PROCEEDING OF

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Editorial

We are delighted to extend a warm welcome to all participants attending the International Conference 2024 on 11th – 12th 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 25 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 11th – 12th 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

Development of a Language Translator Model for Yoruba Language using Bidirectional Long Short-Term Memory Encoder

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Abstract:

Nigeria is a nation of vast ethnic diversity, encompassing a multitude of cultures, languages, and values. These differences often present significant communication barriers among its various ethnic groups. In response, Google has integrated several Nigerian languages into its translation model. This study focuses on the development of an automatic speech recognition (ASR) system for theYoruba language, one of Nigeria's indigenous languages. A speech dataset related to medical domain was collected from native Yoruba speakers and subjected to preprocessing to eliminate background noise introduced during the recording process. The preprocessed data was transformed into a speech spectrogram, serving as input to a bidirectional long short-term memory (BiLSTM) model. The hyperparameters of the BiLSTM model were optimized for improved performance. The translation model was evaluated using metrics such as BLEU, METEOR,and ROUGUE. Results demonstrated significant improvements in the ASR model's ability to accurately transcribe and translate Yoruba language speech. This advancement in translation accuracy highlights the potential for better cross-linguistic communication among Nigeria's ethnic groups, fostering greater inclusivity and understanding. This study contributes to ongoing efforts to incorporate underrepresented languages in global translation models, addressing the challenge of language diversity in multilingual societies.

Study of a modified blade using Non-linear Twisted NACA 2415 foil to Improve Horizontal Axis Tidal Turbine Performance

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Abstract:

Renewable energy is crucial for mitigating environmental concerns posed by non-renewable energy resources like fossil fuels. Among renewable energy resources, tidal energy is promising, with significant potential in rural islands like Pagerungan Kecil, Indonesia, which offers an ideal environment for harnessing tidal energy. Tidal turbines are effective for this purpose, though further modifications are necessary to enhance their performance. This study aims to investigate the performance of modified Horizontal Axis Tidal Turbines, focusing on the rarely used NACA 2415 foil. The investigation involves nonlinearly twisting the blades, which is expected to improve performance. Non-linear twists create a non-uniform twisting angle that suits the necessitated orientation according to the blade division's location. This ensures maximum tidal energy conversion thus power extraction. However, the designing process of a large number of blade divisions produces uncertain results as the concept is not well understood. The evaluation uses Computational Fluid Dynamics (CFD) simulations which are conducted using OpenFOAM, to examine two distinct turbine designs: the original NACA 2415 foil and a modified version (OptA). Comprehensive numerical analyses, including meshing, boundary conditions, and turbulence modeling, utilize the Reynolds Averaged Navier-Stokes (RANS) equations coupled with the k-ε turbulence model. Contour analysis reveals distinct flow patterns and pressure distributions around the turbines, demonstrating the advantageous characteristics of the OptA design in mitigating turbulence and enhancing performance. Velocity analysis further supports these findings, showing smoother flow patterns and reduced disruption for turbines equipped with twisted OptA blades. Performance evaluations, based on torque and power coefficient (Cp), indicate significant improvements with the OptA design across various Tip Speed Ratios (TSR), particularly at TSR 5. These findings underscore the potential of modifying foil profiles, such as the twisted NACA 2415, in increasing turbine efficiency and power output, achieving a 44.2% increase in the power coefficient and a maximum power output of 8.6 kW.

Keywords:

Computational Fluid Dynamics, NACA 2415, Horizontal Axis Tidal Turbine, OpenFOAM, Ocean Renewable Energy.

The Capacity for Flood Risk Reduction in Warin Chamrap Town Municipality, Ubon Ratchathani Province, Thailand

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Abstract:

This research aims to 1) study flood risk reduction methods of Warin Chamrap Town Municipality, 2) examine the flood management capacity of Warin Chamrap Town Municipality, and 3) propose guidelines to enhance the flood risk reduction capacity of Warin Chamrap Town Municipality, Ubon Ratchathani Province. This study employs qualitative research methods. Key informants were selected through purposive sampling, including 10 executives and staff members of Warin Chamrap Town Municipality involved in disaster prevention and mitigation, 2 executives and staff members from the Ubon Ratchathani Provincial Disaster Prevention and Mitigation Office, and 15 community leaders or representatives from flood-prone areas. Research tools included interviews, focus group discussions, and observations. Data was analyzed using content analysis.

The study findings revealed that: 1) Warin Chamrap Town Municipality employs structural flood risk reduction methods such as using flood walls, and non-structural methods such as evacuation warnings and specific plans to assist flood victims. 2) Warin Chamrap Town Municipality demonstrates good capacity in flood management before, during, and after flood events. 3) Recommendations for Warin Chamrap Town Municipality to enhance its flood risk reduction capacity include structural measures such as building two-story houses for communities and raising the height of flood walls, and non-structural measures such as improving the accuracy and reliability of the evacuation warning system, providing training on water level monitoring, and managing temporary evacuation areas.

