policies are enacted to protect women from exploitation. Nonetheless, the central question that arises is whether these policies were to protect migrant women, or whether they are creating barriers and restricting or limiting their free movement. The paper uses push and pull theory of Everett S. Lee (1966) where migration occurs in a host of positive, negative and intervening factors. The study is based on secondary data from national and international organisations. There are no coherent migration data available any South Asian countries. However, this paper analysed available data from the various sources directly and indirect available. The policies of many of these South Asian countries still poses barriers for women to migrate. The impact the overall migration experience owing to cultural -social and economic factors needs more proactive policies.

Keywords:

South Asia, International Migration, Gulf Countries Council, Women Migration, Migration policy

Selective Hemosorption and Extracorporeal Autohemomagnetotherapy in the Complex Treatment of Patients with Severe COVID-19

Rakashevich Dmitry
Yakubtsevich Ruslan, Grodno State Medical University, Belarus

Abstract:
The use of selective hemosorption and extracorporeal autohemomagnetotherapy in the complex intensive care of severe COVID-19 allows reliably reducing the level of fibrinogen and preventing the growth of D-dimers. Selective hemosorption and extracorporeal extracorporeal autohemomagnetotherapy in patients with severe COVID-19 infection complicated by cytokine storm contributes to a reliable increase in the respiratory index, ROX- index, and a decrease in lactate concentration. The use of selective hemosorption and extracorporeal autohemomagnetotherapy in the complex intensive care of severe COVID-19 leads to a reliable decrease in the concentrations of Interleukin-6, Interleukin-8, C-reactive protein, accompanied by an increase in the number of lymphocytes. Complex intensive therapy with the inclusion of selective hemosorption and extracorporeal autohemomagnetotherapy leads to a decrease in the sum of points on the APACHE II, NEWS2, SHOCS–COVID scales, which indicates an improvement in the condition of patients. The inclusion of selective hemosorption and extracorporeal autohemomagnetotherapy in the complex intensive care of severe COVID-19 is accompanied by a statistically significant decrease in the chances of an unfavorable outcome in the form of mortality by 3 and 2 times on the 14th day with tocilizumab and levilimab therapy, respectively, by 2.5 times compared to levilimab therapy on the 28th day.

The Impact of Myanmar's 2021 Coup

Hendra Maujana Saragih
Universitas Nasional, Jakarta, Indonesia

Andi Dwi Cahya Karuniawan
Universitas Nasional, Jakarta, Indonesia

Abstract:

The events of Myanmar's military coup began on February 1, 2021. This was marked by the arrest of President Wint Myint and Aung San Suu Kyi. This arrest condition made Myanmar citizens hold a massive demonstration. This coup incident has put psychological and physical pressure on the people of Myanmar because they are in dire need of humanitarian assistance and international assistance. Myanmar's military regime is taking control of the situation but civilians are harmed by armed resistance. The chaotic conditions caused by the demonstrators have added to economic paralysis, uncontrollable poverty and food insecurity, and even great pressure on the health system in the midst of the Covid-19 wave.

Keywords:

Myanmar coup, Covid-19, Socio-Economic Impact.

Nationalism and Ethnic Conflict: A Consequence of Globalization

Sonny Sudiar
Universitas Mulawarman, Indonesia

Abstract:

Nationalism refers to a political concept of national identity. In the context of globalization, nationalism may be viewed from two perspectives: as a reaction to globalization or as a result of globalization. Meanwhile, ethnic conflict is a type of internal state conflict. There are various elements that contribute to ethnic conflicts. They might be structural, political, social and economic, cultural, or perceptual issues. Both nationalism and ethnic strife have become prominent topics in world affairs. Nationalism resurfaced as a threat to global order, particularly following the conclusion of the Cold War. Many countries have fragmented as a result of ethnic strife, which has been seen as a struggle between different varieties of nationalism. Globalization has also contributed significantly to this condition. This article aimed to show the strong correlation between nationalism and ethnic conflict and assess the implications of globalization for them.

Keywords:

nationalism, ethnic conflict, globalization.

