

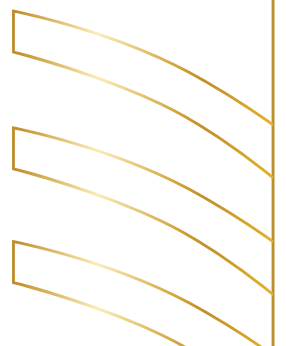
RESEARCH METRICS
COMMITTEE (RMC)



Inspiring Excellence

*Promoting
Research
Excellence*

**QUALITY
JOURNAL
PUBLICATION
AWARD
2025**



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academic journals Q1(top 10%), 74 articles

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Message from the Chief Guest



It is with great pride that I acknowledge a commendable milestone in the academic landscape of our country—the introduction of the Quality Journal Publications Award at BRAC University. This initiative reflects not only the university’s dedication to promoting research excellence but also its broader commitment to national development and global knowledge creation.

BRAC University has long stood as a beacon of higher education in Bangladesh, consistently aligning its mission with the values of equity, innovation, and societal progress. Guided by the visionary legacy of its founder, Sir Fazle Hasan Abed, the university has embraced education not merely as a means to individual advancement, but as a powerful tool for uplifting communities and transforming society.

Through initiatives like the Quality Journal Publications Award, BRAC University is setting a benchmark for academic integrity, scholarly contribution, and research that addresses the pressing challenges of our time—be it public health, climate change, or social justice. This award exemplifies the university’s efforts to strengthen its research ecosystem, incentivize excellence, and inspire both faculty and students to pursue knowledge that serves a greater purpose.

The Government of Bangladesh deeply values institutions like BRAC University that prioritize research-driven innovation and contribute to building a knowledge-based society. As we strive to elevate the standard of higher education across the nation, BRAC University stands as a model of how academic excellence and social responsibility can go hand in hand.

I extend my sincere congratulations to the recipients of this prestigious award. Your contributions are a source of national pride and global relevance. I also express my appreciation to the leadership and community of BRAC University for their continued efforts in advancing education, fostering innovation, and upholding the spirit of service to humanity.

Professor Dr. Md. Saidur Rahman
Member
University Grants Commission of Bangladesh (UGC)



Message from the Chairperson, Board of Trustees, BRAC University



I would like to extend my heartfelt congratulations to all the recipients of the Quality Journal Publications Award. This recognition celebrates your unwavering commitment to producing impactful knowledge that truly makes a difference in the world.

At BRAC University, we view the pursuit of knowledge as a powerful tool for shaping future leaders. Our mission is to nurture individuals who excel academically and possess the ability to apply their learning to real-world challenges. We aim to cultivate leaders who are guided by empathy, grounded in strong ethical values, and committed to driving positive societal change.

Our research efforts are focused on addressing some of the most pressing issues of our time — from public health and climate change to social injustice and beyond. It is with this vision in mind that we introduce our new strategic vision, “Reimagining Excellence.” This is not merely a slogan, but a promise — a commitment to weaving collaboration, critical thinking, creativity, and social responsibility into the core of our institution. By integrating cutting-edge research with a liberal arts approach, we are empowering our students to explore bold ideas while instilling in them the empathy to apply these insights for the greater good.

We are shaping a new generation of leaders who blend academic rigor with managerial skills, ethics, empathy, and a profound sense of responsibility. Together, they will create solutions that address the most pressing challenges facing society and the environment.

Once again, congratulations to all the recipients of the Quality Journal Publications Award. Your achievements inspire us and set a new benchmark for academic and research excellence at BRAC University. I am deeply grateful to everyone who has been part of this extraordinary journey.

Tamara Hasan Abed
Chairperson
Board of Trustees
BRAC University



Message from the Special Guest



It is truly an honour to be part of this momentous occasion at BRAC University. Over the years, BRAC University has rightfully earned its place as a distinguished institution—one that upholds the highest standards of academic excellence, research innovation, and social responsibility.

The establishment of the Quality Journal Publications Award marks a significant step in recognizing and encouraging high-impact research. This initiative is not only a celebration of individual achievement but also a testament to the university's commitment to fostering a research culture that is both globally relevant and locally responsive.

I am deeply impressed by how BRAC University continues to embody the vision of its founder, Sir Fazle Hasan Abed—using education as a transformative force for equity, progress, and human development. From addressing pressing global challenges to nurturing the next generation of changemakers, the university stands as a model for institutions across the Global South.

I congratulate all the award recipients for their outstanding contributions and wish them further success in their quest for academic & research excellence. I commend the university leadership for championing initiatives that elevate the research landscape of our country and wish them further success in their quest for academic and research excellence. Your collective efforts inspire great optimism for the future of higher education in Bangladesh.

Professor Mustafizur Rahman
Member, Board of Trustees, BRAC University
Distinguished Fellow, Centre for Policy Dialogue (CPD)
Former Professor, University of Dhaka



Message from the Vice-Chancellor BRAC University



It brings me immense pleasure to share a significant milestone in our academic journey—the introduction of the Quality Journal Publications Award at BRAC University. This achievement not only celebrates the exceptional contributions of our faculty but also reaffirms our commitment to academic excellence and impactful research.

At BRAC University, our pursuit of knowledge is deeply rooted in a broader mission of serving humanity. Inspired by the visionary leadership and enduring philosophy of our founder, Sir Fazle Hasan Abed, we are driven by a purpose greater than ourselves: to harness education and research as catalysts for transformative change. Sir Fazle believed in the power of education to uplift communities and dismantle cycles of poverty. At BRAC University, we strive to bring his vision to life by cultivating a culture of innovation, critical inquiry, and social responsibility.

Our research efforts aim to confront some of the most pressing challenges of our time—public health, climate change, social injustice, and beyond. The Quality Journal Publications Award is a reflection of this purpose, recognizing faculty whose work contributes meaningfully to the global body of knowledge while addressing real-world problems.

By incentivizing high-quality publications and strengthening research infrastructure, we continue to foster an environment where both faculty and students can thrive intellectually and lead with purpose.

As we move forward, we remain committed to shaping a future defined by academic distinction, meaningful societal contributions, and the holistic development of individuals. Through our distinct knowledge focusing on development and human prosperity, we aim to establish BRAC University as a model for research-driven progress across the Global South.

Congratulations to all the recipients of the Quality Journal Publications Award. Your achievements inspire us and set a benchmark for academic and research excellence at BRAC University. Let us, together, continue to strengthen the BRAC-BRACU synergy to build a better society. Thank you to everyone who has been part of this remarkable journey.

Professor Syed Ferhat Anwar
Vice-Chancellor
BRAC University



Message from the Chair Research Metrics Committee BRAC University

I am pleased to extend warm greetings on behalf of the Research Metrics Committee. We remain steadfast in our commitment to fostering academic excellence and advancing research at BRAC University.

It is with great pleasure that I congratulate the recipients of our *Quality Journal Publications Award*. Established in January 2023, this award program was designed to nurture a vibrant research culture at the university by recognizing and incentivizing publications in prestigious Q1 journals—publications that represent the highest level of research impact in their respective fields.

This initiative aligns with one of BRAC University's strategic pillars: the pursuit of excellence through research, especially by addressing social and economic challenges and generating solutions for Bangladesh and beyond. Our focus on Q1 journals reflects our commitment to maintaining the highest standards of scholarly credibility and academic rigor.

A key feature of this program is the introduction of financial incentives aimed at inspiring and motivating our academic and research staff. The selection process, diligently managed by the Research Metrics Committee, includes careful shortlisting, document verification, and comprehensive evaluation. Through this rigorous process, we ensure that recognition and support go to research that embodies academic excellence and directly contributes to the university's mission of addressing real-world challenges.

Through this initiative, we strive to elevate the university's research profile by upholding transparency, offering honorary incentives, and supporting the diverse aspirations of our faculty and researchers. Our collective efforts are contributing to the advancement of BRAC University and to broader societal progress.

Thank you for your unwavering dedication to research excellence. Together, we are building a strong academic community grounded in innovation, integrity, and impact.

Professor A.K.M. Abdul Malek Azad, PhD
Chair, Research Metrics Committee (RMC)
BRAC University

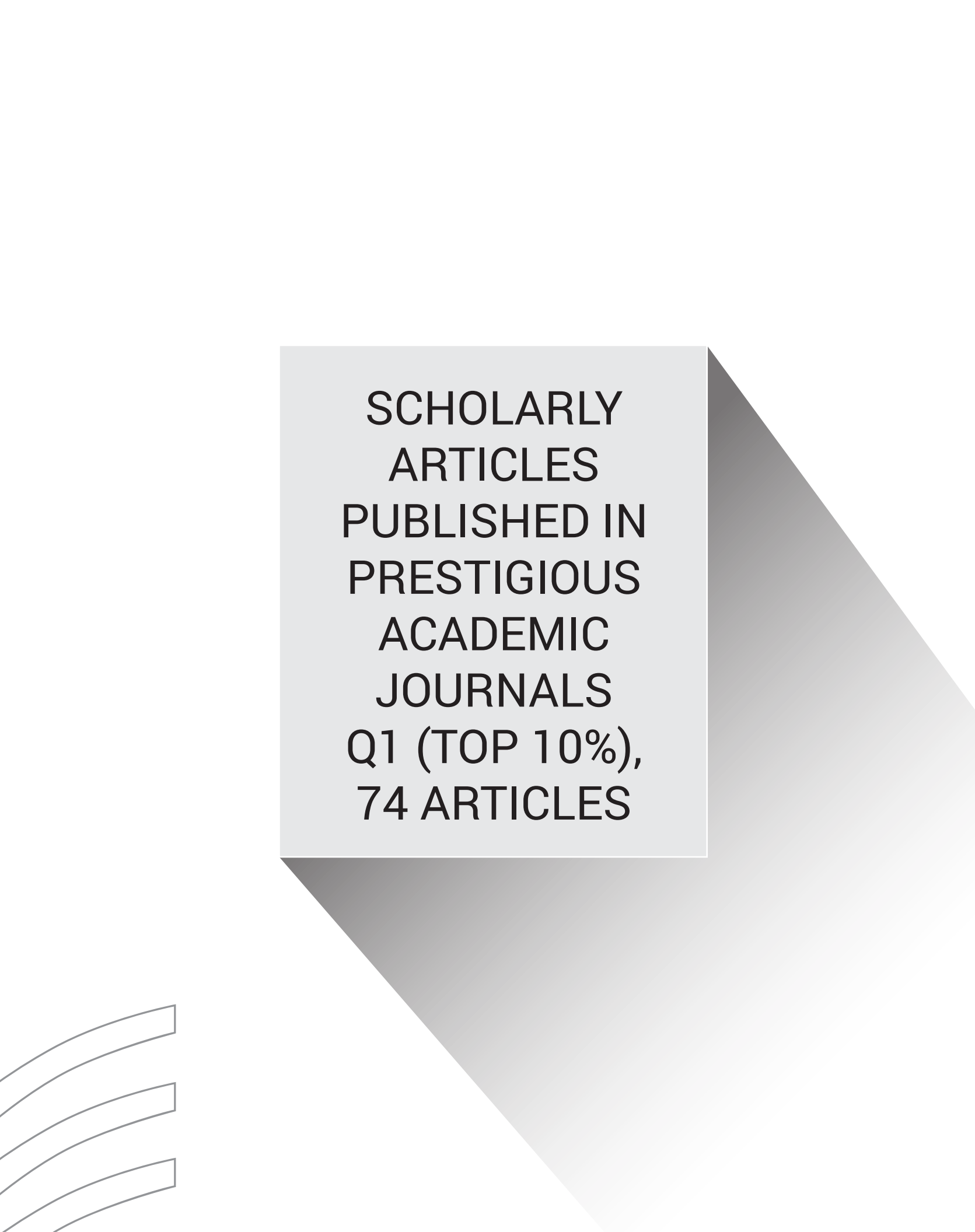
ABOUT RMC AWARD

BRAC University's commitment to academic excellence and research advancement is exemplified through its "Rewarding Quality Journal Publications" initiative, a response to the Government of Bangladesh's encouragement for research initiatives. Among the four quartiles of journals i.e. Q1, Q2, Q3, and Q4, the top 25% of journals are designated as Q1 (Quartile 1). The prestige of Q1 journals is attributed to their wide recognition and significant impact on research. Hence, the objective for this award is to motivate the academic and research staff at BRAC University to contribute to the top-tier Q1 journals, representing the pinnacle of research impact in each field. The emphasis on Q1 journals underscores the University's dedication to maintaining high standards and credibility in research output.

To inspire researchers, the initiative introduces financial incentives, offering 100,000 BDT for articles published in the top 10% journals and 50,000 BDT for the rest of the Q1 publications. To be eligible, at least one author needs to be affiliated with BRAC University, and the topic researched will need to align with the University's research priorities. The program, initiated in January 2023, operates under the supervision of the Research Metrics Committee (RMC) which ensures fairness and integrity in the evaluation process.

The selection process is meticulous, involving shortlisting, document verification, and evaluation by the RMC. This process ensures that funds are directed towards publications aligning with the University's research objectives, fostering a purposeful and impactful research culture.

The "Rewarding Quality Journal Publications" initiative by BRAC University is a comprehensive approach to elevate the institution's research profile. By recognizing excellence in research through this award, the University is actively fostering a thriving research environment for the benefit of its academic and research community which ultimately contributes to the individual as well as the institution's success.



SCHOLARLY
ARTICLES
PUBLISHED IN
PRESTIGIOUS
ACADEMIC
JOURNALS
Q1 (TOP 10%),
74 ARTICLES

Title of the Article: 1

An advanced data fabric architecture leveraging homomorphic encryption and federated learning

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Abstract

Data fabric is an automated and AI-driven data fusion approach to accomplish data management unification without moving data to a centralized location for solving complex data problems. In a Federated learning architecture, the global model is trained based on the learned parameters of several local models that eliminate the necessity of moving data to a centralized repository for machine learning. This paper introduces a secure approach for medical image analysis using federated learning and partially homomorphic encryption within a distributed data fabric architecture. With this method, multiple users or clients (hospitals/medical data centers) can collaborate in training a machine-learning model without exchanging raw data. The approach complies with laws and regulations such as HIPAA and GDPR, ensuring the privacy and security of the data. The study demonstrates the method's effectiveness through a case study on pituitary tumor classification, achieving a significant accuracy of 83.31%. However, the primary focus of the study is using the data fabric architecture to securely store and analyze medical images while complying with HIPAA and GDPR regulations. The results highlight the potential of these techniques to be applied to other privacy-sensitive domains and contribute to the growing body of research on secure and privacy-preserving machine learning.

Keywords: Data Fabric, Federated Learning, Partially Homomorphic, Encryption, Data Fusion, Data Lake

Citation: Rieyan, S. A., News, M. R. K., Rahman, A. M., Khan, S. A., Zaarif, S. T. J., Alam, M. G. R., ... & Fortino, G. (2024). An advanced data fabric architecture leveraging homomorphic encryption and federated learning. *Information Fusion*, 102, 102004. <https://doi.org/10.1016/j.inffus.2023.102004>

Funding Information: The authors are also grateful to King Saud University, Riyadh, Saudi Arabia for funding this work through Researchers Supporting Project Number (RSP2023R18). In addition, we acknowledge the support of the PNRR project FAIR - Future AI Research (PE00000013), Spoke 9 - Green-aware AI, under the NRRP MUR program funded by the NextGenerationEU.

Title of the Article: 2

Ideologies of teachers and students towards meso-level English-medium instruction policy and translanguaging in the STEM classroom at a Malaysian university

Authors and Affiliations:

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Abstract

English medium instruction (EMI) as a language policy in higher education is based on monolingual conceptions and limits the use of the full linguistic repertoire of bilinguals/multilinguals in the university classroom. Informed by the constructs of language ideology (Spolsky, Bernard. 2009. *Language management*. Cambridge, UK: Cambridge University Press), translanguaging (Li, Wei. 2018. *Translanguaging as a practical theory of language*. *Applied Linguistics* 39(1). 9–30) and pedagogical translanguaging (Creese, Angela & Adrian Blackledge. 2010. *Translanguaging in the bilingual classroom: A pedagogy for learning and teaching?* *The Modern Language Journal* 94(1). 103–115), this case study aimed to examine the ideologies held by micro-level stakeholders (i.e., teachers and students) towards institutional English-only EMI policy, translanguaging, and the significance and scope of pedagogical translanguaging in EMI classrooms. Semi-structured interviews were conducted with six teachers and 10 students at a public research university in Malaysia. Also collected were a variety of publicly accessible institutional documents, including the focal university's programme brochures, promotional materials and policy statements on its website. Analyses of the interviews and documents revealed that although EMI was officially adopted in the programmes, both teachers and students advocated for translanguaging and underscored its important role in the transmission of new information, effective communication, and scientific meaning-making. In light of these findings, the study concludes that an inclusive language policy is required that allows teachers and students to access all their linguistic resources.

Keywords: language ideology; English-medium instruction; translanguaging; translingual practices; higher education; Malaysia

Citation: Rahman, M. M., Islam, M. S., Karim, A., Singh, M. K. M., & Hu, G. (2024). Ideologies of teachers and students towards meso-level English-medium instruction policy and translanguaging in the STEM classroom at a Malaysian university. *Applied Linguistics Review*. DOI: <https://doi.org/10.1515/applirev-2023-0040>

Title of the Article: 3

A polarization independent highly sensitive metasurface-based biosensor for lab-on-chip applications

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Abstract

Metasurface-based sensors have emerged as an innovative technology in biosensing, offering enhanced sensitivity and versatility across a wide range of applications. In this study, we have proposed an asymmetric double T-shaped metasurface-based novel lab-on-chip and polarization-independent biosensor. Utilizing plasmonic metasurfaces for enhanced light-biomolecule interaction through near-field confinement effects, they enable streamlined processes, repeatability and reliability. Unlike surface plasmon resonance (SPR) sensors, metasurface-based sensors provide a comprehensive evaluation of plasmon parameters, significantly enhancing their analytical capabilities, which demonstrate exceptional stability, ensuring consistent and reliable results over time. The recorded sensitivity of the sensor is 1289.8 nm/RIU with a resolution of 7.753×10^{-7} RIU, which is capable of detecting minuscule changes in the refractive index of biomarkers. Our proposed novel sensor offers chemically stable and oxidization-free biosensing while ensuring rapid and selective diagnosis.

Keywords: Metasurface, Lab-on-chip, Polarization-independent, Biosensor, Sensitivity

Citation: Rahad, R., Haque, M. A., Mahadi, M. K., Faruque, M. O., Afrid, S. M. T. S., Mohsin, A. S., ... & Sagor, R. H. (2024). A polarization independent highly sensitive metasurface-based biosensor for lab-on-chip applications. *Measurement*, 231, 114652. <https://doi.org/10.1016/j.measurement.2024.114652>

Title of the Article: 4

Semantic Segmentation on Panoramic Dental X-Ray Images Using U-Net Architectures

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Abstract

The field of medical image analysis is in a constant state of evolution, particularly in the challenging tasks of segmenting organs, diseases, and abnormalities. Therefore, in the realm of dental disease diagnosis, image segmentation plays a crucial role in addressing the difficulties faced by dentists worldwide when diagnosing dental diseases with the naked eye. One prominent deep neural network architecture, known as U-Net, originally designed for biomedical image segmentation, has seen multiple variations and advancements aimed at improving its performance. However, the lack of comparative studies has made it challenging to assess the effectiveness of these U-Net variants in segmenting dental X-ray images. The primary objective of this research is to conduct a comprehensive performance comparison among various U-Net architectures for dental image segmentation. Specifically, we examine six U-Net architecture variants: Vanilla U-Net, Dense U-Net, Attention U-Net, SE U-Net, Residual U-Net, and R2 U-Net. These variants employ configurations with two and three convolutional layers in both the encoder and decoder blocks. Our evaluation metrics include Accuracy, Dice coefficient, F1 score, and IoU (Intersection over Union). Among these U-Net variants, Vanilla U-Net, with two convolutional layers, demonstrated the highest level of performance, achieving an Accuracy of 95.56% and an IoU score of 88% on the validation set. Notably, this model also exhibited a shorter processing time compared to the other architectures. Conversely, when employing three convolutional layers, the Dense U-Net variant emerged as the top performer, achieving an Accuracy of 95.94% and an IoU score of 89.07% on the validation set. Furthermore, the segmentation process successfully isolates the teeth from the surrounding structures, which holds

promise for improving disease detection through the development of automated disease diagnosis models.

Keywords: Dental, semantic segmentation, data annotation, OPG image, U-Net, U-Net variants, dice, coefficient, IoU, architecture comparison.

Citation: Zannah, R., Bashar, M., Mushfiq, R. B., Chakrabarty, A., Hossain, S., & Jung, Y. J. (2024). Semantic segmentation on panoramic x-ray images using u-net architectures. *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2024.3380027>

Title of the Article: 5

What About the Indigenous Languages of the Plains?: The Case of Kurukh in Bangladesh

Authors and Affiliations:

Asifa Sultana
Brac University

Abstract

More than 30 indigenous linguistic communities live in Bangladesh. Many of these languages are at risk of endangerment as the speakers see the functionality of their mother tongues diminish gradually. The purpose of the study is to examine the linguistic scenario of Kurukh, one of the indigenous languages spoken in the north-western parts of Bangladesh, with references to some of the essential concepts in relation to language shift and vitality. The author conducted a sociolinguistic survey with five groups of adult community members and four school-going children. Four notable community members were separately interviewed on a semi-structured questionnaire. The data were thematically analysed to understand the factors at play in shaping the status of Kurukh in Bangladesh. In a context of language endangerment, the study has significant implications for the policymakers as well as the community members as it provides insights into the language dynamics and the community aspirations.

Keywords: Language policy; language endangerment; language revitalization; indigenous language; mother tongue-based education

Citation: Sultana, A. (2024). What About the Indigenous Languages of the Plains?: The Case of Kurukh in Bangladesh. *Journal of Language, Identity & Education*, 1-17. DOI: <https://doi.org/10.1080/15348458.2024.2372019>

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Title of the Article: 6

LRFS: Online Shoppers' Behavior-based Efficient Customer Segmentation Model

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Abstract

In the realm of digital commerce, online shopping has witnessed unprecedented growth globally, becoming a cornerstone of modern consumer behavior. This research introduces an advanced customer segmentation model, named LRFS, which builds upon the traditional LRF framework (Length of Relationship, Recency of Purchase, and Frequency of Purchase), specifically tailored for the e-commerce sector. The innovation of the LRFS model lies in the integration of a novel component, “S”, which quantifies the Staying Rate relative to the revenue generated by customers on a specific website. This addition aims to enhance the granularity and efficacy of customer segmentation by leveraging data extracted from Google Analytics. To operationalize the LRFS model, this study employs two renowned clustering algorithms, K-Means and K-Medoids, analyzing the dataset through the lens of three distinct dimensionality reduction techniques: PCA (Principal Component Analysis), t-SNE (t-Distributed Stochastic Neighbor Embedding), and Autoencoder. This methodological approach facilitates a robust comparative analysis between the LRFS model and its predecessors — LR, LF, and LRF — utilizing K-Means clustering to evaluate the precision of customer cluster assignments. The empirical findings of this research underscore the superiority of the LRFS model in achieving more accurate and insightful customer segmentation. Additionally, a composite Customer Classification and Customer Relationship Matrix was deployed to discern the nuanced traits of clustered groups, identifying the fusion of K-Medoids and t-SNE as the most effective strategy for capturing the full spectrum of customer dynamics. The research further elucidates several test cases and use case scenarios, demonstrating the practical applications of the LRFS model in conjunction with K-Means and PCA to refine marketing strategies and foster a deeper understanding of the online customer base. Through the development and application of the LRFS model, this study contributes significantly to the field of e-commerce by providing a more nuanced tool for businesses to tailor their marketing initiatives, ensuring alignment with the evolving preferences and behaviors of their online clientele.

Keywords: Customer segmentation, unsupervised machine learning, K-means, K-medoids, RFM analysis, LRFM analysis, dimensionality reduction, PCA, t-SNE, autoencoder, deep learning, Google analytics.

Citation: Khan, R. H., Dofadar, D. F., Alam, M. G. R., Siraj, M., Hassan, M. R., & Hassan, M. M. (2024). LRFS: Online Shoppers’ Behavior-based Efficient Customer Segmentation Model. *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2024.3420221>

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Title of the Article: 7

Bangladesh

Authors and Affiliations:

Compiled and introduced by

Mafruha Mohua and Mahruba T. Mowtushi

London University and BRAC University, Bangladesh

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Title of the Article: 8

High Prevalence of Multidrug-Resistant Bacteria in the Trachea of Intensive Care Units Admitted Patients:
Evidence from a Bangladeshi Hospital

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Abstract

Recent research has shown that antibiotic-resistant microorganisms are becoming more prevalent in intensive care units (ICUs) at an exponential rate. Patients in the ICU can get infected by pathogens due to invasive operation procedures and critical health conditions. This study primarily emphasized tracheal samples from ICU patients due to their reliance on ventilators, increasing their susceptibility to Ventilator-Associated Pneumonia (VAP). Moreover, the rise of multidrug-resistant (MDR) pathogens makes treatment strategies more challenging for these patients. In this study, we tested 200 tracheal specimens to determine the prevalence of microorganisms and analyzed the antibiotic susceptibility of these isolates against regular antibiotics, including 4th generation drugs. Among the 273 isolates, 81% were gram-negative bacteria, 10% were gram-positive bacteria, and 9% were fungi. The most prevalent gram-negative bacteria were *Acinetobacter* spp. (34%), *Klebsiella* spp. (22%), *Pseudomonas* spp. (14%), and *Escherichia coli* (9.2%). The most prevalent gram-positive bacteria were *Staphylococcus aureus* (5.9%), and the fungi were *Candida* spp. (7.3%). Among the most prevalent bacteria, except *Staphylococcus aureus* isolates, around 90% were resistant to multiple drugs, whereas 60% of *Acinetobacter* spp. and *Pseudomonas* spp. were extensively drug resistant. Sensitivity analysis against the gram-negative and gram-positive drug panel using a one-way ANOVA test followed by Tukey's post hoc test showed that in the in vitro assay, colistin was the most effective antibiotic against all gram-negative bacteria. In contrast, linezolid, vancomycin, and fusidic acid were most effective against all gram-positive bacteria. Regular monitoring of nosocomial infections and safe management of highly resistant bacteria can help prevent future pandemics.

Keywords: multidrug-resistant bacteria; ICU patient; effective antibiotic

Citation: Haque, S., Ahmed, A., Islam, N., & Haque, F. K. M. (2024). High prevalence of multidrug-resistant bacteria in the trachea of intensive care units admitted patients: evidence from a Bangladeshi Hospital. *Antibiotics*, 13(1), 62. DOI: <https://doi.org/10.3390/antibiotics13010062>

Title of the Article: 9

Foliar Glutamine Application Improves Grain Yield and Nutritional Quality of Field-Grown Maize (*Zea mays* L.)
Hybrid ZD958

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Abstract

Foliar fertilization is an important agricultural practice. The response of crop plants to foliar application of mineral nutrients such as nitrogen (N), phosphorus, and potassium has been well recognized. However, little is known about crop plants' response to the foliar spray of organic sources of nutrient, in particular, under field conditions. Here, we sprayed glutamine (Gln) at V6, V8, V12, R1 (silk), and R3 (dough) stages of maize hybrid ZD958 to investigate the physiological impacts on grain yield and nutritional quality under sufficient and low-N conditions for two consecutive years. Exogenous application of Gln (1.25 mM) significantly enhanced grain yield approximately by 20.0% under sufficient N and 38.0% under low N, as a combinatorial effect of increases in kernel number and kernel weight. The higher N concentrations in the ear and delaying leaf senescence favor the kernel setting and grain filling, preconditioning higher grain yield at harvest. Further, Gln spray resulted in higher nutritional quality kernels as indicated by higher concentrations of crude proteins, minerals, oil, unsaturated fatty acids (i.e., oleic, and linoleic acids), total carotenoids (i.e., β -carotene, lutein, zeaxanthin, antheraxanthin, and violaxanthin), and α -tocopherol, partially attributing to larger nutrient-rich embryos. Taken together, our findings revealed how Gln promotes maize production and an additional potential to improve grain yield and nutritional quality traits of maize and other closely related cereal crops.

Citation: Islam, M. M., Hassan, M. U., Ishfaq, M., Ripa, F. A., Nadeem, F., Ahmad, Z., ... & Li, X. (2024). Foliar glutamine application improves grain yield and nutritional quality of field-grown maize (*Zea mays* L.) Hybrid ZD958. *Journal of Plant Growth Regulation*, 43(2), 624-637. DOI: <https://doi.org/10.1007/s00344-023-11121-w>

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Title of the Article: 10

Genome-wide study of globally distributed respiratory syncytial virus (RSV) strains implicates diversification utilizing phylodynamics and mutational analysis

Authors and Affiliations:

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Abstract

Respiratory syncytial virus (RSV) is a common respiratory pathogen that causes mild cold-like symptoms and severe lower respiratory tract infections, causing hospitalizations in children, the elderly and immunocompromised individuals. Due to genetic variability, this virus causes life-threatening pneumonia and bronchiolitis in young infants. Thus, we examined 3600 whole genome sequences submitted to GISAID by 31 December 2022 to examine the genetic variability of RSV. While RSVA and RSVB coexist throughout RSV seasons, RSVA is more prevalent, fatal, and epidemic-prone in several countries, including the United States, the United Kingdom, Australia, and China. Additionally, the virus's attachment glycoprotein and fusion protein were highly mutated, with RSVA having higher Shannon entropy than RSVB. The genetic makeup of these viruses contributes significantly to their prevalence and epidemic potential. Several strain-specific SNPs co-occurred with specific haplotypes of RSVA and RSVB, followed by different haplotypes of the viruses. RSVA and RSVB have the highest linkage probability at loci T12844A/T3483C and G13959T/C2198T, respectively. The results indicate that specific haplotypes and SNPs may significantly affect their spread. Overall, this analysis presents a promising strategy for tracking the evolving epidemic situation and genetic variants of RSV, which could aid in developing effective control, prophylactic, and treatment strategies.

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Title of the Article: 11

A sustainable Bitcoin blockchain network through introducing dynamic block size adjustment using predictive analytics

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Abstract

Bitcoin is the largest cryptocurrency in the market, which uses blockchain technology to bring in features like decentralization, anonymity, and trust. However, it still struggles with broader adaptation due to long verification times and high transaction fees. As a result, it is lagging behind competitors. We need to provide faster confirmations to tackle these issues while ensuring stable earnings for the miners. However, it is challenging to increase the block sizes or decrease the average block creation time without affecting the stability and security of the network. To address this conundrum, firstly, an optimization problem is formulated where the objective is to increase the transaction count in every cycle. Based on that, a comprehensive learning framework is developed to solve the formulated problem

since the issue is intractable and hard to solve in polynomial time. The proposed learning framework includes (i) implementing a viable data-driven infrastructure with a machine learning (ML) root, (ii) training learning models with efficient generalization capability, and (iii) predicting the ideal block size in every block generation cycle. Our concept uses extreme gradient boost (XGB) as its core algorithm, which analyzes nine attributes associated with the Bitcoin network. These network-allied data points assist the model in creating an adaptive block size in the blockchain. XGB, trained using the last four years of real-world data, can predict block sizes with a 63.41% accuracy. The model ensures an all-around positive change in Bitcoin with a 12.29% increase in block size, a 13.45% increase in transaction fee (USD), and a 14.88% increase in transaction approval rate and transaction count, thus addressing the long wait time and broader adaption issue.