Keywords:

Flood risk reduction; Capacity; Thailand.

Screening and Evaluation of Pyrimidinyl Piperazine Carboxamide Derivatives as Anti-Cancer Agents against Triple-Negative Breast Cancer

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Abstract:

Triple-negative breast cancer (TNBC), a highly aggressive subtype of breast cancer, encounters critical therapeutic challenges due to the absence of molecular targets that enable hormonal or HER2-targeted therapy. Chemotherapy remains the standard treatment, but its efficacy is often hindered by poor specificity, high toxicity, and the emergence of drug resistance, leading to unfavorable clinical outcomes. As a result, the development of novel therapeutic agents targeting key molecular pathways involved in TNBC progression is ongoing. In the past decade, pyrimidine, piperazine, and carboxamide-based scaffolds have gained considerable interest in cancer drug development, with several FDA-approved chemotherapeutic agents utilizing these structures. This study focused on screening and evaluating the anti-TNBC activity of novel pyrimidinyl piperazine carboxamide derivatives. Among twelve compounds tested, five derivatives containing trifluoromethyl and/or chlorine substitutions at the meta- and/or para-positions of the phenyl ring displayed strong growth-inhibitory activity, with IC50 values below 30 μM and 5 μM for MDA-MB-231 and Hs578T cells, respectively. Compound NH-93 emerged as one of the most promising anti-TNBC candidates and was selected for further investigation. The results revealed that NH-93 significantly inhibited tumorsphere formation, migration, invasion, and cell proliferation in MDA-MB-231 and Hs578T cells. Furthermore, quantitative PCR analysis demonstrated that NH-93 downregulated the expression of genes associated with cancer stemness (OCT4, SOX2, SALL4, NANOG, and CD44), migration and invasion (ZEB1, TWIST, SNAIL, and MMP9), and survival (c-MYC, BIRC5, and BCL-xL), while upregulating the expression of a pro-apoptotic gene (BAX). These findings highlight the potential of pyrimidinyl piperazine carboxamide derivatives, particularly NH-93, as novel anti-TNBC agents. This is the first report of these scaffold compounds exhibiting such activity against TNBC. It paves the way for further studies on their mechanisms of action and in vivo anti-cancer efficacy.

Certain Bi-Univalent Function Subclasses Defined By (P, Q)-Derivative Operator Subordinate to Lucas-Balancing Polynomials

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Abstract:

Our current study is primarily driven by the abundance of fascinating and productive applications for a broad class of special polynomials. One such special polynomial is the Lucas-balancing polynomials, which have recently been examined in geometric function theory. This paper's main goal is to introduce and study two subclasses of analytic and bi-univalent functions defined by the (p, q)-derivative operator subordinate to Lucas-Balancing polynomials. We obtain the estimates for function coefficients |d2| and |d3| of the newly created classes. We also estimate the Fekete-Szeg¨o problem |d2 −µd2 3 |, µ ∈ R for functions in these classes. We also present a number of findings from our research and draw attention to relevant connections with earlier findings.

Keywords:

Bi-univalent, (p, q)-derivative operator, Subordination, Lucas-Balancing polynomials, Fekete-Szeg¨o functional.

Evaluation of Technological Properties of Some Local Meat's Lactic Strains and Studying Their Potential Bacteriocinogenic

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Abstract:

The use of lactic starters in food fermentation reorients microbial ecology in the product and permits to have the proceeds of the hygienic and stable sensory quality. The aim of this study is to evaluate the technological properties of some meat's lactic strains. We characterized the strains and their antagonistic against contamination's microorganisms and a characterization's test of bacteriocins. We have studied the technological properties of the best stains: the acidic ability, proteolytic and lipolytic, the research of nitrate reductase activity and the sensibility to antibiotics. Among the seventeen lactic strains studied, three strains belong to the genus Lactobacillus (S3E8, S1''E1, S4''E1) are more antagonistic against pathogenic bacteria; they are qualified performance. The research for lactic acid bacteria producers of bacteriocins by the well diffusion method, using with five reference strains Listeria monocytogenes ATCC 15313, Bacillus cereus ATCC 10876, Enterococcus feacalis ATCC 49452, Staphylococcus aureus ATCC 25923, Acinetobacter ATCC 19606 and two endogenous strains, Edwardsiella tardae and Staphylococcus sp gave negative results for all strains studied. Nine (9) strains: Lactobacillus (S4 '' E1, S1''E1 (k1), S11E6, S3E8), Enterococcus (S9E2, S5E5, S6E5, S2E9) and Pediococcus (S4E4) among seventeen (17) strains tested have shown a strong and large spectrum of inhibition against Fusaruim oxysporum albedinis. The result of technological properties indicates that all the three strains show a good performance to acidifying, proteolytic and lipolytic activities.