Identifying Opportunities for Latvia’s Export to China

Haidong Feng
University of Latvia, Riga, Latvia

Abstract:
Latvia's economic growth relies heavily on exports. In recent years, Latvia's exports have also encountered severe challenges due to the Russian-Ukrainian war. Therefore, seeking a broader export market is crucial to Latvia's economic development. Based on the methodology of exploring and promoting Latvia’s export to China, the author has explored seven product categories (Cereals, Photographic or cinematographic goods, Tin, Railway, tramway locomotives, rolling stock, equipment, Explosives, pyrotechnics, matches, pyrophorics, Silk, and Arms and ammunition, parts and accessories) can be produced in Latvia with high demand potential and high trade barriers in China’s market by Trading Economics from 2008 to 2023. By the import trend of these seven product categories in China’s import market, the aim of this paper is to analyze the markets of the seven product categories from political and commercial risk, country’s size and growth, short and long term import growth, import market size, degree of concentration, and trade restrictions according to Decision Support Model and Papadopoulos et al.’s trade-off model to identify the opportunities of Latvia's export to China. Finally, the paper concludes with suggestions on how to reduce trade barriers for Latvian exporters of the above product categories to seek export opportunities to China’s market.

Keywords:
export, China’s market, demand potential, trade barriers.

Paraprotein-Induced Discordance Between Direct and Total Bilirubin Levels in Patients with Myeloma: A Case Series

Margarita Kostina
The Loginov MCSC

Abstract:

Introduction: Elevated direct bilirubin levels despite normal or low total bilirubin values pose a diagnostic challenge in patients with myeloma. Paraproteins present in these patients may interfere with direct bilirubin measurement, leading to discrepancies between direct and total bilirubin levels.

Objectives: This case series aims to illustrate the impact of paraproteins on direct bilirubin measurement in patients with myeloma and highlight the variability in paraprotein composition among different cases.

Methods: Four cases of patients diagnosed with myeloma were identified, each presenting with high direct bilirubin levels and normal total bilirubin values. Total and direct bilirubin levels were measured on Beckman Coulter Biochemical Analyzers using Beckman Coulter reagents. Additionally, the medical histories and treatment regimens of these patients were different, highlighting the variability in their conditions and management approaches.

Conclusion: The presence of paraproteins in patients with myeloma can lead to discordant direct and total bilirubin levels, highlighting the need for further research to elucidate the clinical implications of these findings. Understanding the influence of paraproteins on direct bilirubin measurement is crucial for optimizing the management of patients with myeloma. This case series underscores the importance of considering paraprotein interference in interpreting bilirubin levels in patients with myeloma.

Composite Elements of the Emerging and Surging Effects of Computer Technology Implementation in Computer Graphics, Conceptualization, Designs and Development, Virtual Adaptation and Post Production Reality in the Emerging African Market Environment

Onyiriuka Uchechi
Zion college of Divinity

Abstract:

Computer technology has rapidly transformed the way in which visual content is created and presented in the emerging African market environment. The implementation of computer graphics, conceptualization, design, and development has become increasingly prevalent, leading to a surge in virtual adaptation and post-production reality. This abstract will explore the composite elements of this emerging trend and its effects on the African market.

Integration of computer technology has revolutionized the field of computer graphics in Africa. Designers and developers now have access to advanced software and tools that enable them to create stunning visual content with precision and efficiency. This has paved the way for innovative concepts and designs that were previously out of reach for many African creatives. As a result, the African market is witnessing a boom in the production of high-quality graphics that rival those produced in more developed regions.

Conceptualization is another key area where computer technology is making a significant impact in Africa. Designers can now visualize and experiment with ideas in a virtual environment, allowing for greater creativity and experimentation. This has led to the emergence of unique and original concepts that resonate with African audiences and reflect the diversity and richness of the region's cultures. The ability to conceptually develop ideas in a digital space has also streamlined the design process, reducing time and costs associated with traditional methods.

Virtual adaptation is a rapidly growing trend in the African market, driven by the increasing accessibility of virtual reality (VR) and augmented reality (AR) technologies. These immersive experiences are being used to engage audiences in new and innovative ways, allowing brands to create personalized and interactive experiences that resonate with consumers. This shift towards virtual adaptation has opened up new opportunities for businesses in Africa to connect with their target markets and differentiate themselves in a competitive landscape.

Post-production reality is another area where the effects of computer technology implementation are being felt in the African market. The ability to edit and enhance visual content in real-time has transformed the way in which films, advertisements, and other forms of media are produced. Post-production reality tools enable designers to manipulate and enhance visuals with precision, ensuring a seamless and polished final product. This has raised the bar for content creators in Africa, pushing them to deliver high-quality output that meets international standards.