Keywords: Bitcoin, Transaction throughput, Sustainability, Machine learning, Blockchain

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Title of the Article: 12

ChurnNet: Deep Learning Enhanced Customer Churn Prediction in Telecommunication Industry

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Abstract

In the Telecommunication Industry (TCI) customer churn is a significant issue because the revenue of the service provider is highly dependent on the retention of existing customers. In this competitive market, it is essential for the service providers to figure out the concerns of their existing customers regarding their services as the cancellation of the services by the customers and switching to new service providers will not bring any good to the service provider. In the context of TCI, numerous research have been made to predict customer churn though, after the performance evaluation of these studies, it shows that there is enough room for progress. Therefore, in this study, we proposed a novel customer churn prediction architecture namely ChurnNet to predict customer churn in TCI. In our proposed ChurnNet, the 1D convolution layer is integrated with residual block, squeeze and excitation block, and spatial attention module to improve the performance. Residual block aids in solving the vanishing gradient problem. Squeeze and excitation block and spatial attention module enable the ChurnNet to understand the interdependency between and within the channels respectively. To evaluate the performance, the experiment is performed on 3 publicly available datasets. As the datasets have significant class imbalance issues, three data balancing techniques such as SMOTE, SMOTEEN, and SMOTETomek are performed. Along with 10-fold cross-validation and after going through the rigorous experiment it was found that ChurnNet performed better than the state-of-the-art and obtained 95.59%, 96.94%, and 97.52% accuracy on 3 benchmark datasets respectively.

Keywords: Squeeze and excitation, spatial attention, residual block, churn prediction, ChurnNet.

Citation: Saha, S., Saha, C., Haque, M. M., Alam, M. G. R., & Talukder, A. (2024). Churnnet: deep learning enhanced

customer churn prediction in telecommunication industry. *IEEE access*, 12, 4471-4484. DOI: <https://doi.org/10.1109/ACCESS.2024.3349950>

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Title of the Article: 13

Federated Deep Learning for Monkeypox Disease Detection on GAN-Augmented Dataset

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Abstract

After the coronavirus disease 2019 (COVID-19) outbreak, the viral infection known as monkeypox gained significant attention, and the World Health Organization (WHO) classified it as a global public health emergency. Given the similarities between monkeypox and other pox viruses, conventional classification methods encounter difficulties in accurately identifying the disease. Furthermore, sharing sensitive medical data gives rise to concerns about security and privacy. Integrating deep neural networks with federated learning (FL) presents a promising avenue for addressing the challenges of medical data categorization. In light of this, we propose an FL-based framework using deep learning models to classify monkeypox and other pox viruses securely. The proposed framework has three major components: (a) a cycle-consistent generative adversarial network to augment data samples for training; (b) deep learning-based models such as MobileNetV2, Vision Transformer (ViT), and ResNet50 for the classification; and (c) a flower-federated learning environment for security. The experiments are performed using publicly available datasets. In the experiments, the ViT-B32 model yields an impressive accuracy rate of 97.90%, emphasizing the robustness of the proposed framework and its potential for secure and accurate categorization of monkeypox disease.

Keywords: Cycle GAN, deep neural network, federated learning, WHO, convolution neural network, monkeypox detection, vision transformer, datasets, data analysis.

Citation Kundu, D., Rahman, M. M., Rahman, A., Das, D., Siddiqi, U. R., Alam, M. G. R., ... & Ali, Z. (2024). Federated deep learning for monkeypox disease detection on gan-augmented dataset. *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2024.3370838>

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Title of the Article: 14

Federated ensemble-learning for transport mode detection in vehicular edge network

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Abstract

Transport Mode Detection (TMD) has become a crucial part of Intelligent Transportation Systems (ITS) thanks to the recent advancements in Artificial Intelligence and the Internet of Things, which enable the collection and processing of a vast amount of information on how people move and behave over space and time. Since smartphones and smartwatches have enabled people to stay connected to the internet all the time, predicting a person's mode of transportation has become easier since live location data can be collected easily. Vehicular Edge Networks (VEN) connect all smart vehicular edge devices and global cloud servers collect those devices' sensory data to try to predict a person's commute route using Machine Learning models. However, since the data is shared globally, security can be compromised, causing a large section of the population to be unwilling to share their sensory data with global cloud servers. The current state-of-the-art methods have achieved high accuracy in identifying a person's transportation mode. Nevertheless, most of the approaches do not address the privacy issues of the user data as the methods use centralized training systems. There are also decentralized federated learning systems that address the privacy issues of user data by often sacrificing the performance of the models by training them on a vast amount of decentralized data. In this research, we propose a hybrid Federated Ensemble-Learning (FedEL) model to detect transportation modes in VEN, which improves federated strategies in terms of performance as well. XGBoost, Random Forest, and MLP are trained with data from each local client through an ensemble method. A prediction is then delivered based on a majority vote among the three models, and the most-voted class is considered. Based on extensive testing, the FedEL technique delivers a 95.10% accuracy rate for a first dataset (5-second window) and a 98.61% accuracy rate for another dataset (half-second window) on a TMD dataset available in the literature.

Keywords: Transport Mode Detection, Intelligent Transportation System, Vehicular Edge Network, Federated Learning, Distributed, Majority voting

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Human Behavior-Based Personalized Meal Recommendation and Menu Planning Social System

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Abstract

The traditional dietary recommendation systems are basically nutrition or health-aware where the human feelings on food are ignored. Human affects vary when it comes to food cravings, and not all foods are appealing in all moods. It takes a lot of effort to learn people's food preferences and make recommendations based on their affects and nutrition. A questionnaire-based and preference-aware meal recommendation system can be a solution. However, automated recognition of social affects on different foods and planning the menu considering nutritional demand and social affect has some significant benefits over the questionnaire-based and preference-aware meal recommendations. A patient with severe illness, a person in a coma, or patients with locked-in syndrome and amyotrophic lateral sclerosis (ALS) cannot express their meal preferences. Therefore, the proposed framework includes a social-affective computing module to recognize the affects of different meals where the person's affect is detected using electroencephalography (EEG) signals. EEG allows to capture the brain signals and analyze them to anticipate affective state toward a food. In this study, we have used a 14-channel wireless Emotiv Epoc+ to measure affectivity for different food items. A hierarchical ensemble method is applied to predict affectivity upon multiple feature extraction methods and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) is used to generate a food list based on the predicted affectivity. In addition to the meal recommendation, an automated menu planning approach is also proposed considering a person's energy intake requirement, affectivity, and nutritional values of the different menus. The bin-packing algorithm is used for the personalized menu planning of breakfast, lunch, dinner, and snacks. The experimental findings reveal that the suggested affective computing, meal recommendation, and menu planning algorithms perform well across a variety of assessment parameters.

Keywords: Electroencephalography (EEG), food recommendation, human behavior learning, human emotions, menu planning social system, Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS).

Citation: Islam, T., Joyita, A. R., Alam, M. G. R., Hassan, M. M., Hassan, M. R., & Gravina, R. (2022). Human behavior-based personalized meal recommendation and menu planning social system. *IEEE Transactions on Computational Social Systems*, 10(4), 2099-2110. DOI: <https://doi.org/10.1109/TCSS.2022.3213506>

Title of the Article: 16

Malicious Data Classification in Packet Data Network Through Hybrid Meta Deep Learning

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Abstract

Advancements in wireless network technology have provided a powerful tool to boost productivity and serve as a vital communication method that overcomes the limitations of wired networks. However, because of using wireless networks, security is an increasing concern in the community. At the time of our study, people rely on machine learning techniques to create a trustworthy networking system. However, it hinders the development of a reliable network as the number of publicly available malicious data is insufficient to train a model correctly. In real life, people are not very keen to share this data as they are sensitive. In order to deal with this issue, we primarily aim to develop a solution that provides a reliable intrusion detection system despite being trained with a small amount of data. This paper proposes a novel idea of hybrid meta deep learning in detecting malicious packet data. We use a combination of Siamese and Prototypical networks where the Siamese network is used for binary classification and the Prototypical network for multi-class classification. Both approaches are based on meta learning techniques, requiring a minimal amount of data for most attack classes. Utilizing these meta learning characteristics, we could train our model with just 3000 data samples and achieve more than 90% accuracy for both meta learning tactics. Our study aims to provide a secure and trustworthy network domain that enhances communication between end users.

Keywords: CSE-CIC-IDS2017, CSE-CIC-IDS2018, few-shot learning, hybrid meta learning, intrusion detection, malicious data classification, meta learning, multi-class classification, prototypical network, Siamese network.

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Title of the Article: 17

ROBB: Recurrent Proximal Policy Optimization Reinforcement Learning for Optimal Block Formation in Bitcoin Blockchain Network

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Abstract

Blockchain is a ground-breaking technology that has changed how we manage and store protected data. It is a decentralized ledger that enables safe, open, and unchangeable record-keeping. It relies on a distributed network of nodes rather than a single central authority to check and verify transactions, guaranteeing that each entry is correct and unchangeable. Transactions in a blockchain network are grouped into blocks, which are then linked together in a chronological and immutable chain. Block size is a critical parameter in blockchain technology, which refers to the maximum size of each block in the chain that is not benchmarked yet. However, we cannot just change the block size of the blockchain. It is challenging and will create security issues. The Block size is crucial because it affects the number of transactions processed per second, the confirmation time, and overall network efficiency. The confirmation time should be faster to ensure stable earnings for the miners. Moreover, it needs help with broader applications due to high transaction fees and long verification times. We have proposed a reinforcement learning model named ROBB that can efficiently create a block considering the current network state and previous transactions. At first, the problem was converted into a reinforcement learning environment to solve using multiple reinforcement algorithms. We developed a blockchain simulator to replicate the network environment. To transform it into a reinforcement learning environment, we integrated it with OpenAI Gym. The simulator was trained by generating random transactions. Finally, we designed a reward function that enables the simulator to hold transactions and create blocks with the pending transactions when it determines that the environment is favorable. In the final results, ROBB successfully minimized the waiting time for transactions and utilized the blocks to their full potential. Additionally, it optimized the block space, building upon the findings of previous researchers. From the research, we can see that our proposed models show impressive results with 100% block utilization and 1.8s average waiting time while creating the least number of blocks.

Keywords: Dynamic block size, reinforcement learning, blockchain, OpenAIGym, proximal policy optimization.

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Title of the Article: 18

Connectedness across meme assets and sectoral markets: Determinants and portfolio management

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Abstract

This study examines the dynamic connectedness and risk spillovers between meme coins, meme stocks, and sectoral markets under different investment horizons. Further, we explore the effects of global uncertainty and risk factors on patterns of dynamic connectedness as well as the benefits of portfolio diversification under different investment strategies. Empirical results indicate that the short-, medium-, and long-term connectedness among these markets are time-varying and are highly responsive to external shocks and stress periods, with the short-term spillover dominating both medium- and long-term spillovers. Furthermore, Meme stocks and coins are net receivers of shock, along with the energy, communication services, utilities, and real estate sectors, whereas other sectors are net transmitters. On the contrary, GameStop-GME becomes net shock transmitters in the medium and long run, while Shiba Inu is a net shock transmitter in the long run. We also show that Meme stocks and Meme coins have distinct features and characteristics from the sectoral markets. They are disconnected and minimally affected by the fluctuations in the sectoral market. Finally, empirical findings show that global risk factors reduce dynamic connectedness across time horizons. These results have several implications for investors, portfolio managers, and policymakers regarding investment strategies, asset allocation, and risk management.

Keywords: Meme stocks, Meme coins, Hedging strategies, Time-frequency spillover, Sectoral market

Citation: Elsayed, A. H., Hoque, M. E., Billah, M., & Alam, M. K. (2024). Connectedness across meme assets and sectoral markets: Determinants and portfolio management. *International Review of Financial Analysis*, 93, 103177. DOI: <https://doi.org/10.1016/j.irfa.2024.103177>

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Title of the Article: 19

Association of granulocyte macrophage colony-stimulating factor and interleukin-17 levels with obsessive–compulsive disorder: a case–control study findings

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Abstract

Obsessive–compulsive disorder (OCD) is a mental condition that affects many people and is characterized by recurring obsessions and compulsions. It significantly impacts individuals' ability to function ordinarily daily, affecting people of all ages. This study aimed to investigate whether or not the cytokines granulocyte macrophage colony-stimulating factor (GM-CSF) and interleukin-17 (IL-17) are involved in the pathophysiology of OCD. A case–control study with 50 OCD patients and 38 healthy volunteers served as the controls for this investigation. The levels of GM-CSF and IL-17 in the serum of both groups were measured with enzyme-linked immunosorbent assay (ELISA) kits. In addition, the sociodemographic characteristics of the population under study were studied. Based on the findings of this study, OCD patients had significantly elevated levels of IL-17 than the controls, it appears that there may be a function for IL-17 in the pathophysiology of OCD. It was also discovered that the severity of OCD and IL-17 levels had a significant positive correlation. On the other hand, when comparing the levels of GM-CSF, there was no significant difference between the patients and the controls. This study provides evidence supporting the involvement

of cytokine IL-17 in the pathophysiology of OCD. This study suggests IL-17 as a diagnostic biomarker for OCD and adds to our knowledge of the function that the immune system plays in this condition.

Citation: Sarker, R., Qusar, M. S., Islam, S. M. A., Bhuiyan, M. A., & Islam, M. R. (2023). Association of granulocyte macrophage colony-stimulating factor and interleukin-17 levels with obsessive-compulsive disorder: a case-control study findings. *Scientific Reports*, 13(1), 18976. DOI: <https://doi.org/10.1038/s41598-023-46401-8>

Title of the Article: 20

Burden of disease scenarios for 204 countries and territories, 2022-2050: a forecasting analysis for the Global Burden of Disease Study 2021

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Abstract

Background: Future trends in disease burden and drivers of health are of great interest to policy makers and the public at large. This information can be used for policy and long-term health investment, planning, and prioritisation. We have expanded and improved upon previous forecasts produced as part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) and provide a reference forecast (the most likely future), and alternative scenarios assessing disease burden trajectories if selected sets of risk factors were eliminated from current levels by 2050.

Methods: Using forecasts of major drivers of health such as the Socio-demographic Index (SDI; a composite measure of lag-distributed income per capita, mean years of education, and total fertility under 25 years of age) and the full set of risk factor exposures captured by GBD, we provide cause-specific forecasts of mortality, years of life lost (YLLs), years lived with disability (YLDs), and disability-adjusted life-years (DALYs) by age and sex from 2022 to 2050 for 204 countries and territories, 21 GBD regions, seven super-regions, and the world. All analyses were done at the cause-specific level so that only risk factors deemed causal by the GBD comparative risk assessment influenced future trajectories of mortality for each disease. Cause-specific mortality was modelled using mixed-effects models with SDI and time as the main covariates, and the combined impact of causal risk factors as an offset in the model. At the all-cause mortality level, we captured unexplained variation by modelling residuals with an autoregressive integrated moving average model with drift attenuation. These all-cause forecasts constrained the cause-specific forecasts at successively deeper levels of the GBD cause hierarchy using cascading mortality models, thus ensuring a robust estimate of cause-specific mortality. For non-fatal measures (eg, low back pain), incidence and prevalence were forecasted from mixed-effects models with SDI as the main covariate, and YLDs were computed from the resulting prevalence forecasts and average disability weights from GBD. Alternative future scenarios were constructed by replacing appropriate reference trajectories for risk factors with hypothetical trajectories of gradual elimination of risk factor exposure from current levels to 2050. The scenarios were constructed from various sets of risk factors: environmental risks (Safer Environment scenario), risks associated with communicable, maternal, neonatal, and nutritional diseases (CMNNs; Improved Childhood Nutrition and Vaccination scenario), risks associated with major non-communicable diseases (NCDs; Improved Behavioural and Metabolic Risks scenario), and the combined effects of these three scenarios. Using the Shared Socioeconomic Pathways climate scenarios SSP2-4.5 as reference and SSP1-1.9 as an optimistic alternative in the Safer Environment scenario, we accounted for climate change impact on health by using the most recent Intergovernmental Panel on Climate Change temperature forecasts and published trajectories of ambient air pollution for the same two scenarios. Life expectancy and healthy life expectancy were computed using standard methods. The forecasting framework includes computing the age-sex-specific future population for each location and separately for each scenario. 95% uncertainty intervals (UIs) for each individual future estimate were derived from the 2·5th and 97·5th percentiles of distributions generated from propagating 500 draws through the multistage computational pipeline.

Findings: In the reference scenario forecast, global and super-regional life expectancy increased from 2022 to 2050, but improvement was at a slower pace than in the three decades preceding the COVID-19 pandemic (beginning in 2020). Gains in future life expectancy were forecasted to be greatest in super-regions with comparatively low life expectancies (such as sub-Saharan Africa) compared with super-regions with higher life expectancies (such as the high-income super-region), leading to a trend towards convergence in life expectancy across locations between

now and 2050. At the super-region level, forecasted healthy life expectancy patterns were similar to those of life expectancies. Forecasts for the reference scenario found that health will improve in the coming decades, with all-cause age-standardised DALY rates decreasing in every GBD super-region. The total DALY burden measured in counts, however, will increase in every super-region, largely a function of population ageing and growth. We also forecasted that both DALY counts and age-standardised DALY rates will continue to shift from CMNNs to NCDs, with the most pronounced shifts occurring in sub-Saharan Africa (60·1% [95% UI 56·8–63·1] of DALYs were from CMNNs in 2022 compared with 35·8% [31·0–45·0] in 2050) and south Asia (31·7% [29·2–34·1] to 15·5% [13·7–17·5]). This shift is reflected in the leading global causes of DALYs, with the top four causes in 2050 being ischaemic heart disease, stroke, diabetes, and chronic obstructive pulmonary disease, compared with 2022, with ischaemic heart disease, neonatal disorders, stroke, and lower respiratory infections at the top. The global proportion of DALYs due to YLDs likewise increased from 33·8% (27·4–40·3) to 41·1% (33·9–48·1) from 2022 to 2050, demonstrating an important shift in overall disease burden towards morbidity and away from premature death. The largest shift of this kind was forecasted for sub-Saharan Africa, from 20·1% (15·6–25·3) of DALYs due to YLDs in 2022 to 35·6% (26·5–43·0) in 2050. In the assessment of alternative future scenarios, the combined effects of the scenarios (Safer Environment, Improved Childhood Nutrition and Vaccination, and Improved Behavioural and Metabolic Risks scenarios) demonstrated an important decrease in the global burden of DALYs in 2050 of 15·4% (13·5–17·5) compared with the reference scenario, with decreases across super-regions ranging from 10·4% (9·7–11·3) in the high-income super-region to 23·9% (20·7–27·3) in north Africa and the Middle East. The Safer Environment scenario had its largest decrease in sub-Saharan Africa (5·2% [3·5–6·8]), the Improved Behavioural and Metabolic Risks scenario in north Africa and the Middle East (23·2% [20·2–26·5]), and the Improved Nutrition and Vaccination scenario in sub-Saharan Africa (2·0% [–0·6 to 3·6]).

Interpretation: Globally, life expectancy and age-standardised disease burden were forecasted to improve between 2022 and 2050, with the majority of the burden continuing to shift from CMNNs to NCDs. That said, continued progress on reducing the CMNN disease burden will be dependent on maintaining investment in and policy emphasis on CMNN disease prevention and treatment. Mostly due to growth and ageing of populations, the number of deaths and DALYs due to all causes combined will generally increase. By constructing alternative future scenarios wherein certain risk exposures are eliminated by 2050, we have shown that opportunities exist to substantially improve health outcomes in the future through concerted efforts to prevent exposure to well established risk factors and to expand access to key health interventions.

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Combination of epigallocatechin 3 gallate and curcumin improves D-galactose and normal-aging associated memory impairment in mice

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Abstract

Previously, we observed curcumin improves aging-associated memory impairment in d-galactose (D-gal) and normal-aged (NA) mice. Evidence showed that multiple agents can be used in managing aging-induced memory dysfunction, drawn by the contribution of several pathways. Curcumin and Epigallocatechin 3 gallate (EGCG) combination substantially reduced the oxidative stress that commonly mediates aging. This study examined the combined effect of EGCG and curcumin on memory improvement in two recognized models, D-gal and normal-aged (NA) mice. The co-administration of EGCG and curcumin significantly ($p < 0.05$) increased retention time detected by passive avoidance (PA) and freezing response determined in contextual fear conditioning (CFC) compared to the discrete administration of EGCG or curcumin. Biochemical studies revealed that the combination of EGCG and curcumin remarkably ameliorated the levels ($p < 0.05$) of glutathione, superoxide dismutase, catalase, advanced oxidation protein products, nitric oxide, and lipid peroxidation compared to the monotherapy of EGCG or curcumin in mice hippocampi. The behavioral and biochemical studies revealed that the combination of EGCG and curcumin showed better improvement in rescuing aging-associated memory disorders in mice. EGCG and curcumin combination could serve as a better choice in managing aging-related memory disorders.

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Title of the Article: 22

Evaluation of serum interleukin-12 and interleukin-4 as potential biomarkers for the diagnosis of major depressive disorder

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Abstract

Recently, scientists have focused on pro-inflammatory cytokines and immunological dysregulation in major depressive disorder (MDD). Some research suggests pro-inflammatory cytokines' role in MDD development, whereas anti-inflammatory studies are sparse. There is no systematic investigation of Bangladeshi MDD patients' pro- and anti-inflammatory cytokines. This study examines the blood levels of IL-12 and IL-4 in Bangladeshi patients and healthy controls (HCs) to determine the diagnostic accuracy of these cytokines to identify MDD patients from those without MDD. A total of 110 people with MDD from the department of psychiatry of a teaching hospital in Dhaka and 107 HCs from Dhaka participated in this case-control study. Depression and illness severity were gauged using DSM-5 criteria and Ham-D scores. Commercially marketed ELISA kits were used in accordance with manufacturer guidelines to measure the levels of IL-12 and IL-4 in peripheral blood, allowing a comparison of the patient and control groups. In comparison to HCs, MDD patients (5333.00 ± 307.40 pg/ml) showed noticeably higher levels of

IL-12 than in HCs (2331.00 ± 207.40 pg/ml). The increased levels were positively correlated with Ham-D scores (male: $r=0.351$, $p<0.050$; female: $r=0.389$, $p<0.050$), suggesting a possible relationship to disease progression. Additionally, compared to HCs (272.81 ± 23.94 pg/ml), MDD patients had significantly higher peripheral blood levels of IL-4 (876.35 ± 66.73 pg/ml) ($p<0.001$). Also, there was a positive correlation between IL-4 serum levels and Ham-D scores (male: $r=0.361$, $p<0.050$; female: $r=0.398$, $p<0.050$). Therefore, we observed increased levels of these serum cytokines and their association with the severity of depression. The results of this study demonstrate the possibility of IL-12 and IL-4 blood levels as distinct markers capable of differentiating between MDD patients and HCs, possibly acting as markers of MDD susceptibility. To ascertain the diagnostic effectiveness of these two cytokines, more research is necessary.

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Title of the Article: 23

Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021.

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Abstract

Background: Understanding the health consequences associated with exposure to risk factors is necessary to inform public health policy and practice. To systematically quantify the contributions of risk factor exposures to specific health outcomes, the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021 aims to provide comprehensive estimates of exposure levels, relative health risks, and attributable burden of disease for 88 risk factors in 204 countries and territories and 811 subnational locations, from 1990 to 2021.

Methods: The GBD 2021 risk factor analysis used data from 54 561 total distinct sources to produce epidemiological estimates for 88 risk factors and their associated health outcomes for a total of 631 risk–outcome pairs. Pairs were included on the basis of data-driven determination of a risk–outcome association. Age–sex–location–year-specific estimates were generated at global, regional, and national levels. Our approach followed the comparative risk assessment framework predicated on a causal web of hierarchically organised, potentially combinative, modifiable risks. Relative risks (RRs) of a given outcome occurring as a function of risk factor exposure were estimated separately for each risk–outcome pair, and summary exposure values (SEVs), representing risk-weighted exposure prevalence, and theoretical minimum risk exposure levels (TMRELs) were estimated for each risk factor. These estimates were used to calculate the population attributable fraction (PAF; ie, the proportional change in health risk that would occur if exposure to a risk factor were reduced to the TMREL). The product of PAFs and disease burden associated with a given outcome, measured in disability-adjusted life-years (DALYs), yielded measures of attributable burden (ie, the proportion of total disease burden attributable to a particular risk factor or combination of risk factors). Adjustments for mediation were applied to account for relationships involving risk factors that act indirectly on outcomes via intermediate risks. Attributable burden estimates were stratified by Socio-demographic Index (SDI) quintile and

presented as counts, age-standardised rates, and rankings. To complement estimates of RR and attributable burden, newly developed burden of proof risk function (BPRF) methods were applied to yield supplementary, conservative interpretations of risk–outcome associations based on the consistency of underlying evidence, accounting for unexplained heterogeneity between input data from different studies. Estimates reported represent the mean value across 500 draws from the estimate’s distribution, with 95% uncertainty intervals (UIs) calculated as the 2·5th and 97·5th percentile values across the draws.

Findings: Among the specific risk factors analysed for this study, particulate matter air pollution was the leading contributor to the global disease burden in 2021, contributing 8·0% (95% UI 6·7–9·4) of total DALYs, followed by high systolic blood pressure (SBP; 7·8% [6·4–9·2]), smoking (5·7% [4·7–6·8]), low birthweight and short gestation (5·6% [4·8–6·3]), and high fasting plasma glucose (FPG; 5·4% [4·8–6·0]). For younger demographics (ie, those aged 0–4 years and 5–14 years), risks such as low birthweight and short gestation and unsafe water, sanitation, and handwashing (WaSH) were among the leading risk factors, while for older age groups, metabolic risks such as high SBP, high body-mass index (BMI), high FPG, and high LDL cholesterol had a greater impact. From 2000 to 2021, there was an observable shift in global health challenges, marked by a decline in the number of all-age DALYs broadly attributable to behavioural risks (decrease of 20·7% [13·9–27·7]) and environmental and occupational risks (decrease of 22·0% [15·5–28·8]), coupled with a 49·4% (42·3–56·9) increase in DALYs attributable to metabolic risks, all reflecting ageing populations and changing lifestyles on a global scale. Age-standardised global DALY rates attributable to high BMI and high FPG rose considerably (15·7% [9·9–21·7] for high BMI and 7·9% [3·3–12·9] for high FPG) over this period, with exposure to these risks increasing annually at rates of 1·8% (1·6–1·9) for high BMI and 1·3% (1·1–1·5) for high FPG. By contrast, the global risk-attributable burden and exposure to many other risk factors declined, notably for risks such as child growth failure and unsafe water source, with age-standardised attributable DALYs decreasing by 71·5% (64·4–78·8) for child growth failure and 66·3% (60·2–72·0) for unsafe water source. We separated risk factors into three groups according to trajectory over time: those with a decreasing attributable burden, due largely to declining risk exposure (eg, diet high in trans-fat and household air pollution) but also to proportionally smaller child and youth populations (eg, child and maternal malnutrition); those for which the burden increased moderately in spite of declining risk exposure, due largely to population ageing (eg, smoking); and those for which the burden increased considerably due to both increasing risk exposure and population ageing (eg, ambient particulate matter air pollution, high BMI, high FPG, and high SBP).

Interpretation: Substantial progress has been made in reducing the global disease burden attributable to a range of risk factors, particularly those related to maternal and child health, WaSH, and household air pollution. Maintaining efforts to minimise the impact of these risk factors, especially in low SDI locations, is necessary to sustain progress. Successes in moderating the smoking-related burden by reducing risk exposure highlight the need to advance policies that reduce exposure to other leading risk factors such as ambient particulate matter air pollution and high SBP. Troubling increases in high FPG, high BMI, and other risk factors related to obesity and metabolic syndrome indicate an urgent need to identify and implement interventions.

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Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021.

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Abstract

Background: Detailed, comprehensive, and timely reporting on population health by underlying causes of disability and premature death is crucial to understanding and responding to complex patterns of disease and injury burden over time and across age groups, sexes, and locations. The availability of disease burden estimates can promote evidence-based interventions that enable public health researchers, policy makers, and other professionals to implement strategies that can mitigate diseases. It can also facilitate more rigorous monitoring of progress towards national and international health targets, such as the Sustainable Development Goals. For three decades, the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) has filled that need. A global network of collaborators contributed to the production of GBD 2021 by providing, reviewing, and analysing all available data. GBD estimates are updated routinely with additional data and refined analytical methods. GBD 2021 presents, for the first time, estimates of health loss due to the COVID-19 pandemic.

Methods: The GBD 2021 disease and injury burden analysis estimated years lived with disability (YLDs), years of life lost (YLLs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries using 100 983 data sources. Data were extracted from vital registration systems, verbal autopsies, censuses, household surveys, disease-specific registries, health service contact data, and other sources. YLDs were calculated by multiplying cause-age-sex-location-year-specific prevalence of sequelae by their respective disability weights, for each disease and injury. YLLs were calculated by multiplying cause-age-sex-location-year-specific deaths by the standard life expectancy at the age that death occurred. DALYs were calculated by summing YLDs and YLLs. HALE

estimates were produced using YLDs per capita and age-specific mortality rates by location, age, sex, year, and cause. 95% uncertainty intervals (UIs) were generated for all final estimates as the 2·5th and 97·5th percentiles values of 500 draws. Uncertainty was propagated at each step of the estimation process. Counts and age-standardised rates were calculated globally, for seven super-regions, 21 regions, 204 countries and territories (including 21 countries with subnational locations), and 811 subnational locations, from 1990 to 2021. Here we report data for 2010 to 2021 to highlight trends in disease burden over the past decade and through the first 2 years of the COVID-19 pandemic.

Findings: Global DALYs increased from 2·63 billion (95% UI 2·44–2·85) in 2010 to 2·88 billion (2·64–3·15) in 2021 for all causes combined. Much of this increase in the number of DALYs was due to population growth and ageing, as indicated by a decrease in global age-standardised all-cause DALY rates of 14·2% (95% UI 10·7–17·3) between 2010 and 2019. Notably, however, this decrease in rates reversed during the first 2 years of the COVID-19 pandemic, with increases in global age-standardised all-cause DALY rates since 2019 of 4·1% (1·8–6·3) in 2020 and 7·2% (4·7–10·0) in 2021. In 2021, COVID-19 was the leading cause of DALYs globally (212·0 million [198·0–234·5] DALYs), followed by ischaemic heart disease (188·3 million [176·7–198·3]), neonatal disorders (186·3 million [162·3–214·9]), and stroke (160·4 million [148·0–171·7]). However, notable health gains were seen among other leading communicable, maternal, neonatal, and nutritional (CMNN) diseases. Globally between 2010 and 2021, the age-standardised DALY rates for HIV/AIDS decreased by 47·8% (43·3–51·7) and for diarrhoeal diseases decreased by 47·0% (39·9–52·9). Non-communicable diseases contributed 1·73 billion (95% UI 1·54–1·94) DALYs in 2021, with a decrease in age-standardised DALY rates since 2010 of 6·4% (95% UI 3·5–9·5). Between 2010 and 2021, among the 25 leading Level 3 causes, age-standardised DALY rates increased most substantially for anxiety disorders (16·7% [14·0–19·8]), depressive disorders (16·4% [11·9–21·3]), and diabetes (14·0% [10·0–17·4]). Age-standardised DALY rates due to injuries decreased globally by 24·0% (20·7–27·2) between 2010 and 2021, although improvements were not uniform across locations, ages, and sexes. Globally, HALE at birth improved slightly, from 61·3 years (58·6–63·6) in 2010 to 62·2 years (59·4–64·7) in 2021. However, despite this overall increase, HALE decreased by 2·2% (1·6–2·9) between 2019 and 2021.