A Survey into Opinions on Role-Play Between Humans and Between Human-AI

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Abstract:

Games like interactive fictions, visual novels and role-playing games have been used as a medium for dynamic storytelling since late 1970s, where players are able to explore the fictional world simulated in it and experience the story of the world by reaching multiple endings. The process of playing these games repetitively to experience different endings can be very tedious for players due to the repetitive dialogues and dialogue options, and as such, finding a solution to solve the issue of tedious, repetitive gameplay in story-driven games is needed. In this paper, a possible solution to this problem is discussed, with a preliminary experiment done as an introduction to the possible solution is done by having a few respondents compare the quality of two role-play conversations done using the same scenario and same two characters, with one conversation done between two experienced role-players, and another conversation done between one experienced role-player and an AI NPC that is able to generate human speech. The result of this preliminary experiment showed that 75% of the respondents preferred the role-play conversation between human and AI, indicating that the possible solution proposed may be viable for further development.

Ave Satani Song in the Omen Film: A Musicological Analysis

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Abstract:

No horror music film has won the Best Original Song in the Academy Award. Gold Smith's Ave Satani in Richard Donner's film, The Omen, was not the winner of the original song, but it was the only horror film music nominated for the category. This research aims to reveal the uniqueness hidden behind the song through a musicological approach. This study uses a qualitative musicological method to uncover these unique musical elements. The study concluded that, in addition to serving as the film's opening and closing credits illustrations, the song also had an essential role in reinforcing the antagonistic atmosphere between the church and the demons in the film.

Keywords:

horror film, musicology, theme song.

Dance for Global Peace: Cultivating Social Responsibility and Leadership in University Students

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Abstract:

This qualitative research will explore the potential of using dance improvisation activities to raise students' awareness of social responsibility and assess the impact of enhanced social responsibility on their leadership for social change. To tackle the social apathy in university students, this study utilized the Servant Change Leadership Model to develop social responsibility among students in higher education. Based on the foundation of the existing Social Change Model of Leadership Development (SCM) and Servant Leadership, this model emphasizes the importance of values, responsiveness to various needs, and collective purpose for effective systemic change. In addition, dance arts is integrated within the framework to shed light on using Creative and Body-Based Learning (CBL) Pedagogy to enhance students' learning for fostering social responsibility through engaging experiences. This study employs action research, conducted through a triangulation of surveys, observations, video recordings, and semi-structured interviews.

Keywords:

Social change, Peace, Leadership, Art-based Pedagogy, Education.

Isolation and Characterization of Cyanide-Resistant Bacteria from Gold Leaching Effluents for Sustainable Bioremediation: A Case Study with Pseudomonas aeruginosa and Bacillus subtilis

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Abstract:

The accumulation of synthetic chemicals in ecosystems due to industrial, agricultural, and domestic activities poses significant environmental and health risks. Chronic exposure to heavy metals and cyanide compounds, prevalent in industrial wastewater, can lead to severe human health issues and ecological damage. Traditional treatment methods for cyanide contamination, including chemical and physical processes, often face operational challenges and environmental drawbacks. Thus, there is a critical need for effective and sustainable remediation technologies.

This study isolated and characterized cyanide-resistant bacteria from soil contaminated by gold leaching effluents. Soil samples were collected from Alborz Province and inoculated into nutrient broth with increasing cyanide concentrations to select for resistant strains. Molecular identification of isolates was performed using 16S rRNA gene sequencing. Biodegradation capacity was assessed by culturing the bacteria in media containing varying cyanide concentrations and carbon/nitrogen sources. Cyanide reduction was quantified using EPA-approved distillation and colorimetric methods.

Two cyanide-resistant bacterial strains were identified: Pseudomonas aeruginosa (S1) and Bacillus subtilis (S2). Pseudomonas aeruginosa S1 demonstrated a significant cyanide reduction of 68% in the presence of 1% dextrose as a carbon source and 300 ppm cyanide as the sole nitrogen source. In contrast, Bacillus subtilis S2 achieved lower reductions, with no significant statistical difference. Statistical analysis confirmed the high efficacy of Pseudomonas aeruginosa S1 in cyanide degradation ($p < 0.05$), whereas Bacillus subtilis S2's performance was not statistically significant.

This study highlights the potential of Pseudomonas aeruginosa as an effective bioremediation agent for cyanide-contaminated environments, particularly when utilized with appropriate carbon sources. The findings contribute to the development of sustainable bioremediation strategies, leveraging microbial capabilities to address toxic pollutant challenges. Future research should explore the integration of such microorganisms into bioremediation practices to enhance environmental and human health protection.