Conclusion, the composite elements of computer technology implementation in computer graphics, conceptualization, design, and development, virtual adaptation, and post-production reality are

reshaping the landscape of the emerging African market environment. This trend is driving innovation and creativity, enabling African creatives to produce cutting-edge visual content that resonates with audiences both locally and globally. As technology continues to evolve, African market will continue to benefit from the transformative effects of computer technology in the realm of visual content creation and presentation.

Enhancing the Binary Non-Dominated Sorting Genetic Algorithm II (BNSGAII)S for Improved Accuracy and Reduction of Feature Selection Subsets

Hojjat Farrahi Farimani*
Department of Computer Engineering, Mashhad Branch, Islamic Azad University, Mashhad, Iran

Abstract:
Feature selection is a crucial process aimed at eliminating irrelevant and redundant features from a dataset to enhance learning performance in terms of accuracy and model building time. Traditional techniques in this domain face challenges such as high computational costs, particularly in the training phase, even with moderately sized datasets. While efforts have been made to develop efficient and accurate feature detection methods, the identification of feature sets that can enhance detection accuracy remains a key priority. Feature selection poses a complex NP-hard problem, making it difficult to guarantee an optimal solution. This study proposes a novel approach to enhance the non-dominated sorting genetic algorithm (NSGA II) by binary conversion using the sigmoid transfer function and a thresholding mechanism for binary feature selection. The objective is to enhance performance in feature selection tasks by improving accuracy and reducing subset dimensions. The efficacy of the proposed algorithm in reducing these parameters was evaluated by comparing it with other methods using four datasets related to breast cancer, hepatitis, heart, and diabetes.

Keywords:
Evolutionary Algorithms, Feature Selection, Feature Dimension Reduction, Genetic Algorithm, NSGAII Genetic Algorithm.

Electronic Medical Record Implementation in a Large Healthcare System from a Leadership Perspective

Yaseen M Arabi
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Abdullah Ali Al Ghamdi
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Mohamed Al-Moamary
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Abdullah Al Mutrafy
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Raed H. AlHazme
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Bandar Abdulmohsen Al Knawy
King Saud bin Abdulaziz University for Health Sciences, Riyadh

Abstract:

Background: Information on the use of change management models to guide electronic medical records (EMR) implementation is limited. This case study describes the leadership aspects of a large-scale EMR implementation using Kotter's change management model.

Methods: This case study presents the experience in implementing a new EMR system from the leadership perspective at King Abdulaziz Medical City, a large tertiary care hospital in Riyadh, Kingdom of Saudi Arabia. We described the process of implementation and outlined the challenges and opportunities, throughout the journey from the preimplementation to the post- implementation phases.

Results: We described the corresponding actions to the eight domains of Kotter's change management model: creating a sense of urgency, building the guiding team, developing a change vision and strategy, understanding and buy-in, removing obstacles, creating short-term wins, building on the change and anchoring the changes in corporate culture.

Conclusions: The case study highlights that EMR implementation is not a pure information technology project but rather is a technical-based complex social adaptive project that requires a specific set of leadership competencies that are central to its success. It demonstrates that change management models might be useful for large-scale EMR implementation.

Keywords:

Leadership, Electronic medical record, Models of change, Leadership approach.

A Diagnostic Model for Non-invasive Urothelial Cancer Detection Based on Urinary Methylation Markers

Tianbao Li
BioChain (Beijing) Science & Technology Inc., Beijing 102600, China

Guangpeng Zhou
BioChain (Beijing) Science & Technology Inc., Beijing 102600, China

Abstract:

Importance: Urothelial cancer (UC) diagnosis methods are typically invasive, whereas urinary cytology-based diagnosis is non-invasive but less sensitive.

Objective: This study aimed to identify differentially methylated markers in urinary tumor DNA to improve sensitivity of non-invasive UC diagnosis.

Design, Setting, and Participants: Significantly hypermethylated UC-associated genes were identified in clinical samples and public UC data. Whole Genome Bisulfite Sequencing (WGBS) and deep methylation sequencing of specific candidates were used to further screen candidate markers in tumor biopsies and urine samples from patients in our clinic. A diagnostic model was constructed from three hypermethylated genomic markers and validated in a cohort of UC, other cancer, benign lesion, and non-UC urinary tract disease patients (n = 432).