Interpretation: Putting the COVID-19 pandemic in the context of a mutually exclusive and collectively exhaustive list of causes of health loss is crucial to understanding its impact and ensuring that health funding and policy address needs at both local and global levels through cost-effective and evidence-based interventions. A global epidemiological transition remains underway. Our findings suggest that prioritising non-communicable disease prevention and treatment policies, as well as strengthening health systems, continues to be crucially important. The progress on reducing the burden of CMNN diseases must not stall; although global trends are improving, the burden of CMNN diseases remains unacceptably high. Evidence-based interventions will help save the lives of young children and mothers and improve the overall health and economic conditions of societies across the world. Governments and multilateral organisations should prioritise pandemic preparedness planning alongside efforts to reduce the burden of diseases and injuries that will strain resources in the coming decades.

Citation: Ferrari, A. J., Santomauro, D. F., Aali, A., Abate, Y. H., Abbafati, C., Abbastabar, H., ... & Bell, M. L. (2024). Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*, 403(10440), 2133–2161. DOI: [https://doi.org/10.1016/S0140-6736\(24\)00757-8](https://doi.org/10.1016/S0140-6736(24)00757-8)

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Title of the Article: 25

The Impact of Chronic Diseases on Mental Health: An Overview and Recommendations for Care Programs

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Abstract

Purpose of Review: The current achievement of medical advancement is noteworthy; however, the occurrence of chronic diseases is increasing day by day, with a significant percentage of affected people are suffering from a mental health crisis. This article aims to present a thorough yet brief review of methods that can be employed to build the emotional wellness of chronic patients.

Recent Findings: The mental health care strategies include resilience-building, coping skills training, professional counseling, and lifestyle adaptations. Additionally, the article highlights the efficacy of several modern interventions, such as mindfulness-based therapies, cognitive behavioral therapy, eye movement desensitization, and recovery from stress therapy.

Summary: The global burden of chronic illness emphasizes the pressing need to mitigate mental health problems among chronic patients. By providing actionable insights, our study clears the path for targeted interventions and holistic approaches for chronic disease patients. Moreover, the article suggests to policymakers and clinicians the need for collaboration and multifaceted interventions.

Keywords: Chronic diseases, Mental health, Psychological stress, Support, Strategies, Mitigation

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Title of the Article: 26

Hospitality customer intentions to write fake online reviews: A cross-cultural approach

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Abstract

This paper examines the antecedents and consequences of customer intentions to write fake online reviews on Agoda.com as a case in the hospitality context. Brand nostalgia, brand strength, moral attitude, review-related skepticism, and perceived unfairness were represented as antecedents of customer intentions, while boycott behavior, willingness to pay a price premium, and customer satisfaction were represented as consequences of their intentions. Data was gathered using a structured survey from 373 Italian, 440 French, and 392 British customers. Findings present significant insights into customer intentions to write fake online reviews. In addition, multi-group analysis highlights the differences among nationalities. This paper provides valuable insights for industry professionals and policymakers in the hospitality industry.

Keywords: Agoda, Fake reviews, Online reviews, Value creation, Value destruction

Citation: Zaman, M., Tan, C. C., Islam, M. S., & Selem, K. M. (2024). Hospitality customer intentions to write fake online reviews: a cross-cultural approach. *International Journal of Hospitality Management*, 120, 103775. DOI: <https://doi.org/10.1016/j.ijhm.2024.103775>

Title of the Article: 27

A multi-level random key cryptosystem based on DNA encoding and state-changing mealy machine

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Abstract

Cryptography allows our data to be transmitted without giving sensitive information away. This is the art of hiding the information from the malicious third party and making the data accessible to only the sender and the receiver. Building a complex cryptosystem has always been a challenge that can provide relentless security and is infeasible to break. This paper discusses a hybrid cryptosystem that is inspired by the concepts of DNA cryptography and it is further strengthened using multiple components. A random key is used which is generated using the run test of randomness, different DNA encoding combinations, and a state-changing random state mealy machine is used for further strengthening the security. This paper provides a detailed discussion regarding every component the authors used to build the system and also discusses about the vulnerabilities that they found in the existing works with also an overview on how they have addressed them. This paper also discusses the effectiveness and the performance of the proposed system to give an overview of its security measures and also provides some comparative analysis with existing works to back the claim on improved security features.

Keywords: Cryptography, DNA cryptography, Key generation, Mealy machine, DNA encoding, State-changing mealy machine

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Title of the Article: 28

Demystifying Machine Learning Models of Massive IoT Attack Detection with Explainable AI for Sustainable and Secure Future Smart Cities

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Abstract

Smart cities rely heavily on Internet of Things (IoT) technology, which enables automation services through interconnected IoT devices. However, the widespread use of IoT applications in smart cities has resulted in security and privacy concerns that must be addressed to protect sensitive data. To safeguard smart cities from cyber attacks, learning theory-based automated attack-detection methods must be adopted. Various techniques have been proposed in the literature to create effective models for identifying IoT attacks. However, the majority of IoT detection algorithms have focused on only a few types of IoT attacks, and most IoT threat detection systems have used black-box deep learning models that lack interpretability to support their forecasts. This research aims to detect several types of large-scale attacks on IoT devices using the Extreme Gradient Boosting (XG-Boost) classifier and Explainable Artificial Intelligence (XAI) approaches. The proposed method not only improves the model's performance but also increases trust in the model. The results of the experimental study on the IOTD20 dataset and XAI evaluation of each feature's contribution to the model demonstrate that the proposed model can efficiently identify malicious attacks and threats, reducing IoT cybersecurity threats in smart cities.

Keywords: Future smart city, Future internet and network, AI in network, XG-BOOST, Explainable AI, LIME, SHAP, ELI5, IoT attack

Citation: Muna, R. K., Hossain, M. I., Alam, M. G. R., Hassan, M. M., Ianni, M., & Fortino, G. (2023). Demystifying machine learning models of massive IoT attack detection with Explainable AI for sustainable and secure future smart cities. *Internet of Things*, 24, 100919. DOI: <https://doi.org/10.1016/j.iot.2023.100919>

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Title of the Article: 29

Machine Learning-Based Opinion Spam Detection: A Systematic Literature Review

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Abstract

The substantial upsurge in Web 2.0 deployment allows a large number of consumers to share their opinions with potential consumers and producers through product and service review platforms. Customer decision-making relies on an important aspect of review: spam-free opinions. Unfortunately, fraudulent activities produced spam reviews that misled potential buyers and traders. Subsequently, it does stop opinion-mining techniques from reaching accurate

conclusions. This study aims to identify and review existing state-of-the-art methodologies for three groups: 1) spam reviews; 2) individual spammers; and 3) group spam. The machine learning (ML) and deep learning (DL) techniques for spam detection are categorized, and we establish an assessment that may be deemed appropriate in the field. The findings reveal a total of 10 metrics, with accuracy being the most often used (25%) concerning ML-based techniques in spam detection. Followed by recall in 24% of studies, and precision in 22% of studies. In addition, the F-measure, the area under the curve (AUC), and F1-score evaluation metrics reveal that the use of the Amazon dataset as a whole increased by 7%. This study concludes that the majority of SMS spam filtering strategies are leading solutions. In addition, the taxonomy of existing state-of-the-art methodologies is developed, and it is concluded that a substantial number of studies utilize these existing SMS anti-spam applications. This research uncovered previously unexplored areas of ML and DL's application to spam review and provided a new paradigm for applying these technologies to the issue. The findings provide both academics and practitioners with a deeper understanding of the barriers to spam review identification, as well as potential improvement opportunities using ML techniques. These individuals will now have the chance to consider a benchmark for future research.

Keywords: Group spam, machine learning, opinion mining, opinion spam detection, spammer detection

Citation: Qazi, A., Hasan, N., Mao, R., Abo, M. E. M., Dey, S. K., & Hardaker, G. (2024). Machine Learning-Based Opinion Spam Detection: A Systematic Literature Review. *IEEE Access*. <https://doi.org/10.1109/ACCESS.2024.3399264>

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Title of the Article: 30

FinTech solutions for sustainable agricultural value chains: A perspective from smallholder farmers

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Abstract

Smallholder farmers in developing nations face multifaceted challenges as they strive to secure fair prices for their agricultural products. With a primary focus on bolstering sustainable agricultural value chains (SAVC), this conceptual paper investigates the transformative potential of Financial Technology (FinTech) solutions. The study synthesizes insights from prior research on SAVC, hurdles faced by smallholder farmers, conventional strategies, and the untapped prospects offered by FinTech solutions in the agricultural sector. Utilizing the PRISMA strategy for comprehensive documentation retrieval, the study underscores the significance of creating a robust SAVC to empower smallholder farmers within the broader value chain landscape. It is found that Agri-FinTech solutions represent a pivotal avenue for advancing living standards and cultivating agricultural sustainability in developing nations. The integration of FinTech solutions for agri-credit mechanisms and product market facilitation catalyzes enabling pre-production financing and ensures fair prices for smallholder farmers in the post-production phase while neutralizing the value chain's exploitation potential. The study advocates for the expeditious adoption of information technology in developing countries, spotlighting the transformative role of Mobile Financial Services (MFS), which fortifies the agriculture sector, ensuring its resilience and responsiveness to the evolving demands of a globalized market. Drawing upon an evaluation of existing literature on FinTech-enhanced agricultural initiatives in developing nations, the study outlines directions for future research and creates a path for a more nuanced understanding of the strategic enhancements necessary to fortify the SAVC, fostering a sustainable and equitable ecosystem for smallholder farmers.

Keywords: agri-credit mechanism, agricultural value chain financing, FinTech, mobile financial services, smallholder farmers, sustainable agricultural value chains

Citation: Rayhan, M. J., Rahman, S. M., Mamun, A. A., Saif, A. N. M., Islam, K. A., Alom, M. M., & Hafiz, N. (2024). FinTech solutions for sustainable agricultural value chains: A perspective from smallholder farmers. *Business Strategy & Development*, 7(2), e358. DOI: <https://doi.org/10.1002/bsd2.358>

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Title of the Article: 31

Navigating the nexus: unraveling technological innovation, economic growth, trade openness, ICT, and CO2 emissions through symmetric and asymmetric analysis

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Abstract

In Malaysia's rapid economic growth and industrialization, environmental degradation and carbon emissions pose significant challenges. As urbanization continues to rise, there is a growing recognition of the imperative to tackle CO₂ emissions. Trade openness and globalization drive economic activity but also heighten environmental pressures, including CO₂ emissions from transportation and industry. Information communication technology (ICT) usage, shaped by infrastructure and regulations, can either improve energy efficiency or increase energy consumption. The study examines the impacts of economic growth (EG), trade openness (TON), technological innovation (TIN), and ICT on CO₂ emissions in Malaysia, using both symmetric and asymmetric methods from 1985 to 2021. While many studies have explored environmental degradation, focusing on CO₂ emissions and ecological footprint indicators, only a limited number have delved into the combined impact of sustainable EG, TON, ICT, and TIN on Malaysia's CO₂ emissions. Notably, these studies have often neglected the utilization of both symmetric and asymmetric methodologies. Hence, this study employed auto-regressive distributed lag (ARDL) and non-linear ARDL approaches to investigate the dynamic effects of the studied variables. The key findings from the symmetric analysis demonstrate that EG, TON, and ICT together take part in the increase of CO₂ emissions in both the short and long run. Particularly, technological innovation plays a significant role in reducing CO₂ emissions in the short term through the adoption of cleaner technologies. However, the results of the NARDL bound test reveal asymmetric long-term consequences of technological innovation, economic growth, and ICT on CO₂ emissions. The study underscores the need for CO₂ reduction policies in Malaysia, advocating for measures, such as incentivizing cleaner technologies and upgrading energy infrastructure. It also recommends implementing carbon pricing mechanisms for production and trade, alongside awareness campaigns to foster behavioral changes aimed at reducing emissions.

Citation: Junsheng, H., Mu, Y., Masud, M. M., Akhtar, R., Saif, A. N. M., Islam, K. M., & Hafiz, N. (2024). Navigating the nexus: unraveling technological innovation, economic growth, trade openness, ICT, and CO₂ emissions through symmetric and asymmetric analysis. *Humanities and Social Sciences Communications*, 11(1), 1-13. DOI: <https://doi.org/10.1057/s41599-024-03092-4>

Title of the Article: 32

Exploring the Impact of Device System Quality on Mobile Shopping Adoption among University Students: Symmetrical and Asymmetrical Approaches

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Abstract

Mobile shopping (m-shopping) adoption has been significantly touted in the contemporary era; however, the adoption of m-shopping is still under shadow in many developing countries. The aim of this study is to discover the impact of device system quality on m-shopping adoption among university students with the support of UTAUT and UTAUT2 theories. The study employed PLS-SEM (symmetric) and fsQCA (asymmetric) analysis simultaneously using survey data from 530 respondents who are primarily university students. PLS-SEM results found positive significant relation between device system quality and m-shopping adoption. The study contributes with an extension of earlier studies that combine PLS-SEM (symmetric methods) and fsQCA (asymmetric methods). The study is limited among the university students that may affect the generalizability of the study. The casual recipes in this research aid policymakers

to achieve their strategic objectives in implementing positive m-shopping behavior among the university students.

Keywords: mobile shopping adoption, device system quality, university students, PLS-SEM, fsQCA

Citation: Emmanuel, C. P., Qin, S., Hossain, S. F. A., & Rashed, M. (2024). Exploring the Impact of Device System Quality on Mobile Shopping Adoption among University Students: Symmetrical and Asymmetrical Approaches. *SAGE Open*, 14(2), 21582440241248325. DOI: <https://doi.org/10.1177/21582440241248325>

Title of the Article: 33

Evaluating the security of CAPTCHAs utilized on Bangladeshi websites

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Abstract

A number of attacks such as spamming, email-address harvesting, dictionary attacks, brute-force attacks, credential surfing attacks, DOS attacks and others can be executed relatively easily if the target system cannot differentiate between requests coming from a real human user and those generated artificially by bots. In order to distinguish between human users and bots, the Completely Automatic Public Turing Test (CAPTCHA) has been used for almost 20 years. Nevertheless, CAPTCHA can be easily broken if it lacks security features. Consequently, the motivation for utilizing CAPTCHA is undermined. This article proposes a framework that can evaluate the security aspects of text CAPTCHAs. The effectiveness of the framework is validated by using a generalized attack method consisting of pre-processing and utilizing an Optical Character Recognition (OCR) library such as Tesseract OCR. We have carried out a systematic study of existing CAPTCHAs utilized on Bangladeshi websites. We have studied 238 Bangladeshi websites and found that only 44 websites used a CAPTCHA mechanism. Then, we have assessed the security levels of the selected text CAPTCHAs by the proposed framework. As per our analysis, we have found that there are 29 different CAPTCHA schemes being adopted on Bangladeshi websites and among them 23 are vulnerable to automated attacks. In order to address these issues, we also present a number of recommendations.

Keywords: CAPTCHA, CAPTCHA attack, Security evaluation framework, Automated bot attack OCR, Bangladeshi websites

Citation: Shibbir, M. N. I., Rahman, H., Ferdous, M. S., & Chowdhury, F. (2024). Evaluating the security of CAPTCHAs utilized on Bangladeshi websites. *Computers & Security*, 140, 103774. DOI: <https://doi.org/10.1016/j.cose.2024.103774>

Title of the Article: 34

Biodegradation of polyethylene and polystyrene by *Zophobas atratus* larvae from Bangladeshi source and isolation of two plastic-degrading gut bacteria

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Abstract

Plastic pollution has become a major environmental concern globally, and novel and eco-friendly approaches like bioremediation are essential to mitigate the impact. Low-density polyethylene (LDPE), linear low-density polyethylene (LLDPE), and expanded polystyrene (EPS) are three of the most frequently used plastic types. This study examined biodegradation of these using *Zophobas atratus* larvae, followed by isolation and whole genome sequencing of gut bacteria collected from larvae frass. Over 36 days, 24.04 % LDPE, 20.01 % EPS, and 15.12 % LLDPE were consumed on average by the larvae, with survival rates of 85 %, 90 %, and 87 %, respectively. Fourier transform infrared spectroscopy (FTIR) analysis of fresh plastic types, consumed plastics, and larvae frass showed proof of plastic oxidation in the gut. Frass bacteria were isolated and cultured in minimal salt media supplemented with plastics as the sole carbon source. Two isolates of bacteria were sampled from these cultures, designated PDB-1 and PDB-2. PDB-1 could survive on LDPE and LLDPE as carbon sources, whereas PDB-2 could survive on EPS. Scanning Electron Microscopy (SEM) provided proof of degradation in both cases. Both isolates were identified as strains of *Pseudomonas aeruginosa*, followed by sequencing, assembly, and annotation of their genomes. LDPE- and LLDPE-degrading enzymes e.g., P450 monooxygenase, alkane monooxygenase, alcohol dehydrogenase, etc. were identified in PDB-1. Similarly, phenylacetaldehyde dehydrogenase and other enzymes involved in EPS degradation were identified in PDB-2. Genes of both isolates were compared with genomes of known plastic-degrading *P. aeruginosa* strains. Virulence factors, antibiotic-resistance genes, and rhamnolipid biosurfactant biosynthesis genes were also identified in both isolates. This study indicated *Zophobas atratus* larvae as potential LDPE, LLDPE, and EPS biodegradation agent. Additionally, the isolated strains of *Pseudomonas aeruginosa* provide a more direct and eco-friendly solution for plastic degradation. Confirmation and modification of the plastic-degrading pathways in the bacteria may create scope for metabolic engineering in the future.

Keywords: *Zophobas atratus*, Linear low-density polyethylene, Low-density polyethylene, Expanded polystyrene, Biodegradation, *Pseudomonas aeruginosa*

Citation: Zaman, I., Turjya, R. R., Shakil, M. S., Al Shahariar, M., Emu, M. R. R. H., Ahmed, A., & Hossain, M. M. (2024). Biodegradation of polyethylene and polystyrene by *Zophobas atratus* larvae from Bangladeshi source and isolation of two plastic-degrading gut bacteria. *Environmental Pollution*, 345, 123446. DOI: <https://doi.org/10.1016/j.envpol.2024.123446>

Title of the Article: 35

External intervention and responsive adaptation by the community: Experiences of improving house quality in an urban slum

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Abstract

Non-governmental organizations (NGOs), governmental organizations, or other entities may run their projects as external interventions within a community to reduce disaster risks and adapt to future climatic events. These external interventions may influence the community to take further adaptation measures for enhancing community resilience. The spontaneous adaptation process, referring as responsive adaptation, needs to be identified and acknowledged. This research aims to investigate the impacts of external interventions on the responsive adaptation process by studying a riverside flood-prone urban slum in Bangladesh. This settlement experienced a site development project, primarily run by an NGO, that allowed several modifications to the built environment, mainly targeting flood risks. Selected tools of participatory rural appraisal (PRA) or participatory urban appraisal (PUA) methods were employed to obtain data about the community's initiatives for further development. The results show that the site development project, especially its impacts on reducing flood risks, has influenced community members to invest in improving the condition of their individual houses. As a means of responsive adaptation, the conscious developments of their houses contribute to enhancing the resilience level. Through exploring the community's initiatives, this research identifies that the engagement of communities with their knowledge and investments can extend the success of the external intervention.

Keywords: community resilience, external intervention, flood, NGO, responsive adaptation, urban slum

Citation: Chowdhoree, I., & Islam, I. (2024). External intervention and responsive adaptation by the community: Experiences of improving house quality in an urban slum. *Journal of Flood Risk Management*, 17(4), e13013. DOI: <https://doi.org/10.1111/jfr3.13013>

Title of the Article: 36

Dense neural network based arrhythmia classification on low-cost and low-compute micro-controller

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Abstract

The electrocardiogram (ECG) monitoring device is an expensive albeit essential device for the treatment and diagnosis of cardiovascular diseases (CVD). The cost of this device typically ranges from \$2000 to \$10000. Several studies have implemented ECG monitoring systems in micro-controller units (MCU) to reduce industrial development costs by up to 20 times. However, to match industry-grade systems and display heartbeats effectively, it is essential to develop an efficient algorithm for detecting arrhythmia (irregular heartbeat). Hence in this study, a dense neural network to detect arrhythmia on the Arduino Nano is developed. The Nano consists of the ATmega328 microcontroller with a 16 MHz clock, 2 KB of SRAM, and 32 KB of program memory. Additionally, the AD8232 SparkFun Single-Lead Heart Rate Monitor is used as the ECG sensor. The implemented neural network model consists of two layers (excluding the input) with 10 and four neurons respectively with sigmoid activation function. However, four approaches are explored to choose the appropriate activation functions. The model has a size of 1.267 KB, achieves an F1 score (macro-average) of 78.3% for classifying four types of arrhythmia, an accuracy rate of 96.38%, and requires 0.001314 MOps of floating-point operations (FLOPs). It significantly outperformed recent studies in terms of neural network metrics and compute resource usage efficiency.

Keywords: Electrocardiogram, Arrhythmia, Low-cost, Low-compute, Low-power, Machine learning, Embedded system, Micro-controller

Citation: Zishan, M. A. O., Shihab, H. M., Islam, S. S., Riya, M. A., Rahman, G. M., & Noor, J. (2024). Dense neural network based arrhythmia classification on low-cost and low-compute micro-controller. *Expert Systems with Applications*, 239, 122560. DOI: <https://doi.org/10.1016/j.eswa.2023.122560>

Title of the Article: 37

Leveraging a Smartwatch for Activity Recognition in Salat

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Abstract

Salat, the most important worship of Muslims and the second pillar of Islam, is an integral part of the Muslim community. Being a complex activity, Salat involves a series of steady and transitional activities to be performed in a specific sequence. On top of that, Salat has variations based on time, priority, school of thought, etc., making activity recognition in Salat more challenging. Existing research studies related to recognizing individual activities in Salat either demand capturing images by a camera or carrying a smartphone (sometimes in inconvenient places) while praying. Both of the demands are not convenient or applicable in real cases. Besides, the existing studies lack user-independent accuracy analysis and fine-grained prediction. To address these gaps, in this study, we first assess the requirement and acceptability of technological solutions for activity recognition in Salat by conducting an exploratory study. Upon establishing the requirement, we propose an activity recognition methodology using a smartwatch to recognize different activities in Salat. We prepare a Salat activity dataset using a smartwatch and propose a new methodology using semantic rules and Dynamic Time Warping (DTW) that achieves a near-perfect accuracy (99.3%) in recognizing activities in Salat. Besides, our proposed methodology offers fine-grained recognition of the individual activities in Salat and is robust enough to overlook the extra transitional activities a person performs while praying, which does not nullify Salat. Therefore, this research is expected to lead to a comprehensive solution for monitoring Salat.

Keywords: Complex activity recognition, DTW, Salat, smartwatch

Citation: Jahan, I., Al-Nabhan, N. A., Noor, J., Rahaman, M., & Al Islam, A. A. (2023). Leveraging a smartwatch for activity recognition in Salat. *IEEE Access*, 11, 97284-97317. DOI: <https://doi.org/10.1109/ACCESS.2023.3311261>

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Title of the Article: 38

RemOrphan: Object Storage Sustainability Through Removing Offline-Processed Orphan Garbage Data

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Abstract

Nowadays, extremely large amounts of structured and unstructured types of data are stored in public, private, and hybrid cloud storage using object storage systems. Among these, storing multimedia data such as image, video, and audio pose unique challenges and long-term effects on object storage Sustainability. Three such challenges are smoother and more efficient video streaming, middleware placement for media processing, and lastly, management of orphan garbage data. In order to tackle these challenges, this paper presents a generalized architecture for smooth and efficient management as well as retrieval of multimedia data in cloud systems. To do so, first, we propose a new middleware package in the object server for supporting smooth video streaming and on-demand playable video segments. Here, we demonstrate that video segment download time improves by up to 30% when segmentation is done in the object server rather than in the proxy server. After, we focus on how to find orphan garbage data on media cloud storage and to what extent they can hamper data retrieval. Specifically, we present a generalized architecture named ‘RemOrphan’ for detecting the orphan garbage data using OpenStack Swift hash Ring and scripts. We deploy a private media cloud SPMS and find that around 35% data can be orphan garbage data. Due to the huge amount of orphan data, rsync replication needs higher time and more network overhead which hampers the system’s sustainability. We lower around 25% sync delay and 30% network overhead after deploying a deletion daemon to remove the orphan garbage data.

Keywords: Object storage system (OSS), offline video processing, middleware, garbage collector, video segmenter, orphan garbage data.

Citation: Noor, J., Al-Nabhan, N. A., & Al Islam, A. A. (2023). RemOrphan: Object storage sustainability through removing offline-processed orphan garbage data. *IEEE Access*, 11, 107049-107067. DOI: <https://doi.org/10.1109/ACCESS.2023.3319217>

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Title of the Article: 39

Secure Processing-aware Media Storage and Archival (SPMSA)

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Abstract

The demand for a robust as well as a highly-available surveillance system with efficient media sharing capability has considerably risen in recent times. In this regard, CCTV offers a well-accepted pervasive solution all over the globe. Here, individuals and industries generally face challenges in storing CCTV video footage in their local machines. Besides, an alternative solution of long-time archiving of large-size video footage in the cloud is also challenging due to the associated steep rise in requirements of bandwidth, computing, and storage requirements. To face these challenges, in this paper, we propose a new methodology to utilize OpenStack Swift's object storage to efficiently store and archive media data. Our method leverages expanding the cloud file-sharing capabilities from storing media files to processing and archiving them along with performing encryption. Our proposed approach first segments encodes, and transcodes the videos according to several resolutions for covering diversified remote devices. Then, we store the processed video footage in the storage server of OpenStack Swift. Afterward, we perform necessary media encryption-decryption, compress the files containing the video data, and archive them using an archive server. We perform all these tasks in our proposed architectural model by developing several new middleware services in OpenStack Swift. As a whole, we build a new storage system architecture where we can efficiently as well as securely store and share large video surveillance data, and later we can find and retrieve that data even after a few years. We carry out rigorous experiments over a real setup comprising machines deployed in two different countries (Canada and Bangladesh), located over two different continents, to validate the efficacy and efficiency of our proposed architecture and methodology. Experimental results demonstrate substantial performance improvement using our approach over conventional alternative solutions.

Keywords: Media Cloud, OpenStack Swift, PJPEG, Middleware, Image Resizing, Encryption, Video Surveillance System, Fault Tolerance

Citation: Noor, J., Ratul, R. H., Basher, M. S., Soumik, J. A., Sadman, S., Rozario, N. J., ... & Al Islam, A. A. (2024). Secure processing-aware media storage and archival (spmsa). *Future Generation Computer Systems*, 159, 290-306. DOI: <https://doi.org/10.1016/j.future.2024.05.010>

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Title of the Article: 40

Sherlock in OSS: A Novel Approach of Content-Based Searching in Object Storage System

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Abstract

Cloud-based Object Storage Systems (OSS) are known for their scalability, durability, availability, and concurrency. However, there is a noticeable vacuum in open-source OSS for a straightforward way for users and administrators to conduct data searches within object storage without fully utilizing the cloud infrastructure. In our research, we present Sherlock, a novel Content-Based Searching (CoBS) framework. Sherlock enhances search capabilities by using extra information from images and documents, incorporating this information into an Elasticsearch-powered database to enable content-driven searches. The framework operates through a two-stage process. First, it classifies the incoming data by type, directing images to an object detection model and processing documents for keyword extraction. Then, Elasticsearch catalogs the extracted data, facilitating searches based on content. The effectiveness of our searches is largely dependent on the precision of these models, which we improve by training them on large-scale datasets: the Microsoft COCO Dataset for multimedia content and the SemEval2017 Dataset for text documents. We further test our system's performance by integrating it with the open-source OSS, OpenStack Swift, and conducting real-world experiments with image uploads to evaluate how our model performs within Swift's object storage environments.

Keywords: Content-based searching (CoBS), content-based image retrieval (CBIR), deep learning, OpenStack Swift, object storage system (OSS), distributed systems.

Citation: Noor, J., Sakif, M. S. I., Mondal, J. J., Uday, M. R. A., Ratul, R. H., Chellappan, S., & Al Islam, A. A. (2024). Sherlock in OSS: A novel approach of content-based searching in object storage system. *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2024.3401074>

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Title of the Article: 41

Emergence of a novel sublineage, MYMBD21 under SA-2018 lineage of Foot-and-Mouth Disease Virus serotype O in Bangladesh

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Abstract

Foot-and-Mouth Disease (FMD) hinders the growth of the livestock industry in endemic countries like Bangladesh. The management and prevention of FMD are severely impacted by the high mutation rate and subsequent frequent

generation of newer genotypes of the causative agent, Foot-and-Mouth Disease Virus (FMDV). The current study was conducted in nine districts of Bangladesh during 2019–21 to characterize the circulating FMDV strains based on the VP1 sequence analysis, the major antigenic recognition site providing serotype specificity and high variability of FMDV. This study detected the first emergence of the SA-2018 lineage in Bangladesh along with the predominance of Ind-2001e (or Ind-2001BD1) sublineage of ME-SA topotype under serotype O during 2019–21. The mutational spectrum, evolutionary divergence analysis and multidimensional plotting confirmed the isolates collected from Mymensingh districts, designated as MYMBD21 as a novel sublineage under the SA-2018 lineage. Analysis of the amino acid sequence revealed several changes in the G-H loop, B-C loop and C-terminal region of VP1, revealing a 12–13% divergence from the existing vaccine strains and a 95% VP1 protein homology, with most of the mutations potentially considerable as vaccine escape mutations, evidenced by three-dimensional structural analysis. This is the first report on the emergence of the SA-2018 lineage of ME-SA topotype of FMDV serotype O in Bangladesh, as well as a possible mutational trend towards the emergence of a distinct sublineage under SA-2018 lineage, which calls for in-depth genome-wide analysis and monitoring of the FMD situation in the country to implement a strategic vaccination and effective FMD control program.

Citation: Hossain, K. A., Anjume, H., Alam, K. M., Yeamin, A., Akter, S., Hossain, M. A., & Sultana, M. (2023). Emergence of a novel sublineage, MYMBD21 under SA-2018 lineage of foot-and-mouth disease virus serotype O in Bangladesh. *Scientific Reports*, 13(1), 9817. DOI: <https://doi.org/10.1038/s41598-023-36830-w>

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Title of the Article: 42

Epidemiological Surveillance and Mutational Pattern Analysis of Foot-and-Mouth Disease Outbreaks in Bangladesh during 2012–2021

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Abstract

Foot-and-mouth disease (FMD) in cloven-hoofed animals is considered an economically devastating disease in endemic countries like Bangladesh, where the livestock sector contributes to a greater portion of the nation's economy. The causative agent of the disease, foot-and-mouth disease virus (FMDV), equipped with higher mutational frequency challenges the efficacy of the existing vaccine and control measures. This study, including 32 districts and 71 outbreaks to reveal epidemiological patterns and mutational trends of FMDV over the past 10 years (2012–2021), reported a 54.7% prevalence of FMD, with the majority of outbreaks occurring during the rainy season. Different risk factors such as age, gender, farming system, and vaccination status demonstrated a significant association with FMD cases which was confirmed by the χ^2 test ($p < 0.05$). VP1 sequence analyses reported the predominance of serotype

O (85%) over serotype A (11%) and serotype Asia 1 (4%). Bangladesh has foreseen the emergence of several novel FMDV strains during this decade. Novel sublineages, Ind-2001BD1 (Ind-2001e) and Ind-2001BD2, were reported under serotype O, the G-IX lineage of serotype Asia 1 emerged in 2018, and most recently in 2021, a new genotype named MYMBD21 under the lineage SA-2018 was detected for the first time in Bangladesh. Until now, Ind-2001e (Ind-2001BD1) sublineage under serotype O became the predominant sublineage in Bangladesh. From the mutational trend analysis, highly variable sites were observed at positions 138 and 140 within the G-H loop for serotype O. For serotype A and Asia 1, 45th and 44th residues within the B-C loop showed the highest amino acid variations, respectively. A changing mutational pattern among the 2019–2021 FMDV O and A isolates was also observed. The findings of the study would be crucial to understand the FMD situation and designing necessary preventive steps according to the progressive control pathway for FMD control in Bangladesh.