Keywords:

Bioremediation, Heavy Metal Contamination, Microbial Degradation, Cyanide Reduction.

Customer-centric Public Service Delivery in Hungary

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Abstract:

The digital age of the 21st century brings with it new technologies, innovations and trends. Digital government is about using information and communication technology tools and systems to deliver digital public services to citizens and businesses faster, cheaper and more customer-oriented.

Over the last two decades, Hungary has implemented various reforms to modernise its public administration by advocating the establishment of institutions and policies to improve the quality of services. The author presents good practice related to the digitalisation of public administration and services in Hungary. The basis of digital government is an electronic customer service system (front-office system) and a system that supports internal processes and administrative procedures (back-office system).

Hungary's digital public services are brought together as a technical interoperability platform through mobilised integrated service contact centres, known as Government Window Buses, which is a central electronic administration service designed for the coordination of databases and the interoperability of IT systems. How has Hungary contributed to digital government? What results have been achieved in the area of customer-oriented public services? The survey was conducted to answer these questions. The results obtained in the area of customer relations, based on the opinions expressed by government officials, confirm that digital development has had an impact on customer services and has made public administration more customer-oriented.

Enhancing Public Health Through Effective Management and Policy Frameworks

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Abstract:

Public health policies and management are crucial components in promoting and safeguarding community health. These frameworks involve the formulation, implementation, and evaluation of strategies designed to address various health challenges at the population level. Effective public health policies are grounded in evidence based research and aim to prevent disease, prolong life, and promote health through organized efforts and informed choices. Management within this realm involves the coordination of resources, services, and stakeholders to achieve health objectives efficiently and equitably.

This abstract explores the integral aspects of public health policies and management, including policy development processes, stakeholder engagement, and the role of data in decision-making. It highlights the importance of integrating interdisciplinary approaches and adapting to emerging health threats and changing social needs. Key themes include the balance between preventive and curative approaches, the impact of socio-economic determinants on health outcomes, and the significance of equitable access to healthcare services.

The effectiveness of public health policies is contingent upon robust management practices that ensure timely responses to health crises, efficient use of resources, and accountability in service delivery. This abstract underscores the need for continuous evaluation and adaptation of policies to address evolving health landscapes, and the role of innovation and technology in enhancing public health management. By understanding and addressing these elements, public health systems can better navigate complex health challenges and improvise population health outcomes.

Effective Management and Policy Frameworks for Public Wellness

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Abstract:

Public health policies and management are crucial components in promoting and safeguarding community health. These frameworks involve the formulation, implementation, and evaluation of strategies designed to address various health challenges at the population level. Effective public health policies are grounded in evidence based research and aim to prevent disease, prolong life, and promote health through organized efforts and informed choices. Management within this realm involves the coordination of resources, services, and stakeholders to achieve health objectives efficiently and equitably.

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The Use of Migratory Flows in Defining the Identity of the Italian Far Right

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Abstract:

There are at least two right-wing parties in Italy (often referred to as the extreme right). Both are part of the government of Prime Minister Giorgia Meloni (who took office on 22 October 2022). The Prime Minister herself comes from a neo-fascist movement and party, or still very close to the past fascism revived in the 1970s. The party she leads (and which is run almost like a family by her inner circle) is called Fratelli d'Italia, a name that recalls both the bellicose Italian national anthem and the idea of a nation-state in which blood is the 'glue' that binds together a country that, at the time of its unification, consisted of at least fifteen states (even under different powers: for example, the North, which was part of the Austro-Hungarian Empire, and the South, which was under the Spanish Crown with the Bourbons).

F. d'I. is joined by the League party. This party is also personalised (the reference is entirely to its leader, Matteo Salvini) and, although it is based on a federalist ideal, it is fully committed to an iron nationalism.

Both parties claim the primacy of "defending the borders" against "masses of irregular immigrants" and of propaganda (bordering on racism) against "immigrants", often associated with crimes (serious or otherwise). There is also, for both parties, a folkloric view of Italian traditions (often Catholic) that defines a distance that is considered 'natural' towards many nationalities present on Italian soil. On the other hand, flows from North Africa are emphasised, which are considered 'more dangerous' because they are more visible than the Balkan route, which also crosses Italy and involves a greater number of people.On the other hand, migratory flows are significantly underestimated compared to the data on Italian emigration, which is rarely discussed, especially by young people, who are increasingly taking advantage of the historical tendency of Italians to emigrate.