Results: Validation in a cohort of 432 subjects revealed that a model constructed from three hypermethylated genes (VIM, TMEM220, and PPM1N), obtained through multiple rounds of screening of clinical samples, public data, and WGBS, could provide 94.44% sensitivity in 108 UC patients, and specificities of 96.34%, 90.76%, and 87.72%, respectively, in 191 non-neoplastic individuals, 76 benign lesion patients, and 57 patients with other cancers, resulting in an overall specificity of 93.52%. Moreover, this three-gene model had 80% sensitivity for detecting stage 0a/0is and 88.57% sensitivity for stage I UC.

Conclusions and Relevance: The three-gene diagnostic model warrants further clinical evaluation and development, based on its high sensitivity and high specificity UC diagnosis in urine. This non-invasive approach also shows strong clinical potential for effective detection of early-stage cancer.

Keywords:

Urothelial cancer, urinary diagnostic model, methylation, Ut DNA, non-invasive diagnosis.

Chemical Insights into a Bioactive Polyphenolic Extract from Camellia Japonica L. Flower

Humaira Khan*
Department of Environmental, Biological and Pharmaceutical Sciences and Technologies, University of Campania 'Luigi Vanvitelli', Via Vivaldi 43, 81100 Caserta, Italy

Simona Piccolella
Department of Environmental, Biological and Pharmaceutical Sciences and Technologies, University of Campania 'Luigi Vanvitelli', Via Vivaldi 43, 81100 Caserta, Italy

Severina Pacifico
Department of Environmental, Biological and Pharmaceutical Sciences and Technologies, University of Campania 'Luigi Vanvitelli', Via Vivaldi 43, 81100 Caserta, Italy

Abstract:

Camellia genus, belonging to Theaceae family, accounts for a broad range of plant species, among which C. japonica L. is one of the most prominent. Historically, these plants have been used for various applications including ornamental purpose, essential oil and tea production, however its exploration in health-care sector is limited. Therefore, herein we present the detailed study on C. japonica L. flower as medicinal plant and its biological activities.

In this context, C. japonica L. flowers, collected from the botanical garden of the University of Campania (Caserta, Italy), underwent ultrasound assisted maceration in formic acid acidified ethanol, and extract obtained was chromatographed on Amberlite XAD-4 resin to achieve an anthocyanin rich fraction (CjA).

CjA fraction was first chemically investigated using spectroscopic (ATR FT-IR, and UV-Vis) techniques, and then profiled by means of Ultra-High-Performance Liquid Chromatography-High-Resolution Mass Spectrometry (UHPLC-HRMS). The fraction, which consisted in anthocyanins (mostly acylated), procyanidins and flavonols, exhibited a marked antiradical activity. In fact, it massively scavenged DPPH radical and ABTS radical cation, with calculated ID50 values equal to 14.2 and 2.1 µg/mL, respectively. Furthermore, cytotoxicity was assessed employing MTT assay towards tested cancer cells. Thus, it can be concluded that the proposed investigation on bio-profile of phenolic compounds from C. japonica L. flower and its potential bioactivities open new insights for its usage in pharmaceutical sectors.

Keywords:

Camellia japonica, polyphenolic extract, cytotoxicity, antioxidant activity.

Severe Brady-Arrhythmias During Bronchiolitis in Infants Younger Than One Year. A Prospective Holter Study

Allon Raphael MD MPH
Department of Pediatrics, Wilf Children Hospital, Sha'are Zedek Medical Center, Affiliated to the Hadassah-Hebrew University Medical School, Jerusalem, Israel

Yechiel Schlesinger MD
Department of Pediatrics, Wilf Children Hospital, Sha'are Zedek Medical Center, Affiliated to the Hadassah-Hebrew University Medical School, Jerusalem, Israel
Pediatric Infectious Diseases Unit, Wilf Children Hospital, Shaare Zedek Medical Center, Affiliated to the Hadassah-Hebrew University Medical School, Jerusalem, Israel

Amiram Nir MD
Department of Pediatrics, Wilf Children Hospital, Sha'are Zedek Medical Center, Affiliated to the Hadassah-Hebrew University Medical School, Jerusalem, Israel
Pediatric Cardiology and Adult Congenital Heart Disease Unit, Wilf Children Hospital, Sha'are Zedek Medical Center, Affiliated to the Hadassah-Hebrew University Medical School, Jerusalem, Israel

Abstract:

Bronchiolitis is a major cause of respiratory illness in infants. Few studies have demonstrated arrhythmia during bronchiolitis, included bradycardia and atrioventricular block, some requiring pacemaker implantation. However, the association between bronchiolitis and cardiac arrhythmias is unclear.