Citation: Hossain, K. A., Anjume, H., Akther, M., Alam, K. M., Yeamin, A., Akter, S., ... & Hossain, M. A. (2023). Epidemiological Surveillance and Mutational Pattern Analysis of Foot-and-Mouth Disease Outbreaks in Bangladesh during 2012–2021. *Transboundary and emerging diseases*, 2023(1), 8896572. DOI: <https://doi.org/10.1155/2023/8896572>

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Title of the Article: 43

Information and Behavior: Evidence from Fertilizer Quantity Recommendations in Bangladesh

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Abstract

We use a field experiment in Bangladesh to test if two types of variety-specific fertilizer recommendations – government provided, community-level recommendations and plot-specific recommendations based on individual soil tests – affect fertilizer use, yield, and profits. The treatments have a limited effect on quantity of most fertilizer types used by farmers. One exception is the case of TSP (phosphate fertilizer), which is recommended for all varieties but recommended quantities are significantly lower than the baseline average usage. A minority of treatment farmers over-react to the recommendations by stopping TSP use after the intervention. In the soil-testing treatment arm farmers also shift their seed choice to varieties for which their baseline fertilizer consumption aligns with the recommendation. Opting out of using TSP, an essential fertilizer, ultimately hurts productivity as farmers in the community-based recommendation arm experience a 4% yield reduction.

Citation: Beg, S., Islam, M., & Rahman, K. W. (2024). Information and behavior: Evidence from fertilizer quantity recommendations in Bangladesh. *Journal of Development Economics*, 166, 103195. DOI: <https://doi.org/10.1016/j.jdevco.2023.103195>

Title of the Article: 44

A Taxonomy of Challenges for Self-Sovereign Identity Systems

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Abstract

Creating and utilizing digital identities are fundamental steps towards accessing online services. In order to facilitate the management of user identities, the concept of identity management has been introduced. Various systems and protocols have been developed to manage online identities. However, these systems are provider-centric, focusing on aiding providers in managing their user bases. As a result, users often have limited control over their identity data and remain unaware of how centralized identity providers use or potentially misuse their data. Self-Sovereign Identity (SSI) has emerged as a new paradigm in the digital identity management landscape, aiming to empower users by allowing them greater control over their identity data. Although SSI is a relatively new domain, there have been numerous efforts, primarily from the industry, to introduce SSI standards, protocols, and systems, with multiple options in each category. Researchers eager to contribute to the SSI domain might find it challenging to understand the interconnections among these components. Notably, the SSI domain faces several challenges, as highlighted in various research works. These challenges must be addressed before SSI can achieve widespread adoption. This article presents a comprehensive systematic literature review of SSI, offers a detailed taxonomy, and identifies and analyzes the open challenges in SSI.

Keywords: Self-sovereign identity, digital identity, taxonomy.

Citation: Satybaldy, A., Ferdous, M. S., & Nowostawski, M. (2024). A taxonomy of challenges for self-sovereign identity systems. *IEEE Access*, 12, 16151-16177. DOI: <https://doi.org/10.1109/ACCESS.2024.3357940>

Title of the Article: 45

BlockMeter: An Application Agnostic Performance Measurement Framework for Private Blockchain Platforms

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Abstract

Blockchain Technology is an emerging technology with the potential to disrupt a number of application domains. Though blockchain platforms like Bitcoin and Ethereum have seen immense success and acceptability, their nature of being public and anonymous makes them unsuitable for many enterprise-level use-cases. To address this issue, Linux Foundation has started an open-source umbrella initiative, known as the Hyperledger Platforms. Under this initiative,

a number of private blockchain platforms have been developed. However, the scalability and performance of these private blockchains must be examined to understand their suitability for different use cases. Recent researches and projects on performance benchmarking for private blockchain systems are specific to use cases and generally tied to a blockchain platform. In this article, we present BlockMeter, an application-agnostic performance benchmarking framework for private blockchain platforms. BlockMeter can be utilised to measure the key performance metrics of any application deployed on top of an external private blockchain application in real-time. In this article, we present the architecture of the framework and discuss its different implementation aspects. Then, to showcase the applicability of the framework, we use BlockMeter to evaluate the two most widely used Hyperledger platforms, Hyperledger Fabric and Hyperledger Sawtooth, against a number of use-cases.

Keywords: Blockchain, performance, performance benchmarking, performance metrics, scalability.

Citation: Alom, I., Ferdous, M. S., & Chowdhury, M. J. M. (2023). Blockmeter: An application agnostic performance measurement framework for private blockchain platforms. *IEEE Transactions on Services Computing*, 16(6), 3879-3891. DOI: <https://doi.org/10.1109/TSC.2023.3293724>

Title of the Article: 46

Leveraging self-sovereign identity & distributed ledger technology in renewable energy certificate ecosystems

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Abstract

Renewable Energy Certificates (RECs) are tradable units that represent the commodity in the form of environmental attributes generated for each unit of electricity produced by a renewable energy source. Furthermore, the energy sector's digitalization ushers in new crucial enablers like Distributed Ledger Technology (DLT), which may be used for REC record tracking and trading. Unfortunately, there are a number of outstanding issues such as the lack of a common standard for the representation, communication, and verification of REC, reliance on centralized entities, and others. In order to harness the true potential of energy DLT and REC, it is imperative to address these issues. In this visionary article, we propose a holistic approach which leverages a novel decentralized identity mechanism called Self-sovereign Identity (SSI) and DLT. We present its architecture, based on a rigorous threat model and requirement analysis as well as detailed use-cases to illustrate how the architecture can be used in different REC use-cases.

Keywords: Self-sovereign identity, SSI, Renewable energy certificate, Blockchain technology, REC trading, Architecture

Citation: Ferdous, M. S., Cali, U., Halden, U., & Prinz, W. (2023). Leveraging self-sovereign identity & distributed ledger technology in renewable energy certificate ecosystems. *Journal of cleaner production*, 422, 138355. DOI: <https://doi.org/10.1016/j.jclepro.2023.138355>

Title of the Article: 47

Uncovering local aggregated air quality index with smartphone captured images leveraging efficient deep convolutional neural network

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Abstract

The prevalence and mobility of smartphones make these a widely used tool for environmental health research. However, their potential for determining aggregated air quality index (AQI) based on PM_{2.5} concentration in specific locations remains largely unexplored in the existing literature. In this paper, we thoroughly examine the challenges associated with predicting location-specific PM_{2.5} concentration using images taken with smartphone cameras. The focus of our study is on Dhaka, the capital of Bangladesh, due to its significant air pollution levels and the large population exposed to it. Our research involves the development of a Deep Convolutional Neural Network (DCNN), which we train using over a thousand outdoor images taken and annotated. These photos are captured at various locations in Dhaka, and their labels are based on PM_{2.5} concentration data obtained from the local US consulate, calculated using the NowCast algorithm. Through supervised learning, our model establishes a correlation index during training, enhancing its ability to function as a Picture-based Predictor of PM_{2.5} Concentration (PPPC). This enables the algorithm to calculate an equivalent daily averaged AQI index from a smartphone image. Unlike, popular overly parameterized models, our model shows resource efficiency since it uses fewer parameters. Furthermore, test results indicate that our model outperforms popular models like ViT and INN, as well as popular CNN-based models such as VGG19, ResNet50, and MobileNetV2, in predicting location-specific PM_{2.5} concentration. Our dataset is the first publicly available collection that includes atmospheric images and corresponding PM_{2.5} measurements from Dhaka. Our codes and dataset are available at <https://github.com/lepotatoguy/aqi>.

Citation: Mondal, J. J., Islam, M. F., Islam, R., Rhidi, N. K., Newaz, S., Manab, M. A., ... & Noor, J. (2024). Uncovering local aggregated air quality index with smartphone captured images leveraging efficient deep convolutional neural network. *Scientific Reports*, 14(1), 1627. DOI: <https://doi.org/10.1038/s41598-023-51015-1>

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Title of the Article: 48

Unraveling the effects of a rehabilitation program on the socioeconomic wellbeing of beggars and begging motivation: evidence from an urban area of Bangladesh

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Abstract

Beggars have largely been leading miserable lives in the lower stratum of society since time immemorial. Government or private-led policies are rarely undertaken to improve the lives of this unfortunate societal segment. The local governments in divisional cities of Bangladesh have adopted a series of interventions aimed at improving the socioeconomic wellbeing of beggars and equipping them with alternative livelihood management options. We evaluated the effectiveness of this intervention (the rehabilitation of beggars) in the Khulna City Corporation (KCC) area, Bangladesh; we gathered a sample of 385 beggars by employing the non-equivalent group design and instrumental variable regression method. The results provide an interesting inference, showing that the rehabilitation program seemingly has no far-reaching significant impact on the socioeconomic wellbeing of the beggars. To be precise, the program provides evidence of no significant differences in earnings, expenditure, food security, or personal wellbeing between the beneficiary and the non-beneficiary group of beggars. In addition, the program fails to deter beggars from continuing to beg, as the result shows no significant association between taking part in the program and begging demotivation. Consequently, the beggars are continuing begging, which indicates a critical policy failure on the part of both government and implementation bodies. Therefore, the study implicitly recommends on-track monitoring and timely evaluation of such interventions so that immediate action can be taken beforehand to empower beggars and move them up the social ladder both socially and economically.

Citation: Islam, M. K., Nasrin, N., Naim, J., Ela, M. Z., Rahman, M. M., Alam, A. S. M. M., ... & Hossain, M. T. (2023). Unraveling the effects of a rehabilitation program on the socioeconomic wellbeing of beggars and begging motivation: evidence from an urban area of Bangladesh. *Humanities and Social Sciences Communications*, 10(1), 1-12. DOI: <https://doi.org/10.1057/s41599-023-02196-7>

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Title of the Article: 49

Predicting graduate student's entrepreneurial intentions through innovative teaching in entrepreneurship education: SEM-ANN approach

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Abstract

Purpose: Entrepreneurship education (EE) through innovative teaching techniques (ITEE) and entrepreneurial intention (EI) are two essential components of entrepreneurship development. Using the assumptions of the Theory of Planned Behavior (TPB), we took three constructs: attitude (ATT), subjective norms (SUBNs), and perceived behavioral control (PBC), and from the assumption of Human Capital (HC) theory, we constructed another variable, ITEE. Thus, the fundamental objective of this study is to find out the essential predictor of EI between entrepreneurial antecedents (ATT, SUBNs, PBC) and ITEE through an artificial neural network (ANN).

Design/methodology/approach: Using the snowball sampling technique, a highly structured questionnaire was sent to respondents. Finally, a sample size of 397 business graduate students was chosen.

Findings: The findings revealed that two dimensions of entrepreneurial antecedents (attitude and subjective norm) positively impacted EI. Furthermore, ITEE partially mediated the relationship between two dimensions of entrepreneurial antecedents (attitude and subjective norm) and EI. Moreover, through ANN, we found that attitude (ATT) was a crucial predictor of EI among business graduate students in Bangladesh.

Research limitations/implications: In this study, only business graduate students were included as respondents; thus, further research should include students from other departments or disciplines to generalize the findings.

Practical implications: This study covers numerous actors in terms of practical contributions, including students, academics, the government, and the state. This article should draw the attention of Bangladesh government policymakers regarding the significance of ITEE for developing entrepreneurship. The research framework of this study proposed that ITEE should implement antecedents of entrepreneurship into business education, boosting the ability of students to make judgments, which will also enhance EI in the future.

Originality/value: Integrating the TPB theory with human capital theory represents a significant scholarly advancement in business education for graduate students in Southeast Asia, namely Bangladesh. Furthermore, we developed a novel ITEE scale by synthesizing information from many literary sources, providing valuable insights for future researchers.

Keywords: Business graduate students', Entrepreneurial characteristics, Entrepreneurship education, Innovative teaching techniques

Paper type: Research paper

Citation: Rahman, M. M., Fayolle, A., Dana, L. P., & Rahman, M. N. (2024). Predicting graduate students' entrepreneurial intentions through innovative teaching in entrepreneurship education: SEM-ANN approach. *Education + Training*, 66(2/3), 273-301. DOI: <https://doi.org/10.1108/ET-06-2023-0236>

Title of the Article: 50

Shackled feet: A review of women entrepreneurs' challenges in developing countries

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Abstract

Objective: The fundamental objective of this systematic literature review (SLR) is to explore the current challenges for women entrepreneurs in developing countries and discuss future research opportunities.

Research Design & Methods: We applied a SLR approach to fulfil the objective. We selected 29 articles from SCOPUS and Google Scholar databases to synthesize reviews. To ensure the quality of the articles collected from Google Scholar, we used Scimago Journal & Country Rank (SJR).

Findings: We categorised the key findings into themes (T), contexts (C), and methodologies (M). The major challenges for women entrepreneurs in developing countries cover five themes, i.e. (1) financial, (2) socio-cultural, (3) educational and skills, (4) networking and marketing, (5) political and legal. Developing countries were the main context (C) of this review. Regarding methodologies (M), 51.72% of the collected articles were qualitative.

Implications & Recommendations: Policymakers can help make more specialized women entrepreneurship policies by assembling research identifying national barriers empirically and drawing comparisons between the realities of both countries and regions. We proposed a conceptual framework or model based on the challenges of women entrepreneurship and other future research agendas.

Contribution & Value Added: This review article is one of the leading studies which helps academics, researchers, and readers gain a deeper understanding of challenges for women entrepreneurs in developing countries by providing a foundation for future studies and encouraging researchers to investigate this topic.

Keywords: challenges; entrepreneurship; developing countries; economic development; systematic literature review; women

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Title of the Article: 51

The Arrival of Artificial Intelligence Large Language Models and Vision-Language Models: A Potential to Possible Change in the Paradigm of Healthcare Delivery in Dermatology

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Citation: Gupta, A. K., Talukder, M., Wang, T., Daneshjou, R., & Piguet, V. (2024). The arrival of artificial intelligence large language models and vision-language models: a potential to possible change in the paradigm of healthcare delivery in dermatology. *The Journal of investigative dermatology*, 144(6), 1186-1188. DOI: <https://doi.org/10.1016/j.jid.2023.10.046>

Title of the Article: 52

Predicting m-Commerce Continuance Intention and Price Sensitivity in Indonesia by Integrating of Expectation Confirmation and Post-acceptance Model

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Abstract

This study explored the antecedents of m-commerce continuance usage intention and their impact on the price sensitivity of Indonesian m-commerce customers. The study also incorporates contextual factors, such as perceived risk, trust, efficiency, and functional benefits, into the model to investigate their impact on the satisfaction of m-commerce users. Moreover, it examines how the efficient and functional benefits of m-commerce affect price sensitivity. The study employed online questionnaires to gather data from m-commerce users in Indonesia. The hypothesis was tested using a partial least squares technique with Smart-PLS. This study demonstrates that user satisfaction with mobile commerce has a significant impact on their intention to continue using it, which in turn affects their price sensitivity. The study found perceived risk, trust, efficiency, and functional benefit to be significant determinants of satisfaction in m-commerce usage. The study also found that trust, efficiency, and functional benefits influence the continuance use of m-commerce, while perceived risk is not an intervening variable for continuance intention among m-commerce users. Furthermore, the results show that perceived risk, trust, and functional benefit influence a user's price sensitivity, whereas efficiency was not found to be a determinant in influencing price sensitivity. However, the study found that continuance usage intention and satisfaction serially mediated the link between efficiency and price sensitivity, as well as the link between functional benefit and price sensitivity. The outcome of this study would be useful for managers and practitioners who find it difficult to retain their customers' continued intention to purchase their products and services.

Keywords: continuance use intention, price sensitivity, satisfaction, trust, benefit, m-commerce

Citation: Susanto, P., Hoque, M. E., Nisaa, V., Islam, M. A., & Kamarulzaman, Y. (2023). Predicting m-commerce

continuance intention and price sensitivity in Indonesia by integrating of expectation-confirmation and post-acceptance model. *SAGE Open*, 13(3), 21582440231188019. DOI: <https://doi.org/10.1177/21582440231188019>

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Title of the Article: 53

Dynamic regime differences in the market behavior of primary natural resources in response to geopolitical risk and economic policy uncertainty

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Abstract

The study explores the dynamic effects of geopolitical risks and economic policy uncertainties on oil and natural gas prices in the US market's less volatile and highly volatile regimes, employing Markov regime-switching dynamic regression models (MS-DR) with monthly data from January 2000 to November 2022. Our empirical results demonstrate that a positive shock in the geopolitical risk of the USA (GPR_US) causes an increase in the growth rate of the prices of WTI at the high volatile periods (regime 1), and its one-period lagged effects are negative at time t in the less volatile periods (regime 0), and it cumulatively causes an increase in WTI price. GPR_US and one lagged effect negatively and positively natural gas prices (NGAS) at both regimes. respectively, where the dynamic cumulative impact of GPR_US causes NGAS to increase. World geopolitical risks (GPR) lead to an increase in WTI and natural gas prices. Furthermore, US economic policy exerts a reduction in WTI price at both less and highly volatile regimes, and its lag influences are positive at both regimes, where it cumulatively causes a decrease in WTI price. In a similar manner, global economic policy uncertainty also reduces WTI. US economic policy and its lag effects exhibit an increase and decrease in NGAS prices in the high volatile regime but exhibited a cumulatively positive response to shock in economic policy uncertainty. Global economic policy uncertainty causes nature gas prices to go up. Hence, geopolitical risks and economic policy uncertainty might have a complex impact on the prices of natural resources. It depends on the specific circumstances and the supply-demand dynamics in the market. Our findings offer insightful implications for economic agents.

Keywords: Natural gas prices, Oil prices, Geopolitical risk, Economic policy uncertainty, Markov regime switching

Citation: Muğaloğlu, E., Kuşkaya, S., Aldieri, L., Alnour, M., Hoque, M. E., Magazzino, C., & Bilgili, F. (2023). Dynamic regime differences in the market behavior of primary natural resources in response to geopolitical risk and economic policy uncertainty. *Resources Policy*, 87, 104340. <https://doi.org/10.1016/j.resourpol.2023.104340>

Title of the Article: 54

Modeling the intention and adoption of food waste prevention practices among Chinese households

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Abstract

Considerable attention has been paid to the problem of food waste on a worldwide scale. Evidence demonstrates that food waste occurs mostly in private households, and that home food waste has been identified as the leading cause of global food waste. Home food waste poses a severe threat to food security and involves environmental and financial ramifications. While this is a global issue, most studies on what motivates people to make changes that would result in less food waste have been conducted in wealthy countries. Integrating the Theory of Interpersonal Behavior (TIB), this study fills this gap by investigating the factors influencing Chinese household consumers' intentions toward food waste reduction and their actual food waste behavior. This study used a cross-sectional survey approach to collect data from households using social media platforms. Partial least squares structural equation modeling was adopted to assess and evaluate the conceptual model. The empirical findings demonstrate that cognitive (perceived value of sustainability), environmental (awareness of consequences and ascription of responsibility), social (social norms), and emotional (anticipated guilt) aspects tend to have a positive influence on Chinese household consumers' intentions toward reducing food waste, suggesting that interpersonal behavior could reduce food consumption in developing countries like China. Furthermore, the findings show that the intention to decrease food waste serves as an intermediary variable that highlights another route of association between the TIB factors and actual food waste reduction behavior. The findings will be more informative to policymakers, marketers, and researchers in developing strategies to reduce food waste.

Citation: Ma, Y., Al Mamun, A., Ali, M. H., Hoque, M. E., & Lili, Z. (2023). Modeling the intention and adoption of food waste prevention practices among Chinese households. *Humanities and Social Sciences Communications*, 10(1), 1-12. DOI: <https://doi.org/10.1057/s41599-023-02348-9>

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Title of the Article: 55

Modeling the intention to consume and willingness to pay premium price for 3D-printed food in an emerging economy

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Abstract

This study examined the factors influencing customers' consumption intentions and willingness to pay a premium price for 3D-printed food by combining personal innovativeness, perceived compatibility, perceived product value, desire to eat, and willingness to pay a premium price for 3D-printed food into a conceptual framework. Applying the extended theory of planned behavior (TPB) framework with personal innovativeness, perceived compatibility, and perceived product value, this study obtained data from 1540 respondents using an online cross-sectional questionnaire and utilized partial least squares structural equation modeling to verify the study hypotheses. The findings revealed that personal inventiveness, attitude, perceived compatibility, subjective norms, perceived product value, and perceived behavioral control exert a significant influence on the intention and willingness to pay a premium price for 3D-printed food. The result also showed that perceived behavior and intention significantly affect willingness to pay a premium price for 3D-printed food. Furthermore, the outcome confirmed that, with the exception of the link between perceived product value, subjective norms, and willingness to pay a premium price for 3D-printed food, intention serves as a significant mediator in the relationship between factors and willingness to pay a premium price for 3D-printed food. This research contributes to the theoretical understanding of the factors that influence consumers' intention to consume and willingness to pay a premium for 3D-printed food, providing new insights from new variables and broadening the scope of the TPB's original model in the perspective of new food settings and Asian nations. These findings imply that 3D-printed food sellers in the Asian market need to pay more attention to the factors that stimulate customers' intentions, which, in turn, affect consumers' views of perceived product value and improve their readiness to pay a premium price for 3D-printed food.

Citation: Yang, M., Gao, J., Yang, Q., Al Mamun, A., Masukujjaman, M., & Hoque, M. E. (2024). Modeling the intention to consume and willingness to pay premium price for 3D-printed food in an emerging economy. *Humanities and Social Sciences Communications*, 11(1), 1-14. DOI: <https://doi.org/10.1057/s41599-024-02776-1>

Title of the Article: 56

The mutual effects of residential energy demand and climate change in the United States: A wavelet analysis

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Abstract

This study examines the complex and time-varying relationship between residential energy demand (including electricity, geothermal, and solar energy) and climate change using wavelet analyses with monthly USA data from January 1990 to March 2023. The results show that residential energy demand and climate change indicators exhibit a time-varying interrelationship with cyclical and lag effects. Specifically, before 2021, a positive correlation between residential electricity demand and carbon dioxide (CO₂) emissions in short-term frequencies was found, but the relationship reversed thereafter, with an increase in CO₂ levels influencing and decreasing residential electricity demand. In the long run frequencies, the link between residential power consumption and CO₂ emissions shifted over time, exhibiting inconsistent co-movement. The co-movements between residential geothermal and CO₂ show predominantly positive correlations, with CO₂ leading the relationship in the short run, while geothermal leads the co-movements in the long run. In both short and long-term frequencies, the dependency and co-movement between residential solar and CO₂ are mixed, with residential solar leading to positive correlations and CO₂ leading to negative correlations. Therefore, improved insulation, energy-efficient windows, and high-efficiency heating systems can all assist in reducing heat loss and the total energy demand for domestic heating and subsequently low CO₂ emissions.

Keywords: Residential energy, Energy demand, Climate change, Wavelet analysis, USA

Citation: Bilgili, F., Kuskaya, S., Magazzino, C., Khan, K., Hoque, M. E., Alnour, M., & Onderol, S. (2024). The mutual effects of residential energy demand and climate change in the United States: A wavelet analysis. *Environmental and Sustainability Indicators*, 22, 100384. <https://doi.org/10.1016/j.indic.2024.100384>

Title of the Article: 57

Time-frequency connectedness and spillover among carbon, climate, and energy futures: Determinants and portfolio risk management implications

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Abstract

This study examines returns and volatility connectedness and spillover among carbon, climate, and energy futures

using TPV-VAR frequency connectedness approach with daily frequency observations from December 15, 2020 to September 23, 2022. The study also evaluates factors that contribute to connectedness and explores hedging benefits from using carbon and climate futures with bivariate and multivariate portfolio strategies. This study reveals higher levels of total return and volatility connectedness and spillover effects across carbon, climate, and energy futures markets. There are persistent high spillovers in the short term, but spillovers are lower in the long run. These spillover effects are time-varying and change with economic, geopolitical, financial market events. For return and volatility spillover, carbon, climate, natural gas, gasoil and coal futures serve as net informational and risk recipients while Brent crude oil, heating oil and gasoline futures serve as informational and risk transmitters. This transmission mechanism remains consistent in the short term. However, in the long term, crude oil futures became a net receiver, while climate change futures changed to a risk transmitter. The findings indicate that transmission mechanism changed during the Russia-Ukraine war, whereby carbon, Brent crude oil, heating oil, gasoline and gas oil futures played different roles in the return and volatility spillover network. We find that geopolitical risk, equity market volatility, global financial stress, and clean energy innovations are determinants of return and volatility connectedness. Understanding the interrelations among carbon, climate and energy markets can guide policy making to improve the effectiveness of climate actions. The findings also underline the hedging and portfolio diversification implications of carbon and climate futures for energy commodities market.

Keywords: Carbon futures, climate change futures, Energy futures, spillover, Hedging, Portfolio

Citation: Hoque, M. E., Soo-Wah, L., & Billah, M. (2023). Time-frequency connectedness and spillover among carbon, climate, and energy futures: Determinants and portfolio risk management implications. *Energy Economics*, 127, 107034. <https://doi.org/10.1016/j.eneco.2023.107034>

Title of the Article: 58

Volatility interconnectedness among financial and geopolitical markets: Evidence from COVID-19 and Ukraine-Russia crises

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Abstract

This study investigates the interconnectedness of volatility and spillovers among various financial and geopolitical markets during the COVID-19 pandemic and the Ukraine-Russia crises. Utilizing a Time-Varying Parameter Frequency Vector Autoregression (TVP-VAR) approach, we analyze daily data spanning from January 2015 to June 2022. Our empirical findings reveal substantial interconnectedness and spillovers among geopolitical risk (GPR), oil & gas, gold, conventional stock, Islamic stocks, and sukuk markets, particularly heightened during the crises periods. Interestingly, we observe a lower level of risk spillover during the Ukraine-Russia conflict compared to the COVID-19 pandemic. Short-frequency risk spillovers dominate over long-frequency ones. Moreover, our results indicate that conventional equity, Islamic equity, oil, and gas sectors predominantly act as net-risk transmitters, while sukuk, gold, and GPR serve as net-risk receivers across both short- and long-term frequencies. Specifically, during the COVID-19 crisis, conventional equity, Islamic equity, oil, and gas sectors emerge as net-risk transmitters, while

sukuk, gold, and GPR act as net informational receivers in total and long-term frequencies. Conversely, during the Ukraine-Russia conflict, the oil and gas sector, sukuk, gold, and GPR assume net-risk receiver roles, with conventional equity and Islamic equity acting as net transmitters in total and short-term spillovers. Notably, oil & gas, gold, conventional stocks, Islamic stocks, and sukuk markets exhibit lower sensitivity to geopolitical risk during both crises, suggesting their potential utility in hedging against such risk. These findings offer valuable insights for investment risk management strategies.

Keywords: Volatility connectedness, Geopolitical risk, Oil & Gas, Gold, Conventional stock, Sukuk markets, COVID-19, Ukraine-Russia crises

Citation: Hoque, M. E., Sahabuddin, M., & Bilgili, F. (2024). Volatility interconnectedness among financial and geopolitical markets: Evidence from COVID-19 and Ukraine-Russia crises. *Economic Analysis and Policy*, 82, 303-320. DOI: <https://doi.org/10.1016/j.eap.2024.03.015>

Title of the Article: 59

What do we know about spillover between the climate change futures market and the carbon futures market?

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Abstract

Climate action-based assumptions and tradable characteristics underpinned the development of climate change futures contracts, which are related to carbon and climate markets. Therefore, this paper examines return and volatility spillover between climate change futures and carbon allowance futures using dynamic conditional correlation (DCC) and asymmetric dynamic conditional correlation (ADCC) models with daily and weekly frequency data. Considering the emergence of US market-based carbon futures and climate futures, this study explores bivariate optimal hedging strategies and optimal portfolio strategies. Using daily data, this study discovers unidirectional and positive return and volatility spillover from the carbon futures market to the climate change futures market, implying opportunities for diversification and hedging. The weekly analysis shows bidirectional and negative return spillover between the carbon futures market and the climate change futures market, implying opportunities for risk hedging. In addition, it also reveals unidirectional and positive volatility spillovers from the carbon futures market to the climate change futures market. The carbon market dominates the climate change futures market. The study also reveals that optimal portfolio strategies will be preferred over optimal hedging strategies. Therefore, this study offers practical implications for investors and portfolio managers.

Keywords: Carbon market · Climate change · Futures · Spillover · DCC-ADCC · Hedging

Citation: Hoque, M. E., Bilgili, F. A. İ. K., & Batabyal, S. (2023). What do we know about spillover between the

climate change futures market and the carbon futures market?. *Climatic change an interdisciplinary, international journal devoted to the description, causes and implications of climatic change*, 176(166). DOI: <https://doi.org/10.1007/s10584-023-03640-y>

Title of the Article: 60

Compatibility as a pivotal design factor for digital concierge apps: exploring hotel guests' socio-psychological dynamics

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Abstract

Purpose: This paper addresses a crucial research need by examining the influence of compatibility, a pivotal design element for hotel concierge apps, on the socio-psychological dynamics of digital hotel guests. While prior research has examined the constructs, their application to digital concierge apps introduces a unique context. We posit that compatibility significantly influences central variables rooted in theory of planned behaviors (TPBs) and technology acceptance model (TAM), fostering positive usage intentions.

Design/methodology/approach: Analyzing data from 668 four-star hotel guests through PLS-SEM substantiates compatibility's role, endorsing the theoretical amalgamation of affordance, TPB, and TAM frameworks.

Findings: Compatibility positively affected perceived ease of use, perceived usefulness, and attitude toward behavior. Besides, usage intention positively affected willingness to pay a price premium and revisit intention.

Originality/value: This paper adopts compatibility as a unifying force for integrating TPB and TAM; the predictive ability of digital concierges' usage intentions on revisit intentions to upscale hotels. Further, this paper is the first attempt to highlight employing compatibility as a pivotal design factor for digital concierge apps in the hospitality setting.

Keywords: Compatibility, Hotel industry, Technology affordance theory, Digital concierge, Usage intention

Paper type: Research paper

Citation: Tan, C. C., Islam, M. S., Sinha, R., Shehata, A. E., & Selem, K. M. (2024). Compatibility as a pivotal design factor for digital concierge apps: exploring hotel guests' socio-psychological dynamics. *Kybernetes*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/K-12-2023-2658>

Title of the Article: 61

Nexus of customer adaptation to mannequins with visit intention to full-service restaurants: Role of spatial layout

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Abstract

The primary purpose of this paper is to highlight the relationships between mannequins' usage in restaurants, customers' social isolation, and visit intention to full-service restaurants in the context of contagious diseases. Data were collected from 507 customers of 22 full-service restaurants in Greater Cairo. Data were analyzed in SmartPLS 4.4. The results supported the relationships between social loneliness and relative advantage, compatibility, and social support, along with the linkage between social loneliness and intention to visit the restaurant. Furthermore, the paper explores the moderating role of spatial layout between social loneliness and visit intention in these restaurants. There was no relationship between self-regulatory efficacy and social loneliness. Thus, the paper extends existing knowledge on customers' social reactions to social clues, such as mannequins and physical restaurant layouts, to facilitate customer adaptation to these innovative solutions in crises.