Faced with these challenges, the League tends towards the propagandistic use of the 'home coasts', trying to physically keep out migrants in the Mediterranean, while the Brothers of Italy present themselves as the 'party of government' (and majority), trying to move the process of rejection towards externalisation. Along these two lines, both parties have 'united' in the fight against the judges who prosecuted former Interior Minister Salvini for leaving an NGO boat loaded with migrants at sea for days without letting it dock, and now the whole government (led by the very politically engaged Prime Minister) on the experiment of using a piece of Albanian soil (which becomes de facto extraterritorial) to first bring people rescued or intercepted in the Mediterranean, in order to "process" them with a much faster "rite" that foresees problems both on the human rights front and in terms of conflict with European laws.In response to these problems, the two parties are trying (through government action) to implement a pro-natalist policy and not to change the rules on citizenship, which favour the 'bloodline' and which, until now, have made it almost impossible for immigrants (even second-generation immigrants) to have their citizenship recognised and for their descendants (even very distant descendants of people who emigrated more than 50 years ago) to be granted citizenship. The latter are also granted the right to vote.

As a result of all this, the two right-wing Italian parties currently in power have made it clear in their political choices that they will not change the procedures for granting citizenship to migrants, but will

instead pursue a "pro-natalist policy" that will lead them to hope for a reversal of the pension system (although this will only happen in a generation).

The two parties have both come into conflict with the judiciary in a clash over immigration that is only partly about this issue and much more about managing the boundaries between Italian and European law, but above all between 'judges and politicians', perhaps foreshadowing a clash over the division of powers.

Keywords:
Fratelli d'Italia; Italian parties; Lega; Migration; Meloni.

Information About Female Journalists and Workers in the Newspaper Er Zhong (1988-2008): A Study from the Feminist Perspective

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Abstract:

This investigation focuses on studying the information offered by the Chinese newspaper Er Zhong about two labor roles of women, i.e., journalists and workers. Our study motivates us to find, in areas and forms of reporting, whether the female journalists suffer discrimination, and to what extent the information reproduces gender stereotypes. Qualitative analysis is carried out from the feminist perspective. A sample of 1185 articles published in print editions in 1988, 1998 and 2008 has been examined. In this context, the subordinate representation of female journalists and workers is analyzed, then sexist gender strategies are identified. It is observed that it's necessary to involve gender perspective and technological knowledge in training newspaper reporters, so as to avoid gender-biased language and respond to the demands of the workers in time.

Keywords:

journalistic information, female journalists and workers, feminist perspective, gender stereotype, heavy industry.

Experimental Optimisation of Hydraulic and Solids Retention Time in Sequencing Batch Reactor Operations

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Abstract:

The aim of aerobic biological wastewater treatment processes is to treat influent wastewater with the highest possible reduction of organic matter, with the minimum possible size of the reaction tank and the minimum possible oxygen consumption. About 40 to 50 per cent of a wastewater plant's total energy usage can be attributed to the aeration process. In this study, an experimental analysis of the effect of hydraulic retention time (HRT) and solids retention time (SRT) on sequencing batch reactor (SBR) process was carried out with the aim of finding the minimum values that minimize the SBR volume and maximize the organic loading rate (OLR). Two model wastewaters, glucose and ethanol, were used in the study. Eleven different experimental runs (HRT in the range of 0.25 – 4 days and SRT of 1 – 65.3 days) were carried out with the glucose wastewater. Nine experimental runs were carried out with ethanol wastewater (HRT in the range of 0.5 – 4 days and SRT of 1 – 73.6 days). The minimum HRT and SRT values for the successful operation for glucose wastewater were 0.25 days and 3.1 days respectively while the minimum HRT and SRT for ethanol was 0.5 days and 4.9 days respectively. The highest OLR which gave successful process performance were 4.28 g COD/l.day and 4.14 g COD/l.day for glucose and ethanol wastewaters respectively, which are among the highest reported in the literature for aerobic conventional dispersed-growth processes. The oxygen consumption and biomass production were calculated for the all the runs. The minimum oxygen consumption was 0.36 and 0.69 kg O2/kg COD removed for glucose and ethanol, respectively. It was found that, oxygen consumption increased with SRT and OLR while sludge production decreased at longer SRT and higher OLR.

Keywords:

Sequencing Batch Reactor, HRT, SRT, Oxygen consumption, COD, OLR.