Aim: The purpose of our study was to investigate arrhythmias during bronchiolitis in infants younger than one year

Methods: A single center, prospective cohort study was conducted on infants clinically diagnosed with bronchiolitis. Demographic and clinical questionnaire was performed. Patients were monitored by cardiac Holter overnight during hospitalization. Bradycardia was defined as heart rate <60.

Results: one hundred infan ts were enrolled in the study, most (79%) tested positive to RSV. Arrhythmias were recorded in 18 (18%) infants: Sinus pauses (between 2-13 seconds) in 8 infants and bradycardia down to 60 bpm in another 7 infants. Frequent atrial premature complexes (3%-18% of all beats) in 3 infants. In a follow-up Holter, arrhythmias disappear between one to four months. Analysis of demographic and clinical factors did not reveal any significant risk factors for arrhythmias. No symptoms (including cyanosis, apathy unresponsiveness) or illness severity were predictive to identify arrhythmias.

Conclusion: Our study shows that bronchiolitis is associated with severe bradyarrhythmia, especially sinus pauses and sinus bradycardia. In our study the pathology seems to be resolved. Physicians should be aware of the associated with and reconsider pacemaker implantation after the resolution of the bronchiolitis even in infants with severe bradycardia. Future investigations should focus on possible mechanisms, risk factors and prognosis of this association.

Synthesis and Characterization of Polymeric Biomaterials for Sustainable Agriculture

Kamlesh Kumari

Professor, Department of Chemical Engineering, Sant Longowal Institute of Engineering and Technology, (Deemed to be University), Longowal-148106, Sangrur, Punjab, India

Abstract:

Polymeric materials have long played a crucial role in the agricultural industry, taking on various forms such as films, fibres, gels, and coatings, and becoming indispensable in modern farming practices. Among these, functional polymers like chitosan and its derivatives have been extensively studied for their potential applications in agriculture. This study presents the synthesis of an amphiphilic chitosan-based semi-interpenetrating polymer network (SIPN) hydrogel designed for the controlled release of pesticides. The hydrogel is synthesized from the natural biopolymer chitosan and the monomer acrylic acid, using thiourea as a crosslinker in an autoclave. The polymerization conditions are optimized to achieve the maximum grafting percentage. The swelling behaviour of the hydrogel is analysed, and its properties are characterized using Fourier transform infrared spectroscopy (FT-IR), thermal analysis (TA), nuclear magnetic resonance (1H NMR), zeta potential, and scanning electron microscopy (SEM). The hydrogel's potential for the controlled release of an organophosphate pesticide is also evaluated. Experimental results demonstrate that the synthesized hydrogel can serve as an effective carrier for modulated pesticide release

Determination of the Optimum Binder Content of Hot Mix Asphalt Using Superpave Mix Design Method

Bashir M. Aburawi
Elmergib University, Alhomes, Libya

Abstract:

The selection of appropriate asphalt content is crucial for the design and construction of durable, long-lasting asphalt pavements. The Superpave mix design method has gained significant recognition and acceptance due to its ability to account for various factors affecting asphalt pavement performance. This study focused on utilizing the Superpave mix design method to determine the optimum asphalt content for asphalt mixtures. The research methodology involved a comprehensive laboratory investigation employing a series of tests and analyses to ensure compliance with Superpave specifications. Various asphalt content levels were considered, and the corresponding volumetric properties were evaluated. The Superpave mix design method was then used to assess the performance characteristics of the asphalt mixtures at different asphalt content levels. These performance characteristics included rutting resistance, fatigue cracking resistance and moisture susceptibility. The results of this analysis allowed the researchers to identify the asphalt content that achieved the optimal balance between these performance properties. In conclusion, this research highlights the benefits of utilizing the Superpave mix design method in determining the optimum asphalt content for asphalt mixtures. The findings provide valuable insights for the asphalt industry, supporting the design and construction of long-lasting, resilient infrastructure.

Keywords:

Superpave. Optimum Asphalt Content. Hot Mix Asphalt. Moisture Susceptibility. Indirect Tensile Strength.