Keywords: Mannequins, Spatial layout, Full-service restaurants, Social loneliness, Customer adaptation

Citation: Selem, K. M., Islam, M. S., Aureliano-Silva, L., & Shehata, A. E. (2023). Nexus of customer adaptation to mannequins with visit intention to full-service restaurants: role of spatial layout. *International Journal of Hospitality Management*, 115, 103608. DOI: <https://doi.org/10.1016/j.ijhm.2023.103608>

Title of the Article: 62

Deciphering asymmetric spillovers in US industries: Insights from higher-order moments

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Abstract

Incorporating higher-order moments, like realized volatility, skewness, and kurtosis, is crucial for understanding asymmetric asset pricing trends. Our research rigorously calculates static and dynamic higher-order moment spillovers across nine distinct US industries, using ultra-high-frequency data. We dive into the complex factors driving these spillovers, examining micro and macro-level factors. Our findings illuminate how higher-order moments are transmitted among these industries, particularly during disruptive global events with time-varying patterns. Notably, we discover that crash risk's persistence surpasses that of volatility risk, highlighting a significant divergence in market agents' asset pricing mechanisms. Importantly, firm-level risk factors significantly influence crash risk, showing an inverse relationship with industry-specific uncertainty. On the other hand, external macro-level risk factors directly impact the realized volatility of these industries. Our study's insights have substantial implications for various stakeholders, including investors, fund managers, policymakers, and financial regulators.

Keywords: Realized volatility, Realized skewness, Realized kurtosis, Higher moment-order transmission, Disruptive global events

Citation: Shafiullah, M., Senthilkumar, A., Lucey, B. M., & Naeem, M. A. (2024). Deciphering asymmetric spillovers in US industries: Insights from higher-order moments. *Research in International Business and Finance*, 70, 102313. DOI: <https://doi.org/10.1016/j.ribaf.2024.102313>

Title of the Article: 63

Exploring the determinants of green bond market development in Bangladesh

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Abstract

Our study is a pioneering endeavor to comprehensively explore the pivotal factors influencing the growth trajectory of the green bond (GB) market in Bangladesh, aligning with the nation's Sustainable Development Goals (SDGs) in the aftermath of the COVID-19 pandemic. Leveraging the opinions of fifteen local experts, we employ the Analytic Hierarchy Process (AHP) methodology to discern and prioritize the key determinants. Our findings indicate that infrastructure and financial factors emerge as crucial determinants significantly shaping the developmental landscape of the GB market in Bangladesh. Moreover, within the spectrum of twenty-eight sub-factors examined, legal frameworks, the monetary policy of the Central Bank of Bangladesh, institutional infrastructures, and fiscal policies are identified as direct influencers impacting the expansion of the GB market. Consequently, we advocate for a strategic policy focus on infrastructure and financial facets to foster the growth of Bangladesh's GB markets, particularly in the post-COVID-19 era.

Keywords: Green bond, Sustainable development goals, Analytic hierarchy process, Post-COVID-19, Bangladesh

Citation: Hasan, M. B., Rashid, M. M., Sarker, T., & Shafiullah, M. (2024). Exploring the determinants of green bond market development in Bangladesh. *Eurasian Economic Review*, 14(1), 213-233. DOI: <https://doi.org/10.1007/s40822-023-00253-9>

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Title of the Article: 64

Tail risk spillovers between Shanghai oil and other markets

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Abstract

This paper uses daily returns data from January 2011 to December 2022 to analyse the tail risk spillovers between Shanghai oil and a sample of stock and commodities markets. The computed CAViaR measures each market's tail risk and analyses the connectedness network using the TVP-VAR method. The tail risk spillover network estimates reveal clustering—as stocks and commodities within the same category are vigorously connected. Shanghai oil's links to the global markets remain limited, but it is a net risk receiver. As such, Shanghai oil is a lesser player in the global financial system than WTI or Brent. Nevertheless, (tail risk) connectedness between Shanghai oil and sample markets soars during crises such as the shale oil revolution, the COVID-19 pandemic, and the Russia-Ukraine war. Among the crises, COVID-19 has had the most potent effect on our markets—with connectedness indicators exceeding 70%. The spillover size and shape differ considerably by crisis events. Thus, Shanghai oil futures may be viewed as a novel financial market that permits both domestic and international investors to access the Chinese crude oil market and diversify their investment risk.

Keywords: CAViaR, Commodities, Shanghai oil, Tail risk spillovers, TVP-VAR

Citation: Naeem, M. A., Gul, R., Shafiullah, M., Karim, S., & Lucey, B. M. (2024). Tail risk spillovers between Shanghai oil and other markets. *Energy Economics*, 130, 107182. DOI: <https://doi.org/10.1016/j.eneco.2023.107182>

Title of the Article: 65

The effect of financial stress on renewable energy consumption: Evidence from US data.

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Abstract

The planet earth is facing an unprecedented level of environmental crisis fuelled primarily by the exorbitant level of carbon stock in the atmosphere. Hence, our sustainable living in this planet depends greatly on mitigating anthropogenic greenhouse gas emission. This calls for a paradigm shift of energy epicentre from traditional fossil fuels to renewable energy. The transition, however, is not smooth because numerous obstacles deter large-scale penetration of renewable energy. This study aims to examine the impact of financial stress on renewable energy consumption in the USA. We avail nonparametric and quantile econometric techniques on monthly data between 1986 and 2016. Results show a negative effect of financial stress on renewable energy consumption in the long run. Analysis further shows that financial stress unidirectionally Granger causes renewable energy in the long run—with greater prominence in the upper half of the distribution. However, consumers tend to substitute fossil fuel with renewable energy during the time of higher financial stress, perhaps as an attempt to seek relief from augmented financial strain. This implies that the benefits of adopting renewables are considerable notwithstanding the (energy generation) project scale and adoption rate in the economy.

Keywords: Renewable energy, Financial stress, USA, Climate finance, Fossil fuel

Citation: Miah, M. D., Shafiullah, M., & Alam, M. S. (2024). The effect of financial stress on renewable energy consumption: Evidence from US data. *Environment, Development and Sustainability*, 26(10), 26623-26646. DOI: <https://doi.org/10.1007/s10668-023-03747-3>

Title of the Article: 66

When one domino falls, others follow: A machine learning analysis of extreme risk spillovers in developed stock markets

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Abstract

This study investigates the potential for extreme risk spillovers across developed stock markets using a machine learning approach. We utilize a novel methodology, proposed by Keilbar and Wang (2022), that combines extreme value theory with artificial neural networks to quantify the likelihood and magnitude of risk spillovers among twenty-three major developed stock markets for the period encompassing January 1991 to July 2022. The results reveal significant evidence of risk spillovers across the markets based on the extent of trade integration among countries. Secondly, during prolonged and vigorous periods of crisis events, extreme risk spillovers and corresponding contagion(s) within this integrated system of markets are likely to return. Moreover, the authors find that the magnitude of spillovers can be influenced by factors such as economic interconnectedness, size, book-to-market, investment portfolio and financial market volatility. The study offers important insights into the nature and dynamics of risk spillovers in developed stock markets and highlights the potential benefits of incorporating machine learning techniques into risk management strategies.

Keywords: Extreme risk spillovers, Neural networks, Quantile regression, CoVaR, Tail risk

Citation: Karim, S., Shafiullah, M., & Naeem, M. A. (2024). When one domino falls, others follow: A machine

Title of the Article: 67

MultiModal Ensemble Approach Leveraging Spatial, Skeletal, and Edge Features for Enhanced Bangla Sign Language Recognition

Authors and Affiliations:

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Abstract

Sign language is the predominant mode of communication for individuals with auditory impairment. In Bangladesh, BdSL or Bangla Sign Language is widely used among the hearing-impaired population. However, because of the general public's limited awareness of sign language, communicating with them using BdSL can be challenging. Consequently, there is a growing demand for an automated system capable of efficiently understanding BdSL. For automation, various Deep Learning (DL) architectures can be employed to translate Bangla Sign Language into readable digital text. The automation system incorporates live cameras that continuously capture images, which a DL model then processes. However, factors such as lighting, background noise, skin tone, hand orientations, and other aspects of the image circumstances may introduce uncertainty variables. To address this, we propose a procedure that reduces these uncertainties by considering three modalities: spatial information, skeleton awareness, and edge awareness. We introduce three image pre-processing techniques alongside three CNN models. The CNN models are combined using nine distinct ensemble meta-learning algorithms, with five of them being modifications of averaging and voting techniques. In the result analysis, our individual CNN models achieved higher training accuracy at 99.77%, 98.11%, and 99.30%, respectively, than most of the other state-of-the-art image classification architectures, except for ResNet50, which achieved 99.87%. Meanwhile, the ensemble model attained the highest accuracy of 95.13% on the testing set, outperforming all individual CNN models. This analysis demonstrates that considering multiple modalities can significantly improve the system's overall performance in hand pattern recognition.

Keywords: Bangla sign language (BdSL), convolutional neural network, ensemble method.

Citation: Shams, K. A., Reaz, M. R., Rafi, M. R. U., Islam, S., Rahman, M. S., Rahman, R., ... & Alamri, A. (2024). MultiModal Ensemble Approach Leveraging Spatial, Skeletal, and Edge Features for Enhanced Bangla Sign Language Recognition. *IEEE Access*. DOI: <https://doi.org/10.1109/ACCESS.2024.3410837>

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Title of the Article: 68

Dynamic Spectrum Sharing for 5G NR and 4G LTE Coexistence - A Comprehensive Review

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Abstract

In the early phase, the number of new radio (NR) users is considerably low compared to the long-term evolution (LTE) users. Hence, allocating the LTE spectrum to a small number of NR users will have a detrimental effect on the LTE users. To overcome this backdrop, dynamic spectrum sharing (DSS) between LTE and NR has become an emerging technology where both systems can coexist on the same LTE spectrum. However, the most critical factor for LTE and NR coexistence is to share the spectrum resources of LTE systems with data and control signals necessary to operate NR systems subject to not impacting LTE operations. In line with this, a comprehensive understanding of DSS for LTE and NR coexistence taking into account diversified concerns is presented in this paper. First, an overview of the technological background of essential signals and channels of both LTE and NR systems to enable DSS for their coexistence is given. Numerous deployment options and potential design considerations of DSS are then discussed. The application of DSS to both multicast-broadcast single-frequency network (MBSFN) and non-MBSFN LTE subframes under NR with and without synchronization signal/ physical broadcast channels (PBCH) block (SSB) transmissions is examined. Further, the third-generation partnership project (3GPP) standardization activities towards DSS in its different releases are discussed, numerous use cases are highlighted, and the significance and limitations of DSS are identified. To provide additional insights, the relative comparison of potential aspects of several DSS concerns including, deployment options, design considerations, DSS applications, and 3GPP standardization efforts, is carried out. Finally, a summary of key lessons learned is provided in terms of numerous facts and figures.

Citation: Saha, R. K., & Cioffi, J. M. (2024). Dynamic spectrum sharing for 5G NR and 4G LTE coexistence-A comprehensive review. *IEEE Open Journal of the Communications Society*, 5, 795-835. DOI: <https://doi.org/10.1109/OJCOMS.2024.3351528>

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Title of the Article: 69

Energy-Efficient Synchronization in Industrial Internet of Things: An Intelligent Neighbor-Knowledge Approach

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Abstract

In the Industrial Internet of Things (IIoT), energy efficiency is a paramount concern as it directly affects operational longevity. Traditional approaches, like flooding for time synchronization, often result in redundant message transmissions, thereby wasting energy. This article introduces an intelligent neighbor-knowledge synchronization (INKS) method to mitigate this problem. The INKS algorithm leverages each node's understanding of its neighboring nodes to optimize the synchronization process, thereby reducing the total number of synchronization messages and conserving energy. The INKS is implemented and evaluated using real wireless sensor networks with varying configurations. The experimental results demonstrate their superior performance to existing techniques, such as rapid flooding multiple one-way broadcast time synchronization (RMTS). Additionally, the performance of INKS is evaluated through simulations conducted on large-scale networks. For the network topology of the four-way grid, the findings reveal that INKS reduces the number of transmitted messages by approximately 72% compared to RMTS. Moreover, INKS matches the efficiency of scheduling-based low-energy synchronization for IIoT.

Keywords: Industrial Internet of Things (IIoTs), intelligent neighbor-knowledge synchronization (INKS), low energy, time synchronization, wireless sensor network (WSN).

Citation: Elsharief, M., Emran, A., Hassan, H., Sabuj, S. R., & Jo, H. S. (2024). Energy-Efficient Synchronization in Industrial Internet of Things: An Intelligent Neighbor-Knowledge Approach. *IEEE Transactions on Industrial Informatics*. DOI: <https://doi.org/10.1109/TII.2024.3369236>

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Title of the Article: 70

Personal internet of things networks: An overview of 3GPP architecture, applications, key technologies, and future trends

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Abstract

The use of the personal Internet of Things (PIoT) is rapidly expanding across a range of application areas. It is needed for real-time monitoring, wireless coverage, remote sensing, delivery, security, surveillance, and civil

infrastructure inspection. Smart PIIoT devices provide new opportunities in wearable, public, and home automation, making them the next significant development in PIIoT technology. The study provides a comprehensive overview of PIIoT systems, including their architecture, applications, technology, and future developments. This paper begins with a comprehensive overview of prior research about the PIIoT network. Then, we present an overview of PIIoT classification and a comprehensive explanation of the PIIoT architecture. We also investigate the requirements and technology of the PIIoT network. Additionally, we provide a thorough examination of several applications for PIIoT networks. Moreover, we emphasize some significant challenges and ongoing problems confronting the PIIoT network. Finally, we address recent research trends and outline potential future study directions.

Keywords: Internet of things Body-area PIIoT network Classification Network applications Private PIIoT network Public PIIoT network And PIIoT technologies

Citation: Eusufzai, F., Bobby, A. N., Shabnam, F., & Sabuj, S. R. (2024). Personal internet of things networks: An overview of 3GPP architecture, applications, key technologies, and future trends. *International journal of intelligent networks*, 5, 77-91. DOI: <https://doi.org/10.1016/j.ijin.2024.02.001>

Title of the Article: 71

Revolutionizing Batteryless IoT Systems to Enhance Nonlinear Energy Harvesting Using RIS Active and Passive Elements

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Abstract

Enhancing Internet of Things (IoT) communications through Reconfigurable Intelligent Surfaces (RIS) necessitates novel approaches that go beyond the conventional deployment of passive elements. This paper introduces an efficient method to enhance IoT system performance by combining active and passive functionality in RISs: an active and passive integrated approach. One identified enhancement area is efficiently managing signal throughput and exchanges in IoT systems, which is essential for supporting numerous devices. For this challenge, we propose a thorough process model that describes channel gains, develops a nonlinear energy harvesting, and identifies device-to-device communication schemes without violating information causality. The innovative component of our work is the utilization and strategic application of RIS panels that benefit from the advantages of active and passive components synergism to solve thermal noise issues and optimize signal reflection and transmission. An advanced optimization mechanism is developed based on mixed-integer nonlinear programming: an enabling approach between performance efficiency and maximum service utilization. Our simulation analysis show that developed RIS panels optimize IoT system performance and surpass existing performance indicators in conventional RIS-less systems.

Keywords: Batteryless IoT sensor, D2D communications, nonlinear energy harvesting model, RIS active and passive elements

Citation: Ahmed, S., Kamal, A. E., Selim, M. Y., Sabuj, S. R., & Hamamura, M. (2024). Revolutionizing batteryless IoT systems to enhance nonlinear energy harvesting using RIS active and passive elements. *IEEE Open Journal of the Communications Society*. DOI: <https://doi.org/10.1109/OJCOMS.2024.3393480>

Title of the Article: 72

Transformation of Applied Linguistics in the Global South context of Bangladesh: Researcher agency, imagination, and north-south cooperation

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Abstract

This article examines the transformation of applied linguistics knowledge production in the Global South taking postcolonial Bangladesh as a case. In the 1990s, one could not locate even a dozen applied linguistics articles in international journals authored by Bangladeshi researchers. However, in about two decades, Bangladeshi researchers can claim hundreds of journal articles, book chapters, monographs, and edited volumes. Drawing on bibliometric data and autoethnography, this article seeks to document a new dawn in applied linguistics research in Bangladesh complemented by researchers' engagement in Southern epistemological thinking in a decolonial spirit. While demonstrating the role of researcher agency and imagination in this transformation, we also highlight the role of North-South interaction and collaboration. We argue that despite the hegemony of Eurocentric views underpinning language, epistemology and geopolitics of knowledge, there may be hope for Southern applied linguists to decolonize their research imagination and bring disciplinary changes in line with Southern perspectives to make the world a better place for the global community.

Citation: Hamid, M. O., Sultana, S., & Roshid, M. M. (2024). Transformation of applied linguistics in the Global South context of Bangladesh: Researcher agency, imagination, and North-South cooperation. *Applied Linguistics*, amae037. <https://doi.org/10.1093/applin/amae037>

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Title of the Article: 73

In Silico Functional Characterization of a Hypothetical Protein From *Pasteurella Multocida* Reveals a Novel S-Adenosylmethionine-Dependent Methyltransferase Activity

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Abstract

Genomes may now be sequenced in a matter of weeks, leading to an influx of “hypothetical” proteins (HP) whose activities remain a mystery in GenBank. The information included inside these genes has quickly grown in prominence. Thus, we selected to look closely at the structure and function of an HP (AFF25514.1; 246 residues) from *Pasteurella multocida* (PM) subsp. *multocida* str. HN06. Possible insights into bacterial adaptation to new environments and metabolic changes might be gained by studying the functions of this protein. The PM HN06 2293 gene encodes an alkaline cytoplasmic protein with a molecular weight of 28352.60 Da, an isoelectric point (pI) of 9.18, and an overall average hydropathicity of around -0.565 . One of its functional domains, tRNA (adenine (37)-N6)-methyltransferase TrmO, is a S-adenosylmethionine (SAM)-dependent methyltransferase (MTase), suggesting that it belongs to the Class VIII SAM-dependent MTase family. The tertiary structures represented by HHpred and I-TASSER models were found to be flawless. We predicted the model’s active site using the Computed Atlas of Surface Topography of Proteins (CASTp) and FTSite servers, and then displayed it in 3 dimensional (3D) using PyMOL and BIOVIA Discovery Studio. Based on molecular docking (MD) results, we know that HP interacts with SAM and S-adenosylhomocysteine (SAH), 2 crucial metabolites in the tRNA methylation process, with binding affinities of 7.4 and 7.5 kcal/mol, respectively. Molecular dynamic simulations (MDS) of the docked complex, which included only modest structural adjustments, corroborated the strong binding affinity of SAM and SAH to the HP. Evidence for HP’s possible role as an SAM-dependent MTase was therefore given by the findings of Multiple sequence alignment (MSA), MD, and molecular dynamic modeling. These in silico data suggest that the investigated HP might be used as a useful adjunct in the investigation of *Pasteurella* infections and the development of drugs to treat zoonotic pasteurellosis.

Keywords: *Pasteurella multocida*, Pasteurellosis, Novel SAM-dependent MTase, Hypothetical protein, Molecular docking, Molecular dynamics

Citation: Masum, M. H. U., Rajia, S., Bristi, U. P., Akter, M. S., Amin, M. R., Shishir, T. A., ... & Saha, O. (2023). In silico functional characterization of a hypothetical protein from *Pasteurella multocida* reveals a novel S-Adenosylmethionine-dependent methyltransferase activity. *Bioinformatics and Biology Insights*, 17, 11779322231184024. DOI: <https://doi.org/10.1177/11779322231184024>

Title of the Article: 74

Antiviral Activity, Pharmacoinformatics, Molecular Docking, and Dynamics Studies of *Azadirachta indica* Against Nipah Virus by Targeting Envelope Glycoprotein: Emerging Strategies for Developing Antiviral Treatment

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Abstract

The Nipah virus (NiV) belongs to the Henipavirus genus is a serious public health concern causing numerous outbreaks with higher fatality rate. Unfortunately, there is no effective medication available for NiV. To investigate possible inhibitors of NiV infection, we used in silico techniques to discover treatment candidates in this work. As there are not any approved treatments for NiV infection, the NiV-enveloped attachment glycoprotein was set as target for our study, which is responsible for binding to and entering host cells. Our in silico drug design approach

included molecular docking, post-docking molecular mechanism generalised born surface area (MM-GBSA), absorption, distribution, metabolism, excretion/toxicity (ADME/T), and molecular dynamics (MD) simulations. We retrieved 418 phytochemicals associated with the neem plant (*Azadirachta indica*) from the IMPPAT database, and molecular docking was used to ascertain the compounds' binding strength. The top 3 phytochemicals with binding affinities of -7.118 , -7.074 , and -6.894 kcal/mol for CIDs 5280343, 9064, and 5280863, respectively, were selected for additional study based on molecular docking. The post-docking MM-GBSA of those 3 compounds was -47.56 , -47.3 , and -43.15 kcal/mol, respectively. As evidence of their efficacy and safety, all the chosen drugs had favorable toxicological and pharmacokinetic (Pk) qualities. We also performed MD simulations to confirm the stability of the ligand-protein complex structures and determine whether the selected compounds are stable at the protein binding site. All 3 phytochemicals, Quercetin (CID: 5280343), Cianidanol (CID: 9064), and Kaempferol (CID: 5280863), appeared to have outstanding binding stability to the target protein than control ribavirin, according to the molecular docking, MM-GBSA, and MD simulation outcomes. Overall, this work offers a viable approach to developing novel medications for treating NiV infection.

Keywords: Nipah virus, in silico drug design, *Azadirachta indica*, molecular docking, post-docking MM-GBSA, ADMET, MD simulation

Citation: Saha, O., Siddiquee, N. H., Akter, R., Sarker, N., Bristi, U. P., Sultana, K. F., ... & Akter, M. S. (2024). Antiviral Activity, Pharmacoinformatics, Molecular Docking, and Dynamics Studies of *Azadirachta indica* Against Nipah Virus by Targeting Envelope Glycoprotein: Emerging Strategies for Developing Antiviral Treatment. *Bioinformatics and Biology Insights*, 18, 11779322241264145. DOI: <https://doi.org/10.1177/11779322241264145>

SCHOLARLY
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Title of the Article: 1

Language ideology, development of English proficiency, and performance in professional communication: voices of STEM+ business graduates of English medium university.

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Abstract

The current study aims at unpacking the language ideologies of the STEM+ Business graduates in relation to English medium instruction (EMI) and how they perceive the contribution of EMI towards English proficiency development. It also intended to unfold the extent to which EMI education may have contributed to their employability and fulfillment of workplace communication needs. Inspired by inadequate evidence on the effect of EMI on English Language Proficiency (ELP) and employability, the researchers engaged with the participants who could draw on their EMI experiences in developing ELP, attaining employability, and fulfilling workplace communication needs in English. Theoretical aspects of language ideologies, ELP, and employability set the conceptual ground of the study. Adopting the interpretive phenomenological approach and harnessing semi-structured interview questions, the study collected data from eight participants. The study found that the language ideologies of the graduates were shaped by the perceived role and importance of English to serve academic and economic purposes through the availability of curriculum corresponding to global standards, access to knowledge, English-oriented atmosphere and ELP development, and EMI policy adoption and implementation in higher education institutions was seen as a panacea to avail the facilities described above. The participants also confirmed that EMI education benefitted their ELP, enabling them to obtain jobs and perform workplace communication in English.

Keywords: English medium instruction (EMI), Language ideology, English language proficiency, Employability, Professional communication, Higher education institutions, Graduates' perspectives

Citation: Karim, A., Islam, M. S., Hamid, M. O., Rahman, M. M., & Amin, E. U. (2023). Language ideology, development of English proficiency, and performance in professional communication: voices of STEM+ business graduates of English medium university. *Asian-Pacific Journal of Second and Foreign Language Education*, 8(1), 27. DOI: <https://doi.org/10.1186/s40862-023-00200-w>

Title of the Article: 2

Pre-service TESOL teachers' professional-awareness building through reflecting on reflections of critical incidents

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Abstract

Scholars have questioned the effectiveness of reflective practice for gaining professional awareness or attaining professional development. In addition, the prevalence of inadequate comprehensive framework for pre-service teachers' reflective practice and insufficient support of teacher educators have been noted in the literature. Against these backdrops, the present study attempted to demonstrate how reflecting on reflections, a form of reflective practice, of Critical Incidents (CIs) contributes to building pre-service TESOL teachers' professional awareness. The study involved ten pre-service teachers (PSTs) in reflecting on reflections of CIs during the teaching practicum. Following the interpretive phenomenological approach, the study unfolded the CIs associated with pedagogical factors, including passive participation of the students, students' late arrival in the classroom, disobedience to teachers' instructions, the chaotic environment in the classroom, students' rude behavior, and disruption caused by technical glitches, and CIs associated with intrapersonal and interpersonal factors, comprising students' emotional exhaustion and unprofessional behaviors by senior teachers. Subsequently, it illustrated how PSTs cultivated their professional awareness through reflecting on reflections of CIs. The study presented a reflective practice framework applicable to pre-service and in-service teacher education programs. It also provided practical suggestions for pre-service and novice teachers to address and overcome the CIs. Teacher educators and trainers can harness the findings to prepare PSTs to conduct interactive and productive English language classes.

Keywords: TESOL education, Reflective practice, Pre-service teachers, ESL, Critical incidents, Reflecting on reflections, Professional awareness, Professional development

Citation: Karim, A., Amin, F., Kabilan, M. K., Reshmin, L., & Amin, E. U. (2024). Pre-service TESOL teachers' professional-awareness building through reflecting on reflections of critical incidents. *Asian-Pacific Journal of Second and Foreign Language Education*, 9(1), 52. DOI: <https://doi.org/10.1186/s40862-024-00254-4>

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Title of the Article: 3

Label-free quantification of gold nanoparticles at the single-cell level using a multi-column convolutional neural network (MC-CNN).

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Abstract

Gold nanoparticles (AuNPs) are extensively used in cellular imaging, single-particle tracking, disease diagnosis, studying membrane protein interaction, and drug delivery. Understanding the dynamics of AuNP uptake in live cells is crucial for optimizing their efficacy and safety. Traditional manual methods for quantifying AuNP uptake are time-consuming and subjective, limiting their scalability and accuracy. The available fluorescence-based techniques are limited to photobleaching and photoblinking. Optical microscopy techniques are limited by diffraction limits. Electron microscopy-based imaging techniques are destructive and unsuitable for live cell imaging. Furthermore,

the resulting images may contain hundreds of particles with varied intensities, blurring, and substantial occlusion, making it difficult to manually quantify AuNP uptake. To overcome this issue and measure AuNP uptake by live cells, we annotated a dataset of dark-field images of 50 nanometer-radius AuNPs at different incubation durations. Then, to count the number of particles present in a cell, we created a customized multi-column convolutional neural network (MC-CNN). The customized MC-CNN outperformed typical particle counting architectures when compared to spectroscopy-based counting. This will allow researchers to gain a better understanding of AuNP behavior and interactions with cells, paving the way for advancements in nanomedicine, drug delivery, and biomedical research. The code for this paper is available at the following link: https://github.com/Namerlight/LabelFree_AuNP_Quantification.

Citation: Mohsin, A. S., & Choudhury, S. H. (2024). Label-free quantification of gold nanoparticles at the single-cell level using a multi-column convolutional neural network (MC-CNN). *Analyst*, 149(8), 2412-2419. DOI: <https://doi.org/10.1039/D3AN01982A>

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Title of the Article: 4

A novel plasmonic MIM sensor using integrated 1×2 demultiplexer for individual lab-on-chip detection of human blood group and diabetes level in the visible to near-infrared region

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Abstract

In this article, we present an innovative plasmonic lab-on-chip (LoC) sensor featuring three ports, utilizing a 1×2 demultiplexer to detect two separate samples without cross-contamination. The performance of the sensor is numerically investigated using the finite element method (FEM), yielding a maximum sensitivity of 865.9 nm per refractive index unit (RIU) and a figure of merit (FOM) of 58.4 in the 700–920 nm range. The proposed metal–insulator–metal (MIM) structure, incorporating a diamond-shaped silicon nanodot array with a perimeter of less than 100 nm, serves as a sensing surface, detecting changes in the refractive index (RI) of the surrounding medium. Our suggested sensor demonstrates an extraordinary transmission coefficient (TC) of around -18 -dB, it surpasses classical optics predictions, and its nanoscale light confinement enhances interaction with analytes. Our LoC sensor, based on the MIM structure, achieves high accuracy and precision in measuring small RI changes, making it portable and suitable for on-site applications, and settings with limited resources. This sensor streamlines medical processes by rapidly detecting blood groups and diabetes levels with minimal sample volume, potentially improving patient care efficiency.

Citation: Rahad, R., Haque, M. A., Faruque, M. O., Mohsin, A. S., Mobassir, M. S., & Sagor, R. H. (2024). A novel plasmonic MIM sensor using integrated 1×2 demultiplexer for individual lab-on-chip detection of human blood group and diabetes level in the visible to near-infrared region. *IEEE Sensors Journal*. DOI: <https://doi.org/10.1109/JSEN.2024.3372692>

Title of the Article: 5

A comprehensive evaluation of solar cell technologies, associated loss mechanisms, and efficiency enhancement strategies for photovoltaic cells.

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Abstract

In-depth assessments of cutting-edge solar cell technologies, emerging materials, loss mechanisms, and performance enhancement techniques are presented in this article. The study covers silicon (Si) and group III–V materials, lead halide perovskites, sustainable chalcogenides, organic photovoltaics, and dye-sensitized solar cells. In this regard, promising architectural advancements with graphene and metamaterials are highlighted. The study also encompasses various types of losses, including intrinsic and extrinsic losses in single-junction solar cells. Additionally, it evaluates efficiency improvement techniques such as light management and spectral utilization. While the efficiency of Si-based solar cells has plateaued around 25%, the efficiency of III–V compound semiconductor-based multi-junction solar cells is increasing. However, the high material cost of III–V compound semiconductors is a drawback. Furthermore, CIGS and CdTe solar cell technologies compete with crystalline solar cells, owing to recent advances in cell performance, however environmental concerns and CdTe solar cells' low open-circuit voltage remain challenges. On the other hand, Perovskite solar cells are extremely efficient in both single and multijunction arrangements. Device deterioration, hysteresis, and film quality are among issues that must be addressed when industrialising perovskite solar cells

Keywords: Photovoltaic cells, Silicon solar cell, Semiconductor solar cell, Novel material based solar cell, Loss mechanism and performance optimization techniques

Citation: Oni, A. M., Mohsin, A. S., Rahman, M. M., & Bhuian, M. B. H. (2024). A comprehensive evaluation of solar cell technologies, associated loss mechanisms, and efficiency enhancement strategies for photovoltaic cells. *Energy Reports*, 11, 3345-3366. DOI: <https://doi.org/10.1016/j.egy.2024.03.007>

Title of the Article: 6

Highly Sensitive Optically Tunable Transition Metal Nitride-Based Plasmonic Pressure Sensor with CMOS-compatibility at Compact Subwavelength Dimensions

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Abstract

This article presents a novel transition metal nitride (TMN)-based plasmonic pressure sensor (PPS) that utilizes a TMN–insulator–TMN structure. Our proposed sensor is built with zirconium nitride (ZrN), an alternative plasmonic material that provides several benefits over conventional plasmonic metals like silver and gold. Notably, ZrN is compatible with standard complementary metal oxide semiconductor (CMOS) technology and it offers tunability of optical properties. The sensor demonstrates a maximum pressure sensitivity of 177.56 nm/MPa with a resolution of 5.63×10^{-6} MPa. Furthermore, the incorporation of TMN endows the PPS with several beneficial characteristics, such as exceptional hardness, high-temperature thermal stability, optical tunability, and lower electrical resistivity which are typically absent in conventional plasmonic noble metals, limiting their practical application in plasmonic devices. Consequently, our proposed configuration outperforms the conventional noble material-based metal–insulator–metal (MIM) configuration, which removes the barriers to wide-scale adaptations of plasmonic devices by paving the way for the research and development of efficient, robust, and long-lasting sensors at subwavelength scales, thereby forging a link between nanoelectronics and plasmonics.