Synthesis, Optimization and Characterization of Carboxymethyl Cellulose from Hybridized Agricultural Wastes

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Abstract:

Carboxymethylcellulose (CMC) exhibits extensive commercial relevance across various sectors including oil and gas, cosmetics, food, and pharmaceuticals; however, the prevailing industrial methodology for its synthesis from lignocellulosic biomass demonstrates low sustainability and efficiency. The synthesis of CMC from cellulose generated from agricultural waste materials-more precisely, from a combination of sugarcane bagasse and corncob is reported in this study along with the statistical optimization related to this process. The combined application of a mild alkaliperoxide treatment proved effective for the isolation of cellulose characterized by moderate crystallinity, which was subsequently modified into CMC via the Williamson-ether synthesis. A series of carboxymethylation experiments, determined by Response surface methodology equipped with Box-Behnken design, were conducted to evaluate the independent variables including NaOH concentration, reaction time, the dosage of the etherifying agent, and the categorical factor as solvent for synthesis (ethyl acetate and diethyl ether). Utilizing FTIR, distinctive absorption patterns of CMC were identified, revealing fingerprint bands associated with the absorption and dispersion phenomena of carboxymethyl groups, signifying effective carboxymethylation. XRD measurements indicated that the mild treatment yielded CMC with a considerable proportion of amorphous and type II celluloses. SEM images elucidated the morphological characteristics of the prepared CMC, showcasing reduced surface roughness. The TGA/DTA data pertaining to the CMC illustrates its thermal stability. In contrast to previous research, the results of the analysis of variance derived from the response surface methodology data demonstrated high precision (p-value <0.0001; R2=0.9666; SD<0.03) and accuracy (characterized by low regression residuals), confirming the extracted waste celluloses' potential for CMC production under mild conditions to produce this high-value biopolymer within the context of industrial chemistry. Hence, the optimized process is characterized by increased sustainability, decreased cost, and higher efficiency.

Keywords:

cellulose, Carboxymethyl cellulose, optimization, characterization, crystallinity.

Enhancing Agricultural TVET Through Technology and Industry Synergy: Next-Generation Workforce Development in Penang

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Abstract:

Penang has seen an increasing focus on transforming its agricultural sector to align with modern technological advancements and sustainability goals. This transformation is critical as Penang seeks to reduce its dependence on other states for food and to create a sustainable local food system. Technical and Vocational Education and Training (TVET) offers a unique platform to prepare a skilled workforce capable of supporting agricultural innovation. This study aims to critically assess and advance the integration of agricultural content within TVET programs in Penang. Given agriculture's essential role in regional food security and economic sustainability, there exists a significant misalignment between current TVET curriculum and the sector's evolving needs. Employing a qualitative research approach, including in-depth interviews with TVET educators, industry practitioners, government officials, students, and agricultural entrepreneurs, this study elucidates key challenges and opportunities in embedding contemporary agricultural practices into TVET programs. Findings reveal substantial gaps in curriculum relevance, industry engagement, and technological integration. The study proposes targeted reforms, such as curriculum modernization to include advanced farming techniques, sustainable practices, and technological innovations. Recommendations include fostering robust industry-education partnerships, enhancing public perceptions of agricultural careers through strategic awareness campaigns, implementing targeted financial and non-financial incentives, and investing in advanced technological infrastructure. The study also emphasizes the necessity of supportive policy frameworks and continuous program evaluation to ensure alignment with sectoral demands. This research provides a comprehensive framework for stakeholders to enhance TVET programs, thereby equipping graduates with the requisite skills for the evolving agricultural sector in Penang.

Keywords:

Agriculture, Industry, Technology, TVET, Workforce Development.

Veterinary and Livestock Resource Management and Aquaculture in Cameroon

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Abstract:

Cameroon's veterinary and livestock resources is still in the elementary stages compared to other parts of the world since aquaculture was introduced in 1948 and the maritime fishing in the 1950s. Recent research has shown that more than 600 marine species of local fishes and, with signs of interest shown by the government through the creation of University Institute of Fisheries in Yabasssi; Department of Veterinary, Livestock and Water Resources Management in the University of Buea that provide young scientists that are coming up in fisheries and aquaculture from Bsc to PhD programmes.

Cameroon has a coastline of 350km, starting from Lobe Falls in the South to the Akwafae in Mundemba. Sustainable water management and aquaculture in Cameroon is undergoing some distress factors, though:

1) Lack of Enough Halieutic Research Centres
1) Lack of Enough Funds from the Ministry of Livestock, Fisheries and Animal Husbandry
3) High demands that exceeds supply of fish stocks, including imports
4) Destruction of Marine Biodiversity by Foreign Fishing Vessels and cutting down of mangroves marine ecosystem, amongst others.

Maritime in Cameroon has more than 600 species of fishes which makes it one of the richest ecosystems in the world. Batoke, bordering the Atlantic Ocean, is the pioneer maritime research centre before its transformation into an agro-pastoral research centre. It was followed by numerous other centres such as the Institut de la Researche Agronomiqure pour le Developpement (Institute of Agronomic Research for Development), IRAD. They are:

- IRAD Ekona
- IRAD Bagante
- IRAD Kribi on Halieutique.