Thai Sign Language Fingerspelling Alphabet Recognition Using a Hybrid Approach of Recurrent Neural Networks and Random Forest Classifiers

Yingyos Sriboonruang
Lecturer, Burapha University/Faculty of Science and Social Sciences

Abstract:
This research demonstrates the recognition of the Thai sign language fingerspelling alphabet utilizing a hybrid methodology that integrates recurrent neural networks (RNNs) with random forest classifiers. Sequential data, including hand movements and temporal alphabet variations, can be recorded utilizing Recurrent Neural Networks (RNNs), which provide this function. Conversely, Random Forest classifiers provide strong classification capabilities that can leverage the feature representations acquired by the Recurrent Neural Network (RNN). A comprehensive sign language recognition system is developed using this hybrid methodology, which incorporates the benefits of both methodologies. The proposed approach involves initially training a recurrent neural network (RNN) to extract pertinent features from the input video sequences, followed by inputting those characteristics into a random forest classifier for ultimate recognition. A comprehensive experimental investigation is conducted to assess the efficacy of the hybrid strategy. This analysis illustrates the feasibility of the hybrid strategy and its advantages compared to other state-of-the-art methods.

Keywords:
Thai sign language fingerspelling alphabet, recurrent neural networks, random forest.

The Role of Dentists in the Recognition, Prevention, and Protection of Child Abuse

Elham Hassanli
Dental Graduate Student, Department of Operative Dentistry, Dental School, Islamic Azad University, Isfahan (Khorasgan) Branch, Isfahan, Iran

Eshagh Saharkhiz
PhD student, University of Tehran, Kish International Campus, Kish Island, Iran Dental School, Islamic Azad University, Isfahan (Khorasgan) Branch, Isfahan, Iran.

Abstract:
All physicians and dentists are required to report suspected cases of abuse and neglect to social services or law enforcement agencies and for this purpose, they must be trained. This paper aims to review the dental aspects of physical abuse and the role of dentists in the exploration, evaluation, and reporting of such conditions. Some injuries may seem negligible at first glance and do not need serious medical intervention, but are unlikely caused accidentally and, if not properly distinguished, in many cases precede more severe abusive damages. Dental manifestations of physical abuse include dental fractures, dislocations, dental avulsions, or not physiological mobility; as well as evident dental malocclusions as a result of previous trauma. Therefore, an early diagnosis of child abuse, in a dental practice, could extremely contribute to the identification of violent cases and appropriate intervention.

Keywords:
child abuse, dentist, dental manifestations.

Protecting Elementary School Children from the Epidemic of Myopia (Nearsightedness) in this Era of Technology Use in Academics

Ayaan Seshadri,
Trevor Day School, New York

Abstract:
Did you know 1 in 4 children struggle seeing afar. This number could be one-half by 2050. Myopia or nearsightedness disproportionately affects young children aged 3-10 years, in grades N-5. Paradoxically due to their young age, this demographic group are often incapable of expressing about their advancing disorder coherently enough to get treated. Undetected high myopia is a risk factor for blindness in children. In interviewing families of 20 myopic children ≤10 years of age, we glean that such children begin to believe that their vision going blurry is the new normal for them, and don't report it. 80% of the academic information taught in elementary schools is presented visually; no surprise hence that myopia and learning disabilities are often confused. Through our organization, My Eyes My Life, we aim to go to the busy elementary school teachers and train them to take 10 minutes each semester to familiarize themselves with the signs and symptoms of nearsightedness. A vigilant teacher can flag undiagnosed pediatric myopia often before parents or pediatricians can. Unarguably, early childhood teachers are the first line of defense in our war to save elementary school children from the scourge of this technology-era epidemic

Keywords:
Myopia, nearsightedness, pediatric, learning disability, signs-and-symptoms, teachers.

Experiences and Needs of Teachers at Special Education Kindergarten Regarding Evidence-Based Practices

Assistant Doctor Aynur Gıcı Vatansever
Department of Special Education at Trakya University, Turkiye

Abstract:

Both special education and pre-school teachers are the most important stakeholders in achieving success in special education kindergartens where mainstreaming practices are offered. Special education services offered in Special Education Kindergartens are very important for children with special needs to be able to catch up with their typically developing peers. An important criterion that will lead to successful mainstreaming practices is the special education services offered are scientifically based. Practices without scientific basis will cause material and moral losses to the child with special needs, his family and therefore his teacher. For this reason, it is thought to be extremely important to reveal teachers' current knowledge and needs regarding scientifically based practices. The purpose of this study is to determine the experiences and needs of special education kindergarten teachers regarding evidence-based practices. This study utilized interview technique, a qualitative research method. Descriptive analysis was used in the study to analyze the data collected via interview technique. The themes of this study were the questions used in the study. the frequencies of the views were calculated and parcitipants' views were cited directly.