Keywords: Complementary metal oxide semiconductor (CMOS) compatibility, metal–insulator–metal (MIM), pressure sensing, surface plasmon polariton.

Citation: Rahad, R., Haque, M. A., Mahadi, M. K., Mohsin, A. S., Faruque, M. O., Afrid, S. M. T. S., ... & Sagor, R. H. (2024). Highly sensitive optically tunable transition metal nitride-based plasmonic pressure sensor with CMOS-compatibility at compact subwavelength dimensions. *IEEE Sensors Journal*, 24(14), 2271-2278, DOI: <https://doi.org/10.1109/JSEN.2024.3404479>

Title of the Article: 7

Designing and development of agricultural rovers for vegetable harvesting and soil analysis

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Abstract

To address the growing demand for sustainable agriculture practices, new technologies to boost crop productivity and soil health must be developed. In this research, we propose designing and building an agricultural rover capable of autonomous vegetable harvesting and soil analysis utilizing cutting-edge deep learning algorithms (YOLOv5). The precision and recall score of the model was 0.8518% and 0.7624% respectively. The rover uses robotics, computer

vision, and soil sensing technology to perform accurate and efficient agricultural tasks. We go over the rover's hardware and software, as well as the soil analysis system and the tomato ripeness detection system using deep learning models. Field experiments indicate that this agricultural rover is effective and promising for improving crop management and soil monitoring in modern agriculture, hence achieving the UN's SDG 2 Zero Hunger goals.

Citation: Das, B., Sayor, T. Z. U. H., Nijhum, R. J., Tishun, M. T., Sakib, T. H., Karim, M. E., ... & Mohsin, A. S. (2024). Designing and development of agricultural rovers for vegetable harvesting and soil analysis. *Plos one*, 19(6), e0304657. DOI: <https://doi.org/10.1371/journal.pone.0304657>

Title of the Article: 8

Recent advances in the metamaterial and metasurface-based biosensor in the gigahertz, terahertz, and optical frequency domain

Authors and Affiliations:

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Abstract

Recently, metamaterials and metasurface have gained rapidly increasing attention from researchers due to their extraordinary optical and electrical properties. Metamaterials are described as artificially defined periodic structures exhibiting negative permittivity and permeability simultaneously. Whereas metasurfaces are the 2D analogue of metamaterials in the sense that they have a small but not insignificant depth. Because of their high optical confinement and adjustable optical resonances, these artificially engineered materials appear as a viable photonic platform for biosensing applications. This review paper discusses the recent development of metamaterial and metasurface in biosensing applications based on the gigahertz, terahertz, and optical frequency domains encompassing the whole electromagnetic spectrum. Overlapping features such as material selection, structure, and physical mechanisms were considered during the classification of our biosensing applications. Metamaterials and metasurfaces working in the GHz range provide prospects for better sensing of biological samples, THz frequencies, falling between GHz and optical frequencies, provide unique characteristics for biosensing permitting the exact characterization of molecular vibrations, with an emphasis on molecular identification, label-free analysis, and imaging of biological materials. Optical frequencies on the other hand cover the visible and near-infrared regions, allowing fine regulation of light-matter interactions enabling metamaterials and metasurfaces to offer excellent sensitivity and specificity in biosensing. The outcome of the sensor's sensitivity to an electric or magnetic field and the resonance frequency are, in theory, determined by the frequency domain and features. Finally, the challenges and possible future perspectives in biosensing application areas have been presented that use metamaterials and metasurfaces across diverse frequency domains to improve sensitivity, specificity, and selectivity in biosensing applications.

Keywords: Metamaterials, Metasurface, Frequency domain, Sensor configuration, Biosensing

Citation: Shamim, S., Mohsin, A. S., Rahman, M. M., & Bhuian, M. B. H. (2024). Recent advances in the metamaterial and metasurface-based biosensor in the gigahertz, terahertz, and optical frequency domains. *Heliyon*, 10(13), e33272. DOI: <https://doi.org/10.1016/j.heliyon.2024.e33272>

Title of the Article: 9

Nanohole array integrated metal insulator metal (MIM) based structure employing dual mode SPR sensor for detection of Hemoglobin (Hb) in blood

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Abstract

Surface Plasmon Resonance (SPR) based optical biosensors are recently the most attractive sensing devices that can detect minor changes in refractive index. Multiple methods have been developed to design SPR based biosensors with high-performance and ease of fabrication. This research is about a grating based biosensor that utilizes Silver (Ag) and Titanium (Ti) to produce the SP resonance state. The structure has a resonance wavelength, which displays sensitivity to changes in the surrounding medium of the refractive index. The study has been conducted using numerical simulations, utilizing the finite-difference-time-domain (FDTD) method. The simulation results shows a sharp resonance peaks in the wavelength range of 450–700 nm with a remarkable sensitivity of 172 nm/RIU (for mode 1 at SPR peak 465 nm) and 515 nm/RIU (for mode 2 at SPR peak 585 nm), which is superior to other on-chip device. The investigation involves a comparative analysis of sensing performance, focusing on parameters like transmission, reflection, FWHM and Quality factor to measure the detection accuracy of the proposed material combination. Later, we employed this miniature biosensor device to detect hemoglobin concentrations in the blood. Our findings indicate that this developed structure has great potential for detecting any biomolecule, such as proteins, glucose, fructose, nucleic acids, and cells.

Keywords: SPR biosensor Silver (Ag) Titanium (Ti) Hemoglobin and sensitivity

Citation: Tasnim, N., & Mohsin, A. S. (2024). Nanohole array integrated metal insulator metal (MIM) based structure employing dual mode SPR sensor for detection of Hemoglobin (Hb) in blood. *Helicon*, 10(12), e33445. DOI: <https://doi.org/10.1016/j.helicon.2024.e33445>

Title of the Article: 10

Design optimization and validation of UV-C Illumination chamber for filtering facepiece respirator

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Abstract

In this study, we constructed an UV-C illumination chamber using commercially available germicidal lamps and other locally available low-cost components for general-purpose biological decontamination purposes. The illumination chamber provides uniform illumination of around 1 J/cm² in under 5 min across the chamber. The control mechanism was developed to automate the on/off process and make it more secure minimizing health and other electrical safety. To validate the decontamination efficacy of the UV-C Illumination Chamber we performed the *Geobacillus* spore

strip culture assay. Additionally, we performed the viral load measurement by identifying the COVID-19-specific N-gene and ORF1 gene on surgical masks. The gold standard RT-qPCR measurement was performed to detect and quantify the COVID-19-specific gene on the mask sample. The biochemical assay was conducted on the control and test group to identify the presence of different types of bacteria, and fungi before and after exposure under the illumination chamber. The findings of our study revealed satisfactory decontamination efficacy test results. Therefore, it could be an excellent device in healthcare settings as a disinfection tool for biological decontamination such as SAR-CoV-2 virus, personal protection equipment (PPE), (including n95, k95 respirators, and surgical masks), and other common pathogens.

Keywords: UV-C illumination chamber, SAR-CoV-2 virus, Facepiece respirators, Personal protection equipment (PPE), Decontamination efficacy, Biological decontamination and pathogens

Citation: Mohsin, A. S., Jamiruddin, M. R., Peyal, M. M. K., Sharmin, S., Ahmed, A., Puspita, A. H., ... & Kabir, E. R. (2024). Design optimization and validation of UV-C illumination chamber for filtering facepiece respirators. *Heliyon*, 10(5), e26348. <https://doi.org/10.1016/j.heliyon.2024.e26348>

Title of the Article: 11

Label-free biosensor on chip (BoC) based on localized surface plasmon resonance for monitoring temperature and blood hemoglobin concentration

Authors and Affiliations:

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Abstract

On-chip localized surface plasmon resonance (LSPR) biosensor on chip (BoC) is a type of label-free biosensor that utilizes the plasmonic resonances of metal nanostructures to detect changes in the refractive index of the local environment. This results in changes in the intensity and wavelength of the surface plasmon resonance, which can be used to quantify the presence and concentration of biomolecules such as proteins, nucleic acids, and cells. In this paper, we propose a novel on-chip device with a microfluidic channel that contains the biological fluid under test. We have obtained sharp resonance peaks in the wavelength range between 700–800 nm with a sensitivity of 509 nm R–1IU–1 which is good compared to other on-chip devices. The main advantage of our design is the less complex manufacturing process compared to other BoCs. Our design consists of a central cavity that is surrounded by silver and consists of rectangular pillar-shaped silver particles placed in the cavity. Two very promising applications of this device are label-free temperature sensing and blood hemoglobin (Hb) concentration sensing with a resolution of 0.222 nm/°C for temperature and 1.34 nm/(g/dL) for Hb. However, it can be used for any kind of sensing application that involves refractive index changes as the sensing platform.

Keywords: LSPR based biosensor, biosensor on Chip (BoC), hemoglobin and temperature monitoring

Citation: Mondal, S., Mohsin, A. S., Bhuian, M. B. H., Rahman, M. M., & Rahad, R. (2024). Label-free biosensor on chip (BoC) based on localized surface plasmon resonance for monitoring temperature and blood hemoglobin concentration. *Physica Scripta*, 99(4), 045030. DOI: <https://doi.org/10.1088/1402-4896/ad3513>

Title of the Article: 12

Working capital management and firm performance: A comparative analysis of developed and emerging economies

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Abstract

The literature on working capital management (WCM) provides mixed evidence on the effect of working capital on firm profitability and performance. We use firms from developed and emerging economies to explore how working capital and its components relate to firms' performance while controlling for firm-specific and macroeconomic factors. The findings show that the cash conversion cycle (CCC) is inversely related to firm performance in developed and emerging economies—however, there are differences in the CCC's components. While firms in developed economies exhibit higher firm performance with longer days' inventory on hand, firms in emerging economies have lower firm performance with longer days' inventory on hand, extended collection periods, and longer payable periods. Company-specific factors, such as firm size, growth, profitability, and leverage, influence the efficiency of WCM. We also find that country-specific variables such as gross domestic product (GDP), interest rate, and inflation have varying impacts on a firm's WCM.

Keywords: Working capital management, Cash conversion cycle, Firm performance, Developed and emerging economies

Citation: Kiymaz, H., Haque, S., & Choudhury, A. A. (2024). Working capital management and firm performance: A comparative analysis of developed and emerging economies. *Borsa Istanbul Review*, 24(3), 634-642. DOI: <https://doi.org/10.1016/j.bir.2024.03.004>

Title of the Article: 13

Perceptions and attitudes of Rohingya community stakeholders to pregnancy termination services: a qualitative study in camps of Cox's Bazar, Bangladesh

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Abstract

Background

Rohingya women suffer from inaccessibility to sexual and reproductive health services in Myanmar. After the forcible displacement of the Rohingya from Myanmar to Bangladesh in 2017, pregnancy termination services have been increasingly important and desired, while knowledge gaps and obstacles to access services still exist. The role of community stakeholders is critical as gatekeepers and decision-makers to improve and strengthen pregnancy termination services for women in camps. However, there is paucity of evidence on their perspectives about pregnancy termination. This qualitative study aims to understand the perception and attitudes of Rohingya community stakeholders to pregnancy termination in the camps of Cox's Bazar.

Methods: We used purposive sampling to select 48 participants from the community stakeholders, 12 from each group: majhis (Rohingya leaders), imams (religious leaders), school teachers, and married men. We conducted in-depth interviews of all the participants between May-June 2022 and October-November 2022. Data were coded on Atlas.ti and analysed using a thematic content analysis approach.

Results: Multiple socio-cultural and religious factors, gendered norms and stigma associated with pregnancy termination acted as barriers to women seeking services for it. From a religious stance, there was greater acceptance of pregnancy termination in the earlier period than in the later period of pregnancy. We observed that pregnancy termination among community stakeholders in earlier stages of pregnancy than later. However, circumstances, such as a woman's marital status, whether she sought her husband's permission or her ability of childcare capacity, were often framed by community stakeholders as 'acceptable' for pregnancy termination. Health concerns and social and contextual factors can influence community stakeholders supporting pregnancy termination.

Conclusions: The community stakeholders perspectives on barriers and enablers of pregnancy termination were variable with the context. These perspectives may support or impede women's ability to choice to seek pregnancy termination services. To improve women's choice to pregnancy termination, it is critical to consider roles of community stakeholders in creating their supporting attitudes to women's choice and access, and to designing targeted culturally appropriate interventions with communities support and engagement.

Keywords: Rohingya, Pregnancy termination, Abortion care, Menstrual regulation, Bangladesh

Citation: Rahman, A., Strong, J., Mondal, P. P., Maynard, A., Haque, T., Moore, A. M., & Afsana, K. (2024). Perceptions and attitudes of Rohingya community stakeholders to pregnancy termination services: a qualitative study in camps of Cox's Bazar, Bangladesh. *Conflict and Health*, 18(1), 19. DOI: <https://doi.org/10.1186/s13031-024-00574-9>

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Title of the Article: 14

Graphene-Metamaterial Based Tunable Broadband Polarization Insensitive Absorber for Terahertz Antenna Design

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Abstract

The advent of graphene has opened new avenues for the design of high-performance metamaterial devices, particularly in the realm of electromagnetic absorption applications. This paper introduces a novel design for a broadband tunable graphene metamaterial absorber (GMMA) utilizing graphene. Through numerical simulations, our proposed GMMA demonstrates an absorption bandwidth of 3 THz (1.14 – 4.14 THz) with absorptivity exceeding 90% for both transverse magnetic (TM) and transverse electric (TE) modes. A comprehensive numerical analysis, using a transmission line equivalent circuit model, has been proposed to find out the impedance components of all the corresponding layers, which can be significant to determine the impedance matching. The absorber exhibits wideband tunability, polarization insensitivity, and robust tolerance to structural variations, making it a promising candidate for diverse applications in the terahertz (THz) band especially in the antenna regime. Our proposed GMMA antenna

can achieve a gain of 37.48 dB, a directivity of 32.81 dB, a return loss of -34 dB, and an efficiency of 99.96%. This research provides a valuable contribution to the development of tunable broadband GMMAs for THz frequencies, addressing the increasing demand for high-speed and efficient devices in the modern era of science and technology.

Keywords: Graphene-metamaterial absorber, terahertz antenna, absorptivity, bandwidth, gain, directivity, efficiency.

Citation: Rahad, R., Mohsin, A. S., Bhuian, M. B. H., & Rahman, M. M. (2024). Graphene-metamaterial based tunable broadband polarization insensitive absorber for terahertz antenna design. *Ieee Access*, 12, 48654-48667. DOI: <https://doi.org/10.1109/ACCESS.2024.3382713>

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Title of the Article: 15

Bacteriological analysis and antibiotic resistance in patients with diabetic foot ulcers in Dhaka

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Abstract

The primary objective of this study was to isolate bacteria from diabetic foot ulcers and subsequently assess their antibiotic resistance capabilities. Seventy-five patients diagnosed with diabetic foot ulcers were investigated. A number of these patients (97.33%) had type 2 diabetes, with a significant proportion of them having been diagnosed for 1–5 years (29.33%). Notably, a substantial number of these individuals were on insulin usage (78.66%). Among the patients under examination, 49.33% reported having no use of tobacco products, alcohol, or betel leaf. The ulcers analyzed in this study were classified into grades 1–5 according to the Wagner scale. Wagner grade 2 diabetic foot ulcers had the highest number of culture-positive patients, at 33.33%. Pus samples collected from patients were cultured on selective media, and bacterial identity was confirmed by biochemical tests and polymerase chain reaction. A total of 141 isolates were isolated. Among the isolates, 82.97% gram-negative bacteria and 17.02% gram-positive bacteria were detected. *Klebsiella pneumoniae* was the most common isolate. *Proteus* spp., *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus* were also detected. Approximately 61.33% of the ulcers exhibited were polybacterial. In this study, it was observed that all bacterial isolates, except for *Proteus* spp., were primarily detected in patients classified under Wagner's grade 2. Moreover, antibiotic susceptibility was also tested on these 141 isolates. Among them, *Escherichia coli* showed the highest multidrug resistance, 81.81%. Most of the gram-negative bacteria were resistant to ampicillin. All of the gram-negative isolates exhibited high levels of susceptibility to piperacillin-tazobactam, and these levels were *Klebsiella pneumoniae* (97.56%), *Pseudomonas aeruginosa* (95.24%), *Escherichia coli* (81.82%), and *Proteus* spp. (80%). On the other hand, gram-positive *Staphylococcus aureus* mostly showed sensitivity towards vancomycin and norfloxacin (79.17%).

Citation: Baral, P., Afnan, N., Ahmad Zahra, M., Akter, B., Rabia Prapti, S., Muazzam Hossan, M., & Haque, F. K. M. (2024). Bacteriological analysis and antibiotic resistance in patients with diabetic foot ulcers in Dhaka. *Plos one*, 19(5), e0301767.

Title of the Article: 16

Environmental, social and governance (ESG) rating prediction using machine learning approaches.

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Abstract

The study's objective is to predict the environmental, social, and governance (ESG) ratings of firms. Applying six machine learning algorithms, we collect a global data sample of 6166 firms in 73 countries from 2005 to 2019. We use firm-specific and macroeconomic predictors in the model and find that Random Forest Classifier provides the highest accuracy (78.50%) among the six machine learning algorithms by considering Kappa, area under the curve, receiver operating characteristic, and logLoss. The variable importance factor reveals that the lagged ESG score has the highest contribution to the model. Firm size has the second highest, and debt to equity ratio has the third-highest contribution, which indicates that a firm's total assets and a firm's financial leverage impact the ESG rating. In addition to a contribution to the growing body of ESG literature, the study's findings can help practitioners, firm regulators, and policymakers in social and environment-friendly decision-making and investors in investment decisions.

Keywords: ESG, Corporate social performance, Environmental, social and governance, Machine learning, Random forest

Citation: Chowdhury, M. A. F., Abdullah, M., Azad, M. A. K., Sulong, Z., & Islam, M. N. (2023). Environmental, social and governance (ESG) rating prediction using machine learning approaches. *Annals of Operations Research*, 1-25. DOI: <https://doi.org/10.1007/s10479-023-05633-7>

Title of the Article: 17

Do Islamic banks use institutional theory in the light of Shariah governance? Empirical evidence from a Muslim dominant country

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Abstract

The present paper examines the application of institutional theory (hereafter IT) mechanisms (isomorphism and legitimacy) in Shariah governance (henceforth SG) practices and in operations, as it best illuminates the operational guidelines and procedures for the Islamic banks to attain legitimacy. More specifically, the study aims to empirically

explore the SG of Islamic banks in Bangladesh from the viewpoint of IT mechanisms. The study applied a qualitative case study method and a semi-structured face-to-face (individual) interview with various stakeholders connected with Bangladesh's Islamic banks and SG practices. The study finds that Islamic banks face pressure from the administration, regulators, and government in performing their activities and functions. More importantly, most Islamic banks replicate one leading Islamic bank, which indicates the presence of mimetic or cultural-cognitive isomorphism. Conversely, normative pressure covers the existing practicing environment, people's social awareness, knowledge, willingness, and accountability of the Board of Directors (BOD) towards the people concerning Shariah compliance with policymaking. Moreover, socio-political norms, regulations, and corruption influenced policymaking, preparation of SG guidelines, and their implementation. The study significantly contributed to national regulatory bodies by exploring the presence of significant pressures on diverse stakeholders. The study has several policy contributions for the Islamic banks and the Central Bank of Bangladesh. Notably, the study will help global regulatory bodies and policymakers minimize multifaceted pressures, improve SG practices, and enhance the quality of Shariah compliance.

Keywords: Institutional theory Shariah governance Islamic banks Developing country

Citation: Alam, M. K., & Miah, M. S. (2024). Do Islamic banks use institutional theory in the light of Shariah governance? Empirical evidence from a Muslim dominant country. *Heliyon*, 10 (2), e24252. DOI: <https://doi.org/10.1016/j.heliyon.2024.e24252>

Title of the Article: 18

The Relationship between Goodwill and Capital Structure and the Moderating Effect of Financial Market Development

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Abstract

Purpose – This study empirically investigates the relationship between goodwill assets and capital structure (i.e. debt ratio) of firms and the moderating effect of financial market development on the relationship between goodwill assets and capital structure.

Design/methodology/approach – This research applied a quantitative method. The article collects large samples of listed firms from 23 developing and nine developed countries and applied the panel data techniques. This research used firm-level data from the DataStream database for both developed and developing countries. The study uses 4,912 firm-level data from 23 developing countries and 4,303 firm-level data from nine developed countries.

Findings – The findings reveal a significant positive relationship between goodwill assets and capital structure in developing countries, but goodwill assets have a significant negative relationship with capital structure in developed

countries. Moreover, financial market development positively moderates the relationship between goodwill assets and the capital structure of firms in developing countries. The results inform firm managers that goodwill assets serve as additional collateral to secure debt financing. Moreover, policymakers should formulate a debt market policy that recognizes goodwill assets as additional collateral for the purpose of obtaining debt capital.

Research limitations/implications – The study has several implications. First, goodwill assets are identified as a factor of capital structure in this study. Fixed assets have been identified as one of the drivers of capital structure in previous research, although goodwill assets are seldom included. Second, this article shows that along with demand-side determinants, supply-side determinants also play an important role in terms of the firms' choice about the capital structure. Therefore, firms should take both the demand-side and supply-side factors into consideration when sourcing for external financing (i.e. debt capital).

Originality/value – The study considered goodwill as a component of capital structure. The study analysis includes a large sample of enterprises, including 4,912 big firms from 23 developing countries and 4,303 large firms from nine industrialized or developed countries, which adds to the current capital structure information. Furthermore, a large sample size increases the results' robustness and generalizability.

Keywords: Capital structure, Goodwill, Information asymmetry, Financial market development, Panel data analysis

Paper type: Research paper

Citation: Thakur, O. A., Tunde, M. B., Noordin, B. A. A., Alam, M. K., & Prabowo, M. A. (2024). The relationship between goodwill and capital structure and the moderating effect of financial market development. *Journal of Economics, Finance and Administrative Science*, 29(57), 121-145. DOI: <https://doi.org/10.1108/JEFAS-04-2022-0107>

Title of the Article: 19

Altered serum TNF- α and MCP-4 levels are associated with the pathophysiology of major depressive disorder: A case-control study results

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Abstract

Background: Major Depressive Disorder (MDD) is a debilitating mental health condition with complex etiology, and recent research has focused on pro-inflammatory cytokines and chemokines as potential contributors to its pathogenesis. However, studies investigating the roles of TNF- α and MCP-4 in MDD within the Bangladeshi population are scarce. This study aimed to assess the association between serum TNF- α and MCP-4 levels and the severity of MDD, exploring their potential as risk indicators for MDD development.

Methods: This case-control study enrolled 58 MDD patients from Bangabandhu Sheikh Mujib Medical University

(BSMMU) Hospital, Dhaka, Bangladesh, alongside 30 age, sex, and BMI-matched healthy controls. MDD diagnosis followed DSM-5 criteria and disease severity using the 17-item Hamilton Depression Rating Scale (Ham-D). We measured serum TNF- α and MCP-4 levels using ELISA assays according to the supplied protocols.

Results: The study revealed significantly elevated serum TNF- α levels in MDD patients (47 ± 6.6 pg/ml, mean $\pm$ SEM) compared to controls (28.06 ± 1.07 pg/ml). These increased TNF- α levels positively correlated with Ham-D scores (Pearson's $r = 0.300$, $p = 0.038$), suggesting a potential association between peripheral TNF- α levels and MDD pathology. Additionally, MDD patients exhibited significantly higher serum MCP-4 levels (70.49 ± 6.45 pg/ml) than controls (40.21 ± 4.08 pg/ml). However, serum MCP-4 levels showed a significant negative correlation ($r = -0.270$, $P = 0.048$) with Ham-D scores in MDD patients, indicating a more complex role for MCP-4 in MDD pathogenesis.

Conclusion: This study highlights that Bangladeshi MDD patients exhibit heightened inflammatory and immune responses compared to controls, supporting the cytokine hypothesis in MDD pathogenesis. Serum TNF- α , but not MCP-4, shows promise as a potential biomarker for assessing the risk of MDD development, which could aid in early detection. Future investigations involving larger populations and longitudinal studies are essential to confirm the utility of these cytokines as biomarkers for MDD.

Citation: Nayem, J., Sarker, R., Roknuzzaman, A. S. M., Qusar, M. S., Raihan, S. Z., Islam, M. R., & Mahmud, Z. A. (2023). Altered serum TNF- α and MCP-4 levels are associated with the pathophysiology of major depressive disorder: A case-control study results. *PLoS One*, 18(11), e0294288. DOI: <https://doi.org/10.1371/journal.pone.0294288>

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Title of the Article: 20

Evaluation of serum MIP-1 β and MCP-2 levels in major depressive disorder: A case-control study

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Abstract

Background: Major depressive disorder (MDD) is a common and debilitating mental illness characterized by persistent feelings of sadness, hopelessness, and a lack of interest in daily activities. The objective of this study was to investigate whether levels of macrophage inflammatory protein-1 β (MIP-1 β) and macrophage chemoattractant protein-2 (MCP-2) in the blood were associated with the pathophysiology and development of MDD compared to healthy controls (HCs).

Methods: This case-control study was conducted involving 50 MDD patients and 38 HCs. We performed a comprehensive assessment to match age, sex, BMI, and socio-demographic profile between the groups. The study excluded participants with chronic infection, inflammatory diseases, coexisting psychiatric disorder, history of liver

and kidney diseases, and individuals who are under antipsychotic medications. A professional psychiatrist diagnosed MDD patients and evaluated HCs based on the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5) criteria. The severity of depression was assessed using the Hamilton Depression (Ham-D) rating scale. Commercially available enzyme-linked immunosorbent assay (ELISA) kits were used to quantify the serum MIP-1 β and MCP-2 levels.

Results: The results indicated elevated serum MIP-1 β levels (207.73 ± 24.24 pg/ml) in MDD patients compared to HCs (58.77 ± 9.14 pg/ml). This difference in concentration is positively correlated with severity of disease symptoms ($r = 0.451$; $p < 0.001$). Similarly, the levels of MCP-2 were found to be elevated in patients compared to controls (143.61 ± 19.92 vs. 56.84 ± 4.02 pg/ml; $p = 0.003$), with a positive correlation with the Ham-D scores ($r = 0.373$; $p = 0.004$).

Conclusion: According to this study, elevated levels of MIP-1 β and MCP-2 may be associated with the pathophysiology and development of MDD. These increased serum MIP-1 β and MCP-2 levels could be used as risk assessment tools for MDD. The present findings urge further research and the development of therapeutic and diagnostic approaches for depression.

Citation: Akter, M., Roknuzzaman, A. S. M., Shahriar, M., Islam, S. M. A., Ahmed Bhuiyan, M., Qusar, M. S., ... & Islam, R. (2024). Evaluation of serum MIP-1 β and MCP-2 levels in major depressive disorder: A case-control study. *Plos one*, 19(6), e0305734. DOI: <https://doi.org/10.1371/journal.pone.0305734>

Title of the Article: 21

Exploring the role of interleukin-1 β and interleukin-6 in the pathophysiology of obsessive-compulsive disorder

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Abstract

Background: Obsessive-compulsive disorder (OCD) is a highly prevalent neuropsychiatric disorder. Recently, there has been a growing interest in investigating the association between pro-inflammatory cytokines and the pathogenesis of OCD. However, studies targeting interleukin-1 β (IL-1 β) and interleukin-6 (IL-6) in OCD are limited. Therefore, the present study aimed to explore the potential role of pro-inflammatory cytokines IL-1 β and IL-6 in the pathophysiology and development of OCD.

Methods: This study recruited 58 OCD patients and 30 age-sex-matched healthy controls (HCs). A qualified psychiatrist diagnosed OCD patients and assessed HCs based on the Diagnostic and Statistical Manual for Mental Health Disorders, 5th edition (DSM-5) criteria. We measured the severity of OCD using the Yale-Brown Obsessive Compulsive Scale (Y-BOCS). Serum IL-1 β and IL-6 levels were measured using ELISA kits following the appropriate methods.

Results: The results showed that serum IL-1 β levels were significantly elevated in OCD patients compared to HCs (23.68 $\pm$ 1.65 pg/ml vs. 15.75 $\pm$ 1.02 pg/ml; $p = 0.002$). Similarly, OCD patients exhibited significantly higher serum IL-6 levels than HCs (44.97 $\pm$ 0.73 pg/ml vs. 37.04 $\pm$ 0.35 pg/ml; $p < 0.001$). We observed both cytokines were positively correlated with the Y-BOCS scores in OCD patients (IL-1 β : $r = 0.380$, $p = 0.015$; IL-6: $r = 0.324$, $p = 0.026$) which indicates their role in disease pathophysiology.

Conclusion: These results suggest that serum IL-1 β and IL-6 levels may be associated with the pathophysiology of OCD. Also, these cytokines levels in blood samples can serve as early risk assessment tools for the development of OCD. We recommend further studies in a large and homogeneous population to support these findings.

Citation: Sarmin, N., Roknuzzaman, A. S. M., Sarker, R., Rashid, M. O., Hasan, A., Qusar, M. S., ... & Mahmud, Z. A. (2024). Exploring the role of interleukin-1 β and interleukin-6 in the pathophysiology of obsessive-compulsive disorder. *Plos one*, 19(6), e0306125. DOI: <https://doi.org/10.1371/journal.pone.0306125>

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Title of the Article: 22

Knowledge, attitude and practices towards SARS-CoV-2 genetic mutations and emerging variants among the population in Bangladesh: a cross-sectional study

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Abstract

Objectives: The coronavirus is continuously mutating and creating new SARS-CoV-2 variants. Public awareness about SARS-CoV-2 mutation is essential for effective preventive measures. The present study aimed to assess the knowledge, attitude and practices (KAP) towards SARS-CoV-2 variants among the general population in Bangladesh.

Design: We conducted this online survey between 9 April 2021 and 10 May 2021 using structured questionnaires to collect the information.

Setting: We distributed the survey link among the participants from all 64 districts of Bangladesh using social media platforms.

Participants: A total of 1,090 respondents completed this survey. After careful evaluation, we excluded 18 responses due to partial or incomplete information, and 1,072 responses entered into the final analysis.

Primary outcome: The KAP of participants towards SARS-CoV-2 variants depends on their demographic backgrounds. Associations between demographic characteristics and the likelihood of having adequate KAP were estimated using adjusted logistic regressions.