Marine science and Aquaculture have also seen its rise and fall after its introduction in the 1960s by the French. It declined continued until in 2000 the government of Cameroon through the Ministry of Livestock, Fisheries and Animal Husbandry decided to innovate, to increase the production and consumption of fish stocks in Cameroon.

To this effect, some veterinary training centre schools were created in Foumban, Jakiri and Maroua; and lately the University institute of Fisheries Science in Yabassi; we have the faculty of Veterinary Medicine in the University of Ngaoundere; and more recent University of Buea as the government tries to fight against IUU (Illegal, Unreported, Unregulated) fishing on the coastline and creeks of Cameroon.

In aquaculture, to innovate the government has created the departments of animal production in almost all the state universities. Measures also undertaken is to improve on seed production and through the creation of intensive fish seed production units at Douala, Logbaba and Bamenda.

Measures have also been put in place to ameliorate the problem of demand exceeding supply of fish by a strategy to produce 25.000 tonnage of fish yearly and encouraging fish farming by subsidizing the prices of equipment and materials, through imports.

The veterinary and livestock, and the aquaculture sector as a whole in Cameroon is struggling to produce viable seeds for fish farmers due lack of funds and equipment which have hindered the zeal for research. In this respect there's a need for partnership. Remedial attempts are welcome through support those who want to assist in safeguarding the marine ecosystem in Cameroon!

Artificial Neural Network Approach for GIS-Based Soil Macro-Nutrients Mapping

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Abstract:

Conventional methods for nutrients soil mapping are based on laboratory test of samples that are obtained from surveys. Time and cost involved for gathering and analyzing soil samples are the reasons that researchers use predictive soil mapping (PSM). PSM can be defined as the development of a numerical or statistical model of the relationship among environmental variables and soil properties, which is then applied to a geographic data base to create a predictive map. Kriging is a group of geostatistical techniques to spatially interpolate point values at an unobserved location from observations of values at nearby locations. The main problem using kriging as an interpolator is that it is excessively data dependent and requires a large number of closely spaced data points. Hence there is a need to minimize the number of data points without sacrificing the accuracy of the results.

In this research, an artificial neural networks (ANN) scheme was used to predict macro nutrient values at unsampled points. ANN has become a popular tool for prediction as it eliminates certain difficulties in soil property prediction such as the non-linear relationships and non-normality. Back-propagation multilayer feed-forward networks structures were used to predict nitrogen, phosphorous and potassium values in soil of study area. A limited numbers of samples were used in the training, validation and testing phases of ANN (pattern reconstruction structures) to classify soil properties and the trained network were used for prediction. The soil analysis results of samples collected from soil survey of the block C of Sawah Sempadan, Tanjung Karang rice irrigation project at Selangor of Malaysia were used.

Soil maps were produced by the kriging method using 236 samples (or values) that were a combination of actual values (obtained from real samples) and virtual values (neural network predicted values). For each macro nutrients elements, three types of maps were generated with 118 actual and 118 virtual values, 59 actual and 177 virtual values, and 30 actual and 206 virtual values respectively. To evaluate the performance of the proposed method, for each macro nutrient element, a base map using 236 actual samples and test maps using 118, 59 and 30 actual samples respectively produced by the kriging method. A set of parameters was defined to measure similarity of the maps which were generated with the proposed method termed as the sample reduction method.

The results show that the maps which were generated through the sample reduction method were more accurate than the corresponding base maps produced through smaller number of real samples. For example, nitrogen maps that were produced from 118, 59 and 30 real samples have 78%, 62%, 41% similarity respectively with the base map (236 samples) and the sample reduction method increased similarity to 87%, 77%, 71%, respectively. Hence, this method can reduce the number of real samples and substitute ANN predictive samples to achieve the specified level of accuracy.

Keywords:

artificial neural network, kriging, pattern recognition, precision farming, soil mapping.

AI and Dentistry: Any New Solutions for Old Problems

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Abstract:

Even for experienced practitioners, the augmentation of the implant sites remains a challenging task. The longevity of the implant, health of supporting tissues, and patient comfort are closely related to how sound was the grafting decision. Bone regeneration is something far beyond the simple placement of a tissue or material on a defective alveolar zone; a fact that warped the topic into a confusing call in dentistry. The thorough regenerative methodologies described in the literature made the practice of implant site augmentation even more intimidating. Understanding the biological behavior of bone substitutes and the recipient site strengths and weaknesses makes the plan for implant site augmentation well-defined and predictable. The purpose of this article is to set a path for understanding and deciding the regenerative plan of a defective ridge in a simple evidence-driven approach. Conclusion: Keeping a clear picture of what the ridge augmentation process in a given situation should be like, is very rewarding in terms of time-saving, predictability, and patient comfort.