Keywords:

Special education teachers; special education kindergarten, evidence-based practices; professional development needs; interview.

Test and Item Analysis Competence Perceptions Scale: Validity and Reliability Study

Muge Uluman Mert
Marmara University, Turkey

Abstract:

The aim of this study is to develop a measurement tool that can assess teachers' perceptions of their competencies in test and item analysis. The study group for this scale development research consists of teachers working in public schools in Istanbul, due to the richness of data provided by its cosmopolitan structure and its accessibility for researchers. Data were collected from 428 teachers for exploratory factor analysis, 325 teachers for confirmatory factor analysis, and 92 teachers for test-retest reliability. In developing the scale, the eight-step process recommended by DeVellis (2017) was followed. First, a review of the relevant literature was conducted, and existing measurement tools in this field were examined. Subsequently, items were created to measure teachers' perceptions of their competencies in test and item analysis, and the method of measurement was determined. In order to prepare the measurement tool for pilot application, three expert opinions from the Measurement and Evaluation field were used. Following all evaluations, some items on the scale were revised, resulting in a 22-item five-point Likert-type measurement tool. After the assumptions were met, it was seen that the scale presented a single-factor structure and explained 59.349% of the variance. The factor loadings of the scale items ranged from .612 to .845, with item-total correlations between .655 and .855, and these correlations were statistically significant. The item-rest correlations also ranged from .612 to .838. The Cronbach's alpha coefficient for the total of the scale was calculated as .968. Additionally, a test-retest was conducted with a two-week interval, and the correlation between the two tests was examined. The Pearson correlation coefficient was found to be .975 ($p<.05$). As a result of the confirmatory factor analysis, it is seen that the single-factor structure of 22 items was confirmed. The goodness of fit statistics obtained were found as $\chi 2/sd=1.995$, RMSEA=.057, CFI=.909, GFI=.889, RMR=.042, SRMR=.049, TLI=.899, RNI=.909. These values are considered acceptable (Çokluk et al., 2021; Tabachnick & Fidell, 2013). The measurement invariance of the test and item statistics efficacy perception scale across gender was examined by testing four nested hierarchical models, configural (structural) invariance, metric invariance, scalar invariance and strict invariance. The fact that the obtained $\Delta\chi 2$ values were not significant ($p>.05$), ΔCFI, ΔGamma Hat and ΔMcDonald's NCI values were appropriate can be stated as indicators that configural, metric, scalar and strict invariances were met according to gender. Considering the results of the fit indices, it is accepted that the test and item statistics scale provides full measurement invariance across gender subgroups. For the validity and reliability studies of the measurement tool, content validity, construct validity, measurement invariance, and reliability coefficients were examined, and the findings indicated that the developed scale is valid and reliable. The developed scale is a 22-item, five-point Likert-type, and unidimensional tool.

Remote Calibration of Wattmeter in a Low-Voltage AC Network

R. Deltuva
Kaunas University of Technology, Lithuania

M. Kriuglaitė
Kaunas University of Technology, Lithuania

K. Otas
Kaunas University of Technology, Lithuania

Abstract:

This paper presents and compares several algorithms for selecting optimal averaging intervals for short-term power measurements in low-voltage AC networks. These intervals are crucial in reducing the statistical variance of power estimates, which is essential for the remote calibration of wattmeter's and the accuracy of smart sockets. The research focuses on minimizing fluctuations in power consumption data, which are influenced by various network-connected loads. By analyzing different power averaging interval selection algorithms, the study provides a methodology to enhance the reliability and accuracy of remote calibration processes for wattmeter's in dynamic power quality conditions.

The research presents results that demonstrate the effectiveness of different algorithms in minimizing power estimate variance. The findings indicate that specific algorithms are better suited for certain types of power quality conditions, leading to more accurate power measurements. These results support the feasibility of using the proposed methods for remote calibration and provide guidelines for selecting appropriate averaging intervals in practical scenarios.

Keywords:

calibration, electrical grid, power measurement, smart electricity meter, watthour meters