Results: Among the participants, 42% had a poor knowledge level, 4% had a low attitude level and 14% had a poor practice score. The average knowledge, attitude and practice score were 2.65, 4.194 and 4.464 on a scale of 5, respectively. Only 51.8% of the participants knew about mutant strains, and only 47.6% knew about the effectiveness of vaccines against new variants. The key factors associated with poor knowledge levels were educational levels, area of residence, geographic location, and concern regarding COVID-19. Sociodemographic factors for poor attitude levels were geographic location, vaccination and concern regarding COVID-19. The pivotal factors in determining poor practice scores were the residence area of people and concern regarding COVID-19.

Conclusions: The knowledge level and positive attitude are associated with better preventive measures against SARS-CoV-2 variants. Based on these findings, we recommended several awareness programmes on SARS-CoV-2 mutations and variants for the rural population in Bangladesh to increase overall awareness levels.

Citation: Ahmed, I., Ether, S. A., Saha, P., Jahan, N., Rahman, F. I., & Islam, M. R. (2023). Knowledge, attitude and practices towards SARS-CoV-2 genetic mutations and emerging variants among the population in Bangladesh: a cross-sectional study. *BMJ open*, 13(11), e073091. DOI: <https://doi.org/10.1136/bmjopen-2023-073091>

Title of the Article: 23

Phenolic compounds of Theobroma cacao L. show potential against dengue RdRp protease enzyme inhibition by In-silico docking, DFT study, MD simulation and MMGBSA calculation

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Background: Currently, there is no antiviral medication for dengue, a potentially fatal tropical infectious illness spread by two mosquito species, *Aedes aegypti* and *Aedes albopictus*. The RdRp protease of dengue virus is a potential therapeutic target. This study focused on the in silico drug discovery of RdRp protease inhibitors.

Methods: To assess the potential inhibitory activity of 29 phenolic acids from *Theobroma cacao* L. against DENV3-NS5 RdRp, a range of computational methods were employed. These included docking, drug-likeness analysis, ADMET prediction, density functional theory (DFT) calculations, and molecular dynamics (MD) simulations. The

aim of these studies was to confirm the stability of the ligand-protein complex and the binding pose identified during the docking experiment.

Results: Twenty-one compounds were found to have possible inhibitory activities against DENV according to the docking data, and they had a binding affinity of ≥ -37.417 kcal/mol for DENV3- enzyme as compared to the reference compound panduratin A. Additionally, the drug-likeness investigation produced four hit compounds that were subjected to ADMET screening to obtain the lead compound, catechin. Based on ELUMO, EHOMO, and band energy gap, the DFT calculations showed strong electronegativity, favourable global softness and chemical reactivity with considerable intra-molecular charge transfer between electron-donor to electron-acceptor groups for catechin. The MD simulation result also demonstrated favourable RMSD, RMSF, SASA and H-bonds in at the binding pocket of DENV3-NS5 RdRp for catechin as compared to panduratin A.

Conclusion: According to the present findings, catechin showed high binding affinity and sufficient drug-like properties with the appropriate ADMET profiles. Moreover, DFT and MD studies further supported the drug-like action of catechin as a potential therapeutic candidate. Therefore, further in vitro and in vivo research on cocoa and its phytochemical catechin should be taken into consideration to develop as a potential DENV inhibitor.

Citation: Huq, A. M., Roney, M., Dubey, A., Nasir, M. H., Tufail, A., Aluwi, M. F. F. M., ... & Tajuddin, S. N. (2024). Phenolic compounds of Theobroma cacao L. show potential against dengue RdRp protease enzyme inhibition by In-silico docking, DFT study, MD simulation and MMGBSA calculation. *Plos one*, 19(3), e0299238. DOI: <https://doi.org/10.1371/journal.pone.0299238>

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Title of the Article: 24

Experimental investigation on extrinsic size effect in micro-orthogonal cutting of commercial aluminium alloy

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Abstract

The achievable precision in micro-machining is constrained by a phenomenon known as the size effect. The edge radius of the tool significantly influences the size effect leading to non-proportional scaling of process performance. The process becomes unscalable below a certain ratio of uncut chip thickness to edge radius termed as critical relative tool sharpness (RTS). Despite extensive studies on the size effect associated with non-linear process performance, very limited studies have focused on the critical RTS range. In the present study, orthogonal cutting experiments were conducted on a commercial aluminium alloy (Al6060) with different cutting-edge radiuses in the RTS range of 0.5 to 0.01. Extensive analysis of the morphology of the chips and tool-work material adherence has been carried out and correlated with the observed size effect on surface integrity. One of the key findings in this study was the size effect in the chips with respect to the chip curl radius and pitch. Between RTS 0.5 and 0.09, an increase in chip curl and pitch is observed, followed by a sharp fall up to RTS 0.07. In addition, another notable phenomenon was the formation of dual-layered chips with deformed layer on the rake side and lamellae like features on the free side. Furthermore, size effect was observed in surface roughness, surface hardness and flank adherence. In summary, the present investigation offers a comprehensive understanding of the size effect within the critical RTS range elucidating

its multifaceted impact on micro-cutting.

Keywords: Edge radius, Size effect, Chip curl, Flank material adherence, Surface roughness, Surface hardness

Citation: Ellappan, S., Ahmed, A., & Rahman, M. A. (2024). Experimental investigation on extrinsic size effect in micro-orthogonal cutting of commercial aluminium alloy. *Precision Engineering*, 88, 915-926. DOI: <https://doi.org/10.1016/j.precisioneng.2024.05.009>

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Title of the Article: 25

A systematic literature review on vlog marketing: thematic analysis and future research directions

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Abstract

Purpose – The aim of this study was to conduct a systematic literature review (SLR) on vlog marketing. The focus was to analyse the major themes in this field and provide insights for future research directions.

Design/methodology/approach – The authors reviewed a total of 49 peer-reviewed publications that include the search terms “vlog” or “video blog” in their titles, keywords and abstracts, retrieved from digital databases Scopus and Web of Science, up to the end of July 2023. Thematic analysis was used to examine and synthesise the articles.

Findings – The authors found 19 sub-themes and identified four major themes that emerged from the literature: (1) endorsement outcomes, (2) vlogger characteristics, (3) consumer credibility and (4) vlog content crafting.

Originality/value – There are many unanswered questions in the literature, suggesting that vlog marketing research is still in its infancy, and that in-depth further studies are required for a more comprehensive understanding of the field. This study has identified potential avenues for future research that may contribute to the existing body of knowledge and valuable insights on vlog marketing.

Keywords: Vlog marketing, Thematic analysis, Systematic literature review

Paper type: Literature review

Citation: Zhang, P., Hasan, N., Chiong, R., & Chao, C. W. (2024). A systematic literature review on vlog marketing: thematic analysis and future research directions. *Asia Pacific Journal of Marketing and Logistics*, 36(6), 1538-1555. DOI: <https://doi.org/10.1108/APJML-10-2023-0994>

Title of the Article: 26

Impact of internal identity asymmetry on employee's behaviors and feelings: A mediating role of psychological distress

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Abstract

Individuals may experience internal identity asymmetry when they feel misidentified and believe their colleagues do not recognize their work-related identities. This research examines the impact of internal identity asymmetry on their behavior and emotional outcomes at the workplace in Pakistan. Data was collected through a survey and received responses from 393 participants at different levels of management in various sectors of Pakistan. A partial least square-based structural equation modeling technique has been used to validate the proposed research model and develop hypotheses. The findings indicate that psychological distress has a positive indirect effect on both outcomes, such as individual work performance and well-being during personal and professional base asymmetries time. The result indicates that employees face psychological distress while experiencing internal identity asymmetries, which may decrease the performance and well-being of the employees. Findings highlight the importance of coping strategies in improving the performance and well-being of employees. Managers can be supportive in maintaining a positive workplace environment where individuals can have a more accurate self-perception and a better understanding of their colleagues' perspectives. This, in turn, enables them to adopt appropriate coping strategies to enhance both performance and well-being.

Keywords: Internal identity asymmetry, Psychological distress, Coping strategies, Behavior, Feelings

Citation: Batool, R., Tian, Q., Zhou, E., & Hasan, N. (2024). Impact of internal identity asymmetry on employee's behaviors and feelings: A mediating role of psychological distress. *Heliyon*, 10(10), e31438 DOI: <https://doi.org/10.1016/j.heliyon.2024.e31438>

Title of the Article: 27

M-Learning in education during COVID-19: A systematic review of sentiment, challenges, and opportunities

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Abstract

The flexibility and relatively low cost of mobile devices make educational systems more accessible for learners and educators worldwide. When incorporated with the internet, it creates a better learning environment than the conventional classroom lecture. Many studies have been done to shed insight into the existing state of mobile

learning (M-learning) studies. However, further research is needed into this topic at a specific time, i.e., during the COVID-19 pandemic. This study aims to retrieve, review, investigate, and critically assess the existing literature on M-learning that was conducted during the COVID-19 concerning our research theme. This study considered publications from four databases, narrowed our initial search results of 4056 articles down to 83 that are relevant to our research questions, and did an in-depth analysis based on the systematic review protocol. The findings explored the major focusing areas of M-learning applications, the regional sentiment of M-learning users, the determinants and perceptions of M-learning, as well as the benefits, challenges, and opportunities associated with M-learning. This systematic literature review (SLR) was performed to apportion a contribution toward an improved understanding of the basic principles that underpin the rethinking of M-learning applications for policymakers, online course designers, and blended learning facilitators.

Keywords: M-learning, Education research, COVID-19, Sentiment, Challenges, Opportunities, Systematic literature review

Citation: Qazi, A., Qazi, J., Naseer, K., Hasan, N., Hadaker, G., & Bao, D. (2024). M-Learning in education during COVID-19: A systematic review of sentiment, challenges, and opportunities. *Heliyon*, 10(12), e32638 DOI: <https://doi.org/10.1016/j.heliyon.2024.e32638>

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Title of the Article: 28

Women's adoption of wearable health-monitoring technology: empirical evidence from a least developed country

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Abstract

Purpose – Although wearable health-monitoring technology (WHMT) has become a stimulus for public health, women's acceptance rate of this technology appears to be low. Thus, this study intends to investigate the factors affecting women's adoption of WHMT.

Design/methodology/approach –The unified theory of acceptance and use of technology–2 model has been used in this study as a research framework that has been extended to include lifestyle and attitude. The proposed extended framework is validated using primary data (n 5 314) collected from female respondents using a structured questionnaire; the partial least square-based structural equation modeling technique is subsequently used to test the proposed hypothesis.

Findings – The results show that effort expectancy, social influence, price value, habit, attitude and lifestyle have significant positive effects on women’s behavioral intention to use WHMT and accelerate actual usage behavior. Notably, effort expectancy and habit exhibit the largest impact on behavioral intention. However, performance expectancy, facilitating conditions and hedonic motivation are not significantly associated with behavioral intentions.

Practical implications – The findings of this study are important for healthcare practitioners and service providers to comprehensively understand the factors that affect women’s behavioral intentions in line with their actual usage behavior. This insight will help policymakers design viable strategies regarding WHMT to promote its sustainable usage in least developed countries.

Originality/value – This study contributes novelty by using an extended model that links women’s attitudes and lifestyles to their adoption of WHMT. This study also fills the gaps in the existing literature on women’s behavioral intentions in the context of WHMT by showing novel associations in the domain of WHMT uptake.

Keywords: Women, Technology adoption, Health information system, Least developed country, Behavioral intention, Actual use

Paper type: Research paper

Citation: Rahman, M. S., Hasan, N., Zhang, J., Moral, I. H., & Hossain, G. M. S. (2024). Women’s adoption of wearable health-monitoring technology: empirical evidence from a least developed country. *Aslib Journal of Information Management*. DOI: <https://doi.org/10.1108/AJIM-06-2023-0190>

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Title of the Article: 29

Rise of inflation and formation of interest rate on loans in industrial sector: A VECM approach to assess the impact on total industrial production from evidence of Bangladesh

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Abstract

Industrial development is the prerequisite for sustainable economic growth. This study has examined the impact of the interest rate imposed on advances in the small and medium enterprise (SME) industrial sector, the large industrial (LI) sector, and inflation on the total industrial development of Bangladesh. For this purpose, we have used monthly data from January 2015 to June 2021. The weighted average interest rate of advances (WAIRA) is used as a substitute for the interest rate imposed on advances that were sourced from Bangladesh Bank (BB). We have applied Johansen co integration and the VECM technique to investigate long- and short run relationships, and the results have revealed the existence of both. We have observed that, in the short run, only WAIRA on SME industries has a significant negative impact on total industrial development. In the long run, inflation and WAIRA on SME and large industry have a significant impact on industrial development. The long run relationships have indicated that, inflation and WAIRA in the SME sector have a negative influence on total industrial development, but WAIRA in the large industry

(LI) sector has a positive influence. Finally, considering the entire situation of the economy of Bangladesh, especially the growing industrial sector, these findings are highly momentous for policy implications and achieving sustainable development in this sector.

Keywords: Weighted average interest rate on advance (WAIRA) Inflation Industrial production index Industrial development Johansen test VECM Bangladesh

Citation: Chowdhury, A., Ratna, T. S., Akhter, T., & Hossain, S. F. A. (2024). Rise of inflation and formation of interest rate on loans in industrial sector: A VECM approach to assess the impact on total industrial production from evidence of Bangladesh. *Heliyon*, 10(3), e24976. DOI: <https://doi.org/10.1016/j.heliyon.2024.e24976>

Title of the Article: 30

Service quality (SERVQUAL) model in private higher education institutions: A bibliometric analysis of past, present, and future prospects

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Abstract

The purpose of this study is to conduct a bibliometric analysis of Service Quality (SERVQUAL) research in private higher education institutions (HEIs). This analysis aims to provide a comprehensive evaluation of SERVQUAL's current state and future potential in private HEIs. This study collected 205 journal articles from the Web of Science database using a bibliometric approach. Then, co-citation and co-word analyses were conducted to determine the most influential publications, analyze the knowledge structure, and forecast future trends. This review offers valuable insight into the expanding field of SERVQUAL research, despite its limitations, as the analysis revealed five clusters in co-citation and co-word analysis, respectively. This study contributes to the existing body of knowledge by offering a comprehensive understanding of SERVQUAL in the context of private HEIs. Additionally, it provides insight into potential future developments in this field.

Keywords: SERVQUAL, Private higher education institutions, Bibliometric analysis, Web of science, Education policy

Citation: Wider, W., Tan, F. P., Tan, Y. P., Lin, J., Fauzi, M. A., Wong, L. S., ... & Hossain, S. F. A. (2024). Service quality (SERVQUAL) model in private higher education institutions: A bibliometric analysis of past, present, and future prospects. *Social Sciences & Humanities Open*, 9, 100805. DOI: <https://doi.org/10.1016/j.ssaho.2024.100805>

Title of the Article: 31

The evolution of smart hotels: A bibliometric review of the past, present and future trends

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Abstract

This study provides a bibliometric analysis of smart hotel research, drawing from 613 publications in the Web of Science (WoS) database to examine scholarly trends and developments in this dynamic field. Smart hotels, characterized by integrating advanced technologies such as AI, IoT, cloud computing, and big data, aim to redefine customer experiences and operational efficiency. Utilizing co-citation and co-word analysis techniques, the research delves into the depth of literature from past to future trends. In co-citation analysis, clusters including “Sustainable Hotel and Green Hotel”, “Theories Integration in Smart Hotel Research”, and “Consumers’ Decisions about Green Hotels” underscore the pivotal areas of past and current research. Co-word analysis further reveals emergent trend clusters: “The New Era of Sustainable Tourism”, “Elevating Standards and Guest Loyalty”, and “Hotels’ New Sustainable Blueprint in Modern Travel”. These clusters reflect the industry’s evolving focus on sustainability and technology-enhanced guest experiences. Theoretically, this research bridges gaps in smart hotel literature, proposing new frameworks for understanding customer decisions amid technological advancements and environmental responsibilities. Practically, it offers valuable insights for hotel managers, guiding technology integration strategies for enhanced efficiency and customer loyalty while underscoring the critical role of green strategies and sustainability.

Keywords: Bibliometric analysis, Smart hotels, Sustainable tourism, Co-word analysis, Co-citation analysis

Citation: Liu, X., Wider, W., Fauzi, M. A., Jiang, L., Udang, L. N., & Hossain, S. F. A. (2024). The evolution of smart hotels: A bibliometric review of the past, present and future trends. *Heliyon*, 10 (4), e26472. DOI: <https://doi.org/10.1016/j.heliyon.2024.e26472>

Title of the Article: 32

Restoration of Doleshwar Mosque: Reviving Craft and Engaging Craftsmen of Lime-surkhi

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Abstract

The goal of this paper is to present the revival of the long-lost craft of lime-surkhi and demonstrate its use in the

restoration of Doleshwar Mosque in Bangladesh. This paper evaluates the current status of the lime-surkhi craft and shows how it is being revived. Doleshwar Mosque, a British colonial mosque that showcases some of the best surviving specimens of lime-surkhi work, is used as a case study. The research here investigates the challenges that the craft and craftsmen encounter and discusses how the restoration effort might serve as a model for a sustainable future for the craft, using key informant interviews and focus group discussions as research methodologies. There are no comparable studies on this topic in the context of Dhaka in Bangladesh. The study offers a three-step process for facilitating the survival of the craft through collaboration and capacity building: identifying the rare craftsmen, giving them the recognition they deserve, and passing on the traditional knowledge by drawing in the next generation. This article has the potential to present the development of new policies pertaining to the revival of crafts, not just for Bangladesh but also for other cities facing similar issues with dwindling crafts and craftsmen.

Keywords: Craft revival; lime-surkhi; craftsman; UNESCO Asia-Pacific awards; Doleshwar, Mosque

Citation: Ahmed, I. (2025). Restoration of Doleshwar Mosque: Reviving Craft and Engaging Craftsmen of Lime-surkhi. *Studies in Conservation*, 70(2), 170-185. DOI: <https://doi.org/10.1080/00393630.2024.2355783>

Title of the Article: 33

Unsupervised machine learning approach for tailoring educational content to individual student weaknesses

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Abstract

By analyzing data gathered through Online Learning (OL) systems, data mining can be used to unearth hidden relationships between topics and trends in student performance. Here, in this paper, we show how data mining techniques such as clustering and association rule algorithms can be used on historical data to develop a unique recommendation system module. In our implementation, we utilize historical data to generate association rules specifically for student test marks below a threshold of 60%. By focusing on marks below this threshold, we aim to identify and establish associations based on the patterns of weakness observed in the past data. Additionally, we leverage K-means clustering to provide instructors with visual representations of the generated associations. This strategy aids instructors in better comprehending the information and associations produced by the algorithms. K-means clustering helps visualize and organize the data in a way that makes it easier for instructors to analyze and gain insights, enabling them to support the verification of the relationship between topics. This can be a useful tool to deliver better feedback to students as well as provide better insights to instructors when developing their pedagogy. This paper further shows a prototype implementation of the above-mentioned concepts to gain opinions and insights about the usability and viability of the proposed system.

Keywords: Recommendation system, Clustering, F-P growth, Apriori, Associative pattern, E-learning sphere, Online learning

Citation: Rahman, S. I., Ahmed, S., Fariha, T. A., Mohammad, A., Haque, M. N. M., Chellappan, S., & Noor, J. (2024).

Title of the Article: 34

Doing' Legal History in Refugee Law: A Snapshot of Bangladesh's Engagement with Non-Refoulement

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Abstract

This article advocates for the adoption of legal history in the study of refugee law and associated legal scholarship. It begins by illustrating the meaning and value of legal history by sifting through the texts introducing the inaugural issues of some of the world's most reputed legal history journals. It asks what makes a good legal historian and highlights the impossibility of attaining total objectivity when producing historical work. The article then sheds light on archival research and oral history as essential tools for doing legal history but cautions against being swayed by arrogant claims that the application of such empiricist and contextualist methods produces impartial legal history. Finally, the article demonstrates the value of doing legal history in refugee law by offering a snapshot of Bangladesh's engagement with non-refoulement in the late 1970s when mass displacements of the Rohingya people from Myanmar and Indian Muslims from India took place.

Keywords: history, legal history, refugee law, Bangladesh, Rohingya, Indian Muslims, nonrefoulement, archival research, oral history

Citation: Hossain, M. S. (2024). 'Doing' legal history in refugee law: A snapshot of Bangladesh's engagement with non-refoulement. *Journal of Refugee Studies*, 37(4), 976-993. DOI: <https://doi.org/10.1093/jrs/fead025>

Title of the Article: 34

Decentralised identity federations using blockchain

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Abstract

Federated Identity Management offers numerous economic benefits and convenience to Service Providers and users alike. In such federations, the Identity Provider (IdP) is the solitary entity responsible for managing user credentials and generating assertions for the users, who are requesting access to a service provider's resource. This makes the

IdP centralised and exhibits a single point of failure for the federation, making the federation prone to catastrophic damages. The paper presents our effort in designing and implementing a decentralised system in establishing an identity federation. In its attempt to decentralise the IdP in the federation, the proposed system relies on blockchain technology, thereby, mitigating the single point of failure shortcoming of existing identity federations and is designed using a set of requirements. In this article, we explore different aspects of designing and developing the system, present its protocol flow, analyse its performance, and evaluate its security using ProVerif, a state-of-the-art formal protocol verification tool.

Keywords: Identify federation, Federated identities, SAML, Decentralised identity federation, Blockchain, ProVerif

Citation: Shuhan, M. K. B., Hasnayeem, S. M., Das, T. K., Sakib, M. N., & Ferdous, M. S. (2024). Decentralised identity federations using blockchain. *International Journal of Information Security*, 23(4), 2759-2782. DOI: <https://doi.org/10.1007/s10207-024-00864-6>

Title of the Article: 36

The Promise of Metal-Doped Iron Oxide Nanoparticles as Antimicrobial Agent

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Abstract

Antibiotic resistance (AMR) is one of the pressing global public health concerns and projections indicate a potential 10 million fatalities by the year 2050. The decreasing effectiveness of commercially available antibiotics due to the drug resistance phenomenon has spurred research efforts to develop potent and safe antimicrobial agents. Iron oxide nanoparticles (IONPs), especially when doped with metals, have emerged as a promising avenue for combating microbial infections. Like IONPs, the antimicrobial activities of doped-IONPs are also linked to their surface charge, size, and shape. Doping metals on nanoparticles can alter the size and magnetic properties by reducing the energy band gap and combining electronic charges with spins. Furthermore, smaller metal-doped nanoparticles tend to exhibit enhanced antimicrobial activity due to their higher surface-to-volume ratio, facilitating greater interaction with bacterial cells. Moreover, metal doping can also lead to increased charge density in magnetic nanoparticles and thereby elevate reactive oxygen species (ROS) generation. These ROS play a vital role to disrupt bacterial cell membrane, proteins, or nucleic acids. In this review, we compared the antimicrobial activities of different doped-IONPs, elucidated their mechanism(s), and put forth opinions for improved biocompatibility.

Citation: Tasnim, N. T., Ferdous, N., Rumon, M. M. H., & Shakil, M. S. (2023). The promise of metal-doped iron oxide nanoparticles as antimicrobial agent. *Acs Omega*, 9(1), 16-32. DOI: <https://doi.org/10.1021/acsomega.3c06323>

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Title of the Article: 37

School to work transition: Employment and expectations of former madrasa students in Cox's Bazar, Bangladesh

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Abstract

We document the dynamics of the school-to-work transition of former madrasa students in Cox's Bazar, Bangladesh – the host community of the Rohingya refugees. We conduct a phone survey using a respondent-driven sampling (RDS) technique to understand the labour market opportunities and aspirations of former madrasa students in Cox's Bazar who are 15–40 years old. We find that most of the respondents are in the labour market, with male respondents driving this trend. There is a strong willingness to participate in training and expectations that receiving training will double income. We report that there is a mismatch between the actual and desired sector of employment– most of the employed respondents want to engage in different income-generating activities than their current ones. We also find gender differences in the types of training desired and expected income.

Keywords: School-to-work transition, Cox's Bazar, Madrasa education, Labour market outcomes, Training, Aspirations, Income expectations

Citation: Ahmed, M. S., Arman, M. R., Hossain, M., Rahman, K. W., & Rahman, N. T. (2024). School to work transition: Employment and expectations of former madrasa students in Cox's Bazar, Bangladesh. *International Journal of Educational Development*, 106, 103020. DOI: <https://doi.org/10.1016/j.ijedudev.2024.103020>

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Title of the Article: 38

Protocol for the Adolescent Menstrual Experiences and Health Cohort (AMEHC) Study in Khulna, Bangladesh: A Prospective cohort to quantify the influence of menstrual health on adolescent girls' health and education outcomes

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Abstract

Background: Menstrual health is essential for gender equity and the well-being of women and girls. Qualitative research has described the burden of poor menstrual health on health and education; however, these impacts have not been quantified, curtailing investment. The Adolescent Menstrual Experiences and Health Cohort (AMEHC) Study aims to describe menstrual health and its trajectories across adolescence, and quantify the relationships between menstrual health and girls' health and education in Khulna, Bangladesh.

Methods and analysis: AMEHC is a prospective longitudinal cohort of 2016 adolescent girls recruited at the commencement of class 6 (secondary school, mean age=12) across 101 schools selected through a proportional random sampling approach. Each year, the cohort will be asked to complete a survey capturing (1) girls' menstrual health and experiences, (2) support for menstrual health, and (3) health and education outcomes. Survey questions were refined through qualitative research, cognitive interviews and pilot survey in the year preceding the cohort. Girls' guardians will be surveyed at baseline and wave 2 to capture their perspectives and household demographics. Annual assessments will capture schools' water, sanitation and hygiene, and support for menstruation and collect data on participants' education, including school attendance and performance (in maths, literacy). Cohort enrolment and baseline survey commenced in February 2023. Follow-up waves are scheduled for 2024, 2025 and 2026, with plans for extension. A nested subcohort will follow 406 post-menarche girls at 2-month intervals throughout 2023 (May, August, October) to describe changes across menstrual periods. This protocol outlines a priori hypotheses regarding the impacts of menstrual health to be tested through the cohort.

Ethics and dissemination: AMEHC has ethical approval from the Alfred Hospital Ethics Committee (369/22) and BRAC James P Grant School of Public Health Institutional Review Board (IRB-06 July 22-024). Study materials and outputs will be available open access through peer-reviewed publication and study web pages.

Citation: Hennegan, J., Hasan, M. T., Jabbar, A., Jalil, T., Kennedy, E., Hunter, E., ... & Azzopardi, P. (2024). Protocol for the Adolescent Menstrual Experiences and Health Cohort (AMEHC) Study in Khulna, Bangladesh: A Prospective cohort to quantify the influence of menstrual health on adolescent girls' health and education outcomes. *BMJ open*, 14(4), e079451. DOI: <https://doi.org/10.1136/bmjopen-2023-079451>

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Title of the Article: 39

EFL Learners' Participation in Primary Schools of Coastal Areas in Bangladesh

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Abstract

Despite numerous initiatives by both governmental and non-governmental organizations, primary level students' skills in English language are still below the expected level in Bangladesh (Hamid & Honan, 2012; Sultana, 2010). Our study examined reasons behind the limited participation of EFL (English as a Foreign Language) learners in primary level classrooms in the coastal areas of Bangladesh. To conduct the research, we followed an explanatory sequential mixed methods design (Creswell, 2014; Creswell & Creswell, 2018; Ivankova & Stick, 2007). We collected data from 37 male and 23 female students in grades four and five through questionnaire surveys and three focus group discussions (FGDs). We also collected data from five teachers through interviews and three class observations. We found that teachers had less motivation to create an interactive learning environment for the students due to heavy teaching loads and administrative assignments. Many of the students had low academic expectations and motivation, lived in poor socio-economic conditions that required them to work, and were impacted by frequent natural disasters that interrupted their regular classes. The results of our research provide insights for educationists and policymakers related to primary education in disaster-prone coastal areas as well as other rural parts of the country.

Keywords: mixed methods, primary level learner, EFL classroom, coastal areas of Bangladesh

Citation: Sufian, M. A. (2024). EFL Learners' Participation in Primary Schools of Coastal Areas in Bangladesh. *The Qualitative Report*, 29(1), 0_1-49. DOI: <https://doi.org/10.46743/2160-3715/2024.4551>

Title of the Article: 40

Metasurface absorber based single junction thin film solar cell exceeding 30% efficiency

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Abstract

In this article, we report, as per our knowledge, for the first time, a thin film single junction solar cell with a metasurface absorber layer directly incorporated. We have used an interconnected dual inverted split ring resonator pattern in the InAsP absorber layer. The structure eliminated patterns of conventional metals, such as silver, aluminum, and gold, from the active layer, a common drawback in conventional solar absorbers, hindering their direct integration into solar cells. Optical simulation results show a peak ideal short circuit current density of 76.23mA/cm² for the meta-absorber structure under solar illumination. This current is the highest among previously reported absorbers based on Group IV materials and III-V compounds, overcoming the low solar absorption of such metasurfaces. The final proposed solar cell structure combines this meta-absorber layer with traditional efficiency enhancement methods namely anti-reflecting coating, textured back reflector, and transparent top electrode. This novel single junction structure shows a

solar absorption efficiency of 97.86% and a power conversion efficiency of 30.87%, the highest for III-V solar cells. Our device proves the ability of metasurface absorber layers to produce high-efficiency solar cells and is expected to pave the way for integrating novel meta-devices into state-of-the-art photovoltaic devices, aiding the global transition towards clean energy sources.

Citation: Karim, M. E., & Mohsin, A. S. (2024). Metasurface absorber based single junction thin film solar cell exceeding 30% efficiency. *Optics Express*, 32(5), 8214-8229. DOI: <https://doi.org/10.1364/OE.510421>

Title of the Article: 41

Does e-agriculture practice matter for poverty reduction among coastal farm households?

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Abstract

The study hypothesizes that e-agriculture practice may contribute to multidimensional poverty reduction in the coastal areas of Bangladesh. Two-stage instrumental variable (IV) Tobit and seemingly unrelated regression (SUR) analyses are used to identify the relationship. We collected data from 351 rice producing households applying a multi-stage sampling technique. Results reveal that e-agriculture adoption significantly reduces multidimensional poverty by 32 percentage points compared to non-adoption. Besides, education, farming experience, residence in the peri-urban area, and access to agricultural extension services are identified as positive predictors of e-agriculture adoption. The SUR regressions show that e-agriculture practice can help improve the standard of living of coastal farm households. In addition, multiple cropping patterns significantly contribute to the reduction of all the deprivations of multidimensional poverty. Based on the research outcomes, the study advocates broadening access to extension services to seamlessly incorporate small and marginalized farm households in remote coastal areas. Such integration may equip coastal communities with comprehensive insights into e-agriculture, thereby empowering them to fully leverage the advantages inherent in this farming technique.

Keywords: e-Agriculture, Multidimensional poverty index (MPI), Technology adoption, Rice, Coastal Bangladesh

Citation: Islam, M. K., & Farjana, F. (2024). Does e-agriculture practice matter for poverty reduction among coastal farm households?. *Journal of Agriculture and Food Research*, 17, 101212. DOI: <https://doi.org/10.1016/j.jafr.2024.101212>

Title of the Article: 42

The national-level potential of Zakat and its integration into the fiscal framework: sector-specific insights from the economy of Bangladesh

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Abstract

Purpose: Zakat, one of the fundamental pillars of Islam, holds the potential to significantly contribute to fiscal consolidation, particularly in developing nations. However, the national-level potential of Zakat often remains unexplored. This study aims to explore the potential of national-level Zakat and the opportunity to integrate it into the fiscal framework.