Patient Journey of Dental Treatment Under General Anaesthesia for Paediatric Patients with Autism Spectrum Disorder

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Abstract:

General anaesthesia (GA) may be required to undertake dental treatment for children with special needs including Autism Spectrum Disorder (ASD) Learning Disabilities (LD) and Global Developmental Delay (GDD). It may be required due to behavioural challenges, severe dental anxiety or phobias and extent of dental treatment needed. Guidance is needed for teams delivering dental treatment for paediatric patients with Autism using GA due to the potential risks, implications, and costs of using GA to deliver effective dental care ensuring smooth journey for patients and families. This article aims to present evidence-based recommendations for teams involved in providing GA for dental care to patients with ASD and special needs. The need for comprehensive and person-centred assessment and planning should be prioritised. Thorough assessment for every stage (starting from initial dental consultation to recovery and discharge post-operatively) to ensure safe and effective dental and medical care.

Keywords:

Autism Spectrum Disorder; General Anaesthesia; Dental Treatment; Holistic approach; Tailored treatment.

A Comprehensive Diabetes Monitoring Device for Enhanced Health Management

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Abstract:

Diabetes mellitus (DM) is a prevalent global health concern, necessitating effective monitoring and management solutions. This study introduces a novel Comprehensive Diabetes Monitoring Device (CDMD) and a dietary monitoring device, designed to enhance health management for individuals with diabetes and those seeking to improve their dietary habits. The CDMD integrates continuous glucose monitoring with personalized health insights and activity tracking, providing real-time data for informed health decisions. Similarly, the dietary monitoring device aims to simplify the process of dietary monitoring, allowing users to effortlessly track their food intake and make informed decisions based on consumption data. Both devices prioritize userfriendliness and portability, aiming to seamlessly integrate into users' daily lives and enhance their overall quality of life. Through thorough analysis and user feedback, these devices offer promising solutions to current monitoring challenges and contribute to the ongoing efforts to improve health management.

Keywords:

Diabetes mellitus, Comprehensive Diabetes Monitoring Device (CDMD), Dietary monitoring device, Health management, Continuous glucose monitoring, Nutritional management, Userfriendly design, Real-time data insights, Portability, Quality of life.

The Impact of Covid-19 in Hotel Industry of Sylhet in Bangladesh and The Strategies to Ensure Its Business Sustainability

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Abstract:

The study examines the impact of Covid-19 pandemic in the hotel industry in Sylhet region in Bangladesh developing linkage between hotel industry and the effects of the pandemic. This research is focused on Sylhet region, one of the developing tourism centers that needs urgent countermeasures from local, national, and policymakers to lessen the negative effects of the continuing coronavirus pandemic. The collected data are analyzed using statistical techniques. Based on findings, this research relates the impact of the pandemic in its impact towards business revenue, customer behavior and the need for sustainable business strategies of Sylhet hotel industry in Bangladesh. The findings, discussions and recommendations of this paper are expected to add value for researchers and practitioners of the hotel industry of Sylhet in Bangladesh.

Keywords:

Covid-19 Pandemic, Sylhet Hotel Industries, Business Revenue, Customer Behavior, Sustainable Business Strategies.

Uttar Pradesh on Newer Development Landscape: A Geographical Overview of Urban Policy, Economic Growth Planning and the Emerging Strategic Pathways

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Abstract:

The state has witnessed a tremendous amount of developmental pressures and the politics of socio-spatial transformation over the last few decades. Much of this change is driven by the cities and towns and their interconnected space in Uttar Pradesh. State plays a significant part in social, cultural, political life of the country. This has not been coupled with the urbanization levels, economic development and enrichment of urban social well being. The state has level of urbanization (22.28%) which is below the national average (31.16%). Being the epitome of slower pace of urbanization and economic development, state has been seen playing a pivotal role in the Idea of socio-spatial justice and making processes more inclusionary in urban development and planning. Historical analysis shows that politics behind social assertion has impacted urban development practices a lot and urban planning too in the state. Recently efforts have been made to transform urbanscapes and urban economy and enhance social participation. The focus of present urban policy is towards revival of major urban growth centres and linking them with the broad urban transformation agenda of the state and country. The emerging avenues include tackling issues and concerns of urban local bodies, capacity constraints, refurbishment of infrastructure, and urban governance to promote urban sustainability. This unprecedented move in urban development paradigm in Uttar Pradesh has geographical implications, socio-demographic impacts and economic ramifications. The present study is designed in the conceptual framework of constructivism and critically deals with the changing urban development policy and spatial planning in the state. The methodologically, this study is based on secondary sources of data, literature and case studies.

Keywords:

cities and towns, socio-spatial justice, sustainability, transformation, urbanization, urban development paradigm, urban economy.