Design/methodology/approach: This study estimates Zakat's potential on national financial and economic components. The components include bank deposits, shares and securities, pensions (provident fund), industrial production and trade services, mining resources, Ushr on agro-crops and forestry, Ushr on livestock, Ushr on fishery, gross domestic product (GDP), national budget and national revenue. The study gathers data, ranging from FY2000 to FY2018, on national economic sectors from reliable secondary sources. The net value (NV) of each indicator is calculated as $NV = TV - LA$, where NV is the wage-adjusted net value after deducting the living adjustment (LA) value from the sectoral total. The proposed LA value, approximately 20%, is suggested to be deducted from the total sectoral value of each sector (excluding specific industries with preadjusted wages), equating to the Nisab value.

Findings: It is estimated that the aggregate potential of Zakat in Bangladesh was US\$9,749m in FY2018, compared to US\$809m in FY2000, revealing the value is 3.77% of GDP and 21% of the national fiscal budget. In FY2018, the service sector was the largest contributor (30%), followed by bank deposits (23%). Pension funds made minimal contributions, whereas shares and bonds, as well as the manufacturing sector, each made a 10% contribution to the estimated Zakat potential. Zakat on agriculture output accounted for 15% of the total. The aggregate potential Zakat in FY2018 was 12% higher than that in FY2000.

Originality/value: The paper highlights a novel contribution through its nuanced analysis of sector-specific Zakat on macrolevel data and its implications within the fiscal framework. The results suggest that Zakat has substantial potential to impact fiscal dynamics, providing valuable insights for policymakers and stakeholders to recognize the national-level Zakat for development plans such as the five-year plan. The study suggests piloting a central and independent national body to study the feasibility of national-level Zakat collection and its utilization in the fiscal budget. It will help the government reduce the burden of external debt and deficit budget and, instead, will promote revenue collection in collaboration with the National Board of Revenue.

Keywords: Zakat distribution, Covid-19, Malpractices, Perception, Socio-economic Zakat, Bangladesh

Paper type: Research paper

Citation: Hassan, M. K., Khan, M. Z. H., Miah, M. A., & Islam, M. K. (2024). The national-level potential of Zakat and its integration into the fiscal framework: sector-specific insights from the economy of Bangladesh. *International Journal of Islamic and Middle Eastern Finance and Management*, 17(1), 146-169. DOI: <https://doi.org/10.1108/IMEFM-09-2023-0313>

Title of the Article: 43

Breaking barriers and empowering marginal women entrepreneurs in Bangladesh for sustainable economic growth:
a narrative inquiry

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Abstract

Purpose: The bread and butter of marginal communities primarily rely on their artisanal work, to which the communities' women have notable contributions despite facing numerous challenges. This study aims to unveil the challenges along with latent opportunities of different marginal women entrepreneurs in the rural areas of Bangladesh.

Design/methodology/approach: This study used narrative inquiry to explore the real-life business phenomena of 15 marginal women entrepreneurs with more than 5 years of business experience living in 4 districts of Bangladesh. This approach was used to document participants' responses through the storytelling of their daily business experiences.

Findings: The findings of this paper indicate that vulnerable living conditions, social negligence, availability of substitutes, frequent sickness, increasing price of raw materials, lack of entrepreneurial skills and lack of managerial skills are the major challenges of marginal women entrepreneurs. In contrast, minimum capital requirement, home-based business, traditional profession, retaining cultural heritage and lack of accountability are the main opportunities that motivate marginal women to continue their entrepreneurial activities.

Research limitations/implications: The insight of this research can promote and sustain marginal women entrepreneurship and aid researchers, policymakers and businesses in improving the various entrepreneurial aspects of informal community entrepreneurs in developing countries. However, the study was limited to five marginal community entrepreneurs (Rishi, Kumor, Jele, Cobbler and Kamar) in Bangladesh. Therefore, conducting future research encompassing all marginalized communities is recommended, and empirical studies on this domain are highly encouraged.

Social implications: The insight of this research can promote and sustain marginal women entrepreneurship and aid researchers, policymakers and businesses in improving the various entrepreneurial aspects of informal community entrepreneurs in developing countries.

Originality/value: In the authors' knowledge, this is unique research on marginal women entrepreneurs in Bangladesh.

Keywords: Economic growth, Marginal community, Women entrepreneurship, Narrative inquiry, Opportunities, Challenges

Paper type: Research paper

Citation: Moral, I. H., Rahman, M. M., Rahman, M. S., Chowdhury, M. S., & Rahaman, M. S. (2024). Breaking barriers and empowering marginal women entrepreneurs in Bangladesh for sustainable economic growth: a narrative inquiry. *Social Enterprise Journal*, 20(4), 585-610. DOI: <https://doi.org/10.1108/SEJ-04-2023-0050>

Challenges of rural women entrepreneurs in Bangladesh to survive their family entrepreneurship: a narrative inquiry through storytelling

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Abstract

Purpose: Family entrepreneurship benefits women because of their economic, family, and social needs. But, as rural women, it is not much easy for them to maintain their family entrepreneurship successfully. Thus, this paper aims to explore the main challenges faced by rural women entrepreneurs in Bangladesh to survive their family entrepreneurship.

Design/methodology/approach: This study is qualitative in nature, based on narrative inquiry. The purposive sampling technique was used as a part of a non-probability sampling method to collect the data from rural women entrepreneurs from three districts (Khulna, Shatkhira, and Sylhet) in Bangladesh engaged in family entrepreneurship. No new information was found after collecting the data from seven (07) respondents; thus, they were chosen as the final sample size.

Findings: The findings show that rural women entrepreneurs faced primarily social and cultural, financial, and skill-related challenges, though they face other challenges to survive their family entrepreneurship. The attitude and perception of society toward women and their roles are at the root of social and cultural barriers. Researchers also found that financial challenges have a colossal impact on rural women and the other problem.

Practical implications: Although entrepreneurial activities are essential for socio-economic development in these developing countries, this research adds to the existing information by highlighting the main challenges that rural women face when they want to be business owners and entrepreneurs.

Originality/value: Research on rural women entrepreneurship in Bangladesh is limited and new. This study can provide an overview of the challenges faced by the rural women entrepreneurs and provide them with a blueprint for the development of women entrepreneurs in developing countries.

Keywords: Bangladesh, Challenges, Entrepreneurship, Family, Rural, Women

Paper type: Research paper

Citation: Rahman, M. M., Dana, L. P., Moral, I. H., Anjum, N., & Rahaman, M. S. (2022). Challenges of rural women entrepreneurs in Bangladesh to survive their family entrepreneurship: a narrative inquiry through storytelling. *Journal of Family Business Management*, 13(3), 645-664. DOI: <https://doi.org/10.1108/JFBM-04-2022-0054>

Title of the Article: 45

Mental health of hawkers during COVID-19: a marginal community in Bangladesh

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Abstract

Purpose – Globally, the COVID-19 pandemic impacts the financial condition and the mental health of millions of workers from various informal sectors. This study aims to look into the hawkers' community's mental health and living conditions in Bangladesh during COVID-19.

Design/methodology/approach – The researchers have applied the purposive sampling technique to choose ten hawkers from Khulna city, a district in the southern region of Bangladesh. An in-depth interview was taken in the Bengali language in an unstructured manner and lasted 30–40 min per respondent.

Findings – The findings showed that the Hawkers' income reduced, and specifically, during the pandemic, they had earned half of what they usually made before. Besides, they could not open their stores because law enforcement agencies imposed restrictions on opening business centres during the lockdown except for some emergency necessities shops. This restriction led the hawkers to stop selling their products because there was a high chance of spreading the virus through the products they sold. Due to income reduction, they had to eat cheap food, which caused their health problems. Consequently, this community mentally got depressed.

Practical implications – Policymakers in Bangladesh might think about enacting more effective measures to provide some extrinsic and intrinsic support in improving the mental health of the hawkers' community.

Originality/value – To the best of the authors' knowledge, this is the first study on the mental of the hawkers' community during COVID-19.

Keywords: Bangladesh, Mental, Community, Hawker, COVID-19, Informal entrepreneur, Psychology

Paper type: Research paper

Citation: Moral, I. H., Rahaman, M. S., Imran, M. S., & Rahman, M. M. (2023). Mental health of hawkers during COVID-19: a marginal community in Bangladesh. *Journal of Enterprising Communities: People and Places in the Global Economy*, 17(4), 926-939. DOI: <https://doi.org/10.1108/JEC-01-2022-0006>

Title of the Article: 46

Training & development, career development, and organizational commitment as the predictor of work performance

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Abstract

This study aims to justify the mediating effect of organizational commitment in the association between training and development, career development, and work performance. Data was collected from 362 frontline hotel employees through a survey by random sampling technique. The analysis methodology comprises descriptive statistics, measurement, and structure models through SPSS 23 and Smarts PLS 3.0. This study significantly examined the correlation between training and development and work performance, career development, and work performance. Moreover, organizational commitment in the hotel sector is significantly associated with work performance. Furthermore, the significant correlation between training and development and work performance career development among hotel personnel is mediated by organizational commitment. Owners and managers should know the necessary policies to enhance employees' work performance and organizational commitment and consider appropriate behaviour. Besides, all required facilities for enhancing career development and training and development should be implemented to strengthen hotels' present and future demands. It is furthered by the study's explanations of the results and their limitations, which also included suggestions for future research possibilities. This research filled the gap in the hotel industry in Bangladesh, where study works into wide-ranging training and development, career development practices, organizational commitment, and work performance were rare.

Keywords: Hotel industry, Social exchange theory, HR practices, Work performance, Frontline employees

Citation: Hosen, S., Hamzah, S. R. A., Ismail, I. A., Alias, S. N., Abd Aziz, M. F., & Rahman, M. M. (2024). Training & development, career development, and organizational commitment as the predictor of work performance. *Heliyon*, 10(1), e23903. DOI: <https://doi.org/10.1016/j.heliyon.2023.e23903>

Title of the Article: 47

Review of Mono-and Bifacial Photovoltaic Technologies: A Comparative Study

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Abstract

This article reviews the recent works on bifacial and monofacial photovoltaic (PV) technologies. Furthermore, the effectiveness of bifacial PV technologies over that of monofacial technologies is examined. Unlike monofacial PVs, bifacial PVs have light sensitivity on both the front as well as the rear surface and, therefore, have higher PV yield compared to monofacial PVs. However, because of higher energy output, thermal and electrical behavior are critical in bifacial PV, which needs to be optimized for bifacial PV cells to maintain the optimum cell efficiency. Studies show that bifacial thin-film Si-heterojunction PV cells have the maximum laboratory efficiency. Surface area, the fraction of light reflected, geographical location, economy, and efficiency are key contributing factors that govern the selection of bifacial PV systems. The dual use of land gives an edge to bifacial PV systems over monofacials. The dual use of land cases, such as agri-PVs with bifacial, vertical bifacial, and floating-PVs with bifacial, are unique systems where monofacial PV modules are less effective.

Keywords: Agri-photovoltaic (PV) with bifacial, bifacial, bifaciality factor, floating-PV with bifacial, heterojunction cell, monofacial.

Citation: Mahim, T. M., Rahim, A. H. M. A., & Rahman, M. M. (2024). Review of mono-and bifacial photovoltaic technologies: A comparative study. *IEEE Journal of Photovoltaics*, 14(3), 375 – 396. DOI: <https://doi.org/10.1109/JPHOTOV.2024.3366698>

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Title of the Article: 48

Safety and efficacy of new generation azole antifungals in the management of recalcitrant superficial fungal infections and onychomycosis

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Abstract

Introduction: Terbinafine is considered the gold standard for treating skin fungal infections and onychomycosis. However, recent reports suggest that dermatophytes are developing resistance to terbinafine and the other traditional antifungal agents, itraconazole and fluconazole. When there is resistance to terbinafine, itraconazole or fluconazole, or when these agents cannot be used, for example, due to potential drug interactions with the patient's current medications, clinicians may need to consider off-label use of new generation azoles, such as voriconazole, posaconazole, fosravuconazole, or oteseconazole. It is essential to emphasize that we do not advocate the use of newer generation azoles unless traditional agents such as terbinafine, itraconazole, or fluconazole have been thoroughly evaluated as first-line therapies.

Areas covered: This article reviews the clinical evidence, safety, dosage regimens, pharmacokinetics, and management algorithm of new-generation azole antifungals.

Expert opinion: Antifungal stewardship should be the top priority when prescribing new-generation azoles. First-line antifungal therapy is terbinafine and itraconazole. Fluconazole is a consideration but is generally less effective and its use may be off-label in many countries. For difficult-to-treat skin fungal infections and onychomycosis, that have failed terbinafine, itraconazole and fluconazole, we propose consideration of off-label voriconazole or posaconazole.

Keywords: Posaconazole; fosravuconazole; voriconazole; oteseconazole; new generation azoles; onychomycosis; superficial fungal infections

Citation: Gupta, A. K., Talukder, M., Shemer, A., & Galili, E. (2024). Safety and efficacy of new generation azole antifungals in the management of recalcitrant superficial fungal infections and onychomycosis. *Expert Review of Anti-infective Therapy*, 22(6), 399-412. DOI: <https://doi.org/10.1080/14787210.2024.2362911>

Title of the Article: 49

A multi-dimensional connectedness and spillover between green bond and Islamic banking equity: Evidence from country level analysis

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Abstract

The paper delves into the multidimensional connections and spillover between green bonds and Islamic banking stocks from eleven countries. Throughout this study, we further explored optimal hedging mechanisms, as well as optimal portfolio weighting mechanisms, with Islamic banking equities and green bonds. Our empirical results show that there is a moderate level of interrelation between green bonds and Islamic banking indices, with low connectedness throughout the long-term and medium-term. The time-varying spillover effects become higher, albeit low, in the early periods of both SOR and COVID-19 at short-, medium-, and long-term scales, which suggests some diversification and hedging benefits from holding portfolios of the two assets. Country-based Islamic bank markets are not largely affected by disturbances that emerged in some other markets in the short-, medium-, or long-term timescales. The Chinese green bond market has a tendency to be the greatest net risk transceiver for both the green bond and Islamic bank markets over the medium and long term, whilst the global green bond index has been the leading net risk transmitter during the short term. Only the UAE and Saudi Islamic Banking indices act as net risk transmitters in the short and medium term. The empirical findings further suggest that global risk variables are dependable drivers of the extent of spillover between Islamic banking indices and green bonds. Our research shows that owning Islamic bank stocks during COVID-19 and SOR minimizes the significant risk linked to holding green bonds, which has profound implications for risk management and portfolio creation. Thus, our study offers important implications for economic agents.

Citation: Billah, M., Hadhri, S., Hoque, M. E., & Balli, F. (2024). A multi-dimensional connectedness and spillover between green bond and Islamic banking equity: Evidence from country level analysis. *Pacific-Basin Finance Journal*, 83, 102258. DOI: <https://doi.org/10.1016/j.pacfin.2024.102258>

Title of the Article: 50

Does news related to digital economy and central bank digital currency affect digital economy ETFs? Evidence from TVP-VAR connectedness and wavelet local multiple correlation analyses

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Abstract

The rapid and widespread digitalization of economies warrants a better understanding of its impact on society and economy. This study contributes to this new but important research agenda by examining how news on digitalization affects digital economy related exchange traded funds (ETFs). For this purpose, we first construct a digital economy attention index by utilizing Google Search Volume Index for several keywords. Then, using this index and two other indices that represent attention and uncertainty related to central bank digital currency (CBDC), we examine the time-varying connectedness and correlations between these three indices and digital economy ETFs. Our TVP-VAR frequency connectedness analysis shows that attention to and uncertainty around the CBDC and digital economy have strong connectedness with the ETFs in the short-term. The analysis also shows that CBDC and digital economy indices are mainly net transmitters of shocks while the majority of the ETFs are the net receivers of the shocks. The results of our wavelet local multiple correlation (WLMC) analysis show that the correlations between ETFs, digital economy and CBDC indices are time- and frequency-dependent. Moreover, both connectedness and correlations are affected by CBDC-related global events and COVID-19 pandemic. The time- and frequency-dependent relation requires active management of the portfolios containing digital economy related assets.

Keywords: CBDC, Digital economy, ETF, Uncertainty, Spillover

Citation: Hoque, M. E., Billah, M., Alam, M. R., & Lucey, B. (2024). Does news related to digital economy and central bank digital currency affect digital economy ETFs? Evidence from TVP-VAR connectedness and wavelet local multiple correlation analyses. *Global Finance Journal*, 61, 100992. DOI: <https://doi.org/10.1016/j.gfj.2024.100992>

Title of the Article: 51

Global uncertainty and the spillover of tail risk between green and Islamic markets: A time-frequency domain approach with portfolio implications

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Abstract

This study first calculates the left tail risks in the renewable energy, green, sustainable, Islamic equity and Islamic bond markets using CAViaR models. Then, applying TVP-VAR based connectedness method it estimates various measures of dynamic connectedness and spillover of the tail risks at short, medium, and long term. Furthermore, through wavelet coherence analysis it examines how various global uncertainties impact such connectedness in time and frequency domain. Lastly, it estimates hedging effectiveness, optimal portfolio weights and Sharpe Ratios to provide practical implications for the market participants. The results show that the tail risk connectedness and spillover are mainly driven by the short-term dynamics emphasizing the importance of short-lived noises in the transmission of down-side risks. Usually, the connectedness of the tail risks is higher during the period of COVID-19 and Russia-Ukraine war. Though the tail risks of Islamic bond and developing Islamic equity markets are mostly isolated in the full sample showing hedging potential of these markets, the network analysis shows their increased connectedness with other markets during the period of COVID-19 and Russia-Ukraine war. In general, mature market indices such as Dow Jones Sustainable World and MSCI global environment indices, Dow Jones Islamic World, US and UK market indices are consistently net contributors/transmitters of tail risk shocks while Islamic bond and developing Islamic equity market indices are net receivers of shocks when they are connected to the network. Two

uncertainty indices, that follow volatility related to gold and US dollar, demonstrate hedging potential and predictive power on the connectedness. Dow Jones Islamic World market index usually carries significant weights in optimal portfolio allocations while Islamic bonds from GCC countries have higher Sharpe Ratios indicating their promise as instruments for risk-adjusted profit.

Keywords: Islamic markets, Green markets, Tail risk transmission, Uncertainty, Portfolio diversification

Citation: Billah, M., Alam, M. R., & Hoque, M. E. (2024). Global uncertainty and the spillover of tail risk between green and Islamic markets: A time-frequency domain approach with portfolio implications. *International Review of Economics & Finance*, 92, 1416-1433. DOI: <https://doi.org/10.1016/j.iref.2024.02.081>

Title of the Article: 52

Gold-backed cryptocurrencies: A hedging tool against categorical and regional financial stress

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Abstract

This study evaluates the potential of gold-backed cryptocurrencies, such as Tether Gold and PAX Gold, as a hedge and safe haven against global, regional, and categorical financial stresses. Hedge and safe haven properties of gold-backed cryptocurrencies are also compared with those of gold and Bitcoin. For the analyses, dynamic conditional correlation (DCC) and quantile coherency techniques are applied to daily data from February 2020 to March 2023. The results show that Tether Gold and PAX Gold are strong safe havens against the US and equity-valuation-related financial stress but weak safe havens against global financial stress. Tether Gold is a weak safe haven against credit-related financial stress as well. Tether Gold is a strong hedge against US financial stress but a weak hedge against aggregate financial stress of developed economies and that of emerging economies. In our sample, gold-backed cryptocurrencies usually outperform gold and Bitcoin as a hedge and safe haven against financial stresses. The Quantile coherency analysis shows that Tether Gold is a hedge against low to moderate financial stress and a safe haven against extreme financial stresses. These findings have important implications for investors, risk-managers and policy makers.

Keywords: Gold-backed crypto, Gold, Bitcoin, Financial stress, DCC, Quantile coherency

Citation: Hoque, M. E., Billah, M., Alam, M. R., & Tiwari, A. K. (2024). Gold-backed cryptocurrencies: A hedging tool against categorical and regional financial stress. *Global Finance Journal*, 60, 100964. DOI: <https://doi.org/10.1016/j.gfj.2024.100964>

Title of the Article: 53

Modelling the mass consumption potential of organic food: Evidence from an emerging economy

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Abstract

The deterioration of the environment, shortage of resources, and frequent occurrence of food safety issues have made people increasingly concerned about themselves while maintaining their health and protecting the environment through food. Organic food, as a healthy and eco-friendly option, is gradually gaining attention. Based on the value-belief-norm theory, this study explores why individuals consume organic food and the range of factors that lead to this consumer behavior. This study adopted a cross-sectional design and collected quantitative data from conveniently selected 300 youth participants in Bangladesh using an online survey. The findings revealed that health values and motivation have a significant positive effect on healthy eating beliefs, which, together with the awareness of the consequences, affect personal norms toward organic food consumption. Personal norms also have a significant positive effect on organic food consumption behavior among Bangladeshi youth. Finally, trust on organic food positively moderates the effect of personal norms on organic food consumption. The findings of this study are expected to foster the development of a comprehensive framework to promote programs and policies focused on organic and healthy food consumption culture among youth in developing nations.

Citation: Yang, Q., Xinyue, L., Hoque, M. E., Al Mamun, A., Rahman, M. K., & Yao, J. (2023). Modelling the mass consumption potential of organic food: Evidence from an emerging economy. *Plos One*, 18(9), e0291089. DOI: <https://doi.org/10.1371/journal.pone.0291089>

Title of the Article: 54

Striking a paradoxical balance: Shakespearean insights for hospitality management

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Abstract

This paper examines how Shakespeare's thoughts on hospitality still resonate with modern-day hotel guests. Focusing on three plays - Romeo and Juliet, Macbeth, and The Tempest - we analyze the nuances of hospitality as depicted by Shakespeare and explore the implications of his insights for modern hotel managers. Shakespeare's portrayal of hospitality as paradoxical highlights the importance of balancing customer expectations and corporate goals to enhance guest satisfaction and loyalty. Drawing from the mentioned plays, we propose practical strategies for creating a hospitable environment and building positive guest-employee reciprocity and relationships. This paper provides significant conceptual implications for the hospitality industry and offers actionable insights by proposing a business model for hotel managers to adapt Shakespearean hospitality concepts into practice.

Keywords: Shakespearean hospitality, guest experience, hotel management, medieval court society, hermeneutic analysis

Citation: Shahidul Islam, M. (2025). Striking a paradoxical balance: Shakespearean insights for hospitality management. *Tourism and Hospitality Research*, 25(1), 147-164. DOI: <https://doi.org/10.1177/14673584231188917>

Title of the Article: 55

Umbrella review in Green Supply Chain Management (GSCM): Developing models for adoption and sustaining GSCM

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Abstract

The abundance of literature reviews in Green Supply Chain Management (GSCM) poses a challenge to making objective, evidence-based decisions due to information diffusion. Few studies systematically summarize these reviews to address this challenge. This study aims to conduct an umbrella review, analyzing existing reviews to identify current trends and enhance our understanding of the GSCM adoption process. A sample of 70 review papers was collected using a systematic approach. Quantitative findings reveal growing publication trends, with China leading in contributions, the Journal of Cleaner Production as the top journal, and Joseph Sarkis as the leading author. Bibliometric analysis using VOSviewer identifies Srivastava's study as the most impactful review paper. Qualitative analysis using NVivo 12 classifies reviews into systematic, narrative, and integrative categories. Additionally, the study presents an integrated framework for understanding GSCM adoption and a green innovation cycle model for sustaining green practices. This research contributes to the literature by providing an umbrella review in the GSCM area, offering classifications based on methodology, and developing practical models for GSCM adoption and sustaining it. The study concludes with implications and identifies areas for future research.

Keywords: Review of reviews, Systematic literature review, Integrated GSCM framework, Green innovation cycle model methodological classification of reviews, Bibliometric

Citation: Islam, M. S., Islam, M. S., Khan, T., Akhter, R., Rahman, S. M., Ara, H., ... & Hoque, I. (2024). Umbrella review in Green Supply Chain Management (GSCM): Developing models for adoption and sustaining GSCM. *Environmental Challenges*, 14, 100820. DOI: <https://doi.org/10.1016/j.envc.2023.100820>

Title of the Article: 56

Utilization of Video Reflexive Ethnography in Hospitality and Tourism Research

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Abstract

This scholarly article investigates the application of Video Reflexive Ethnography (VRE) in hospitality and tourism research. VRE, an innovative approach, employs ethnographic video recordings to facilitate in-depth participant discussions and dissect complex social interactions. The research underscores VRE's capability to reveal intricate social dynamics, thus significantly enhancing service quality and customer experience in these sectors. The study

acknowledges that while VRE has proven effective in healthcare and education, its integration into hospitality and tourism represents an emerging field of inquiry. The paper advocates that VRE provides a more comprehensive knowledge of interpersonal interactions, contributing to improved service quality and heightened consumer satisfaction. It explores the theoretical underpinnings of VRE, integrating insights from anthropology, sociology, and communication studies. This interdisciplinary approach enables the paper to demonstrate VRE's potential to offer deeper insights into service delivery, customer experiences, and employee performance. Additionally, the paper addresses the practical challenges and ethical considerations associated with VRE practice, emphasizing its transformative potential in reshaping hospitality and tourism research. This study is a pivotal contribution to the methodological innovation in the said fields, suggesting that VRE adeptly captures the nuanced subtleties of social dynamics, fostering industry advancement and excellence.

Keywords: Video reflexive ethnography; hospitality; tourism; service quality; customer experience; methodological innovation

Citation: Islam, M. S. (2024). Utilization of Video Reflexive Ethnography in Hospitality and Tourism Research. *Journal of Quality Assurance in Hospitality & Tourism*, 1-34. DOI: <https://doi.org/10.1080/1528008X.2024.2334715>

Title of the Article: 57

We need digital inquiries before arrival! Key drivers of hotel customers' willingness to pay premium

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Abstract

While prior research has examined various aspects of technology adoption, there is a limited focus on the specific dynamics of digital concierge services within the hospitality setting. Hence, the primary purpose of this paper is to examine the key drivers of willingness to pay for digital concierge services in Egyptian four-star hotels, with a particular emphasis on perceived value, usability, and the moderating effects of age and gender. Through a comprehensive survey of 624 potential customers and applying the Technology Acceptance Model, this paper repositions the concept of perceived usefulness as a central driver of user beliefs and intentions. Findings have implications for hotel managers, marketers, and industry professionals, offering guidance on enhancing user adoption and effectively communicating the advantages of digital concierge services to diverse customer segments. This research also sets the stage for future investigations into the evolving landscape of technology adoption within the hospitality industry.

Keywords: Digital inquiries; concierge apps; hotel customers; technology acceptance model; willingness to pay premium

Citation: Selem, K. M., Khalid, R., Raza, M., & Islam, M. S. (2023). We need digital inquiries before arrival! Key drivers of hotel customers' willingness to pay premium. *Journal of Quality Assurance in Hospitality & Tourism*, 1-23. DOI: <https://doi.org/10.1080/1528008X.2023.2280117>

Title of the Article: 58

Borrowing Constraints and Demand for Remedial Education: Evidence from Tanzania

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Abstract

We use a cash transfer to relax households' borrowing constraints, then elicit their willingness to pay for a remedial education programme offering tutoring and life skills training. Lottery losers were willing to pay 3,300 Tanzanian Shillings for the programme, which is 7% of per capita monthly expenditures. For those identified at baseline as able to borrow, willingness to pay increases by 3% upon winning a lottery prize of 3,200 Tanzanian Shillings. For those unable to borrow, willingness to pay increases by 27% upon winning the lottery. We conclude that borrowing constraints limit access to educational programmes, and may increase inequality of educational attainment.

Citation: Burchardi, K., De Quidt, J., Gulesci, S., & Sulaiman, M. (2024). Borrowing Constraints and Demand for Remedial Education: Evidence from Tanzania. *The Economic Journal*, 134(662), 2621-2637. DOI: <https://doi.org/10.1093/ej/ueae024>

Title of the Article: 59

What We Can Learn When Impacts Fail to Replicate: Lessons From an Empowerment Programme for Young Women in Tanzania

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Abstract

We evaluate the Empowerment and Livelihood for Adolescents programme that combines life and livelihood skills trainings with a safe space where young women can network and learn. The same multifaceted intervention was highly effective in raising adolescent girls' economic and social empowerment when implemented in Uganda. In contrast, this randomised evaluation, using panel data on more than 3100 adolescents, finds no programme impact on any

economic, health, or social outcomes in Tanzania. We propose implementation quality as one plausible explanation of why the programme's effectiveness could not be successfully replicated in Tanzania.

Keywords: ELA; adolescent girls' empowerment; replication; Tanzania

Citation: Buehren, N., Goldstein, M., Gulesci, S., Salcher, I., Sulaiman, M., & Yam, V. (2024). What We Can Learn When Impacts Fail to Replicate: Lessons From an Empowerment Programme for Young Women in Tanzania. *The Journal of Development Studies*, 60(8), 1200-1210. DOI: <https://doi.org/10.1080/00220388.2024.2337370>

Funding Information: We are grateful to the World Bank Umbrella Fund for Gender Equality, Nike Foundation, Youth Employment Network, and iiG for funding the research.

Title of the Article: 60

Clinical relevance of expanded quantitative urine culture in health and disease

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Abstract

Expanded quantitative urine culture (EQUC)" is an enhanced culture protocol for the detection of viable microbes in urine specimens. Using a large volume of urine and different sets of cultural conditions, EQUC is able to uncover a wide range of bacteria and fungi (yeasts) that were otherwise undetected by the standard urinary culture. In addition to common urinary pathogens, EQUC has been shown to detect emerging and new pathogens, and commensal microbiota. Although the usefulness of EQUC protocol in clinical set up has not yet been fully established, recent studies have demonstrated that EQUC can provide valuable information regarding symptom resolution, treatment responses and diagnosis of major urinary disorders including urinary tract infections, urinary incontinence and other lower urinary tract symptoms. EQUC may also help in evaluating the utility of beneficial microbiota as biotherapeutics. This narrative minireview describes the current research findings regarding the clinical utility of EQUC in characterizing the role of urinary microbiome and uropathogens in health and disease. The literature which are written in English, available on "PubMed" and contain any of the terms- "expanded quantitative urine culture", "enhanced quantitative urine culture" and "EQUC" in the abstracts were used as the source articles to prepare this minireview.

Keywords: expanded quantitative urine culture (EQUC), enhanced urine culture, urinary tract infection (UTI), urgency urinary incontinence (UUI), microbiome, urobiome, urine, bladder

Citation: Deen, N. S., Ahmed, A., Tasnim, N. T., & Khan, N. (2023). Clinical relevance of expanded quantitative urine culture in health and disease. *Frontiers in Cellular and Infection Microbiology*, 13, 1210161. DOI: <https://doi.org/10.3389/fcimb.2023.1210161>

Title of the Article: 61

Acceptability of a balanced energy protein (BEP) supplement for pregnant women in Bangladesh

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Abstract

Balanced energy protein (BEP) supplementation in pregnancy is recommended in the context of undernutrition for the reduction of small-for-gestational age neonates and stillbirths. To inform an effectiveness trial, we evaluated the acceptability of a packaged, ready-to-eat fortified BEP product among women of reproductive age and their health care providers (HCPs) in rural Bangladesh and explored the feasibility of adhering to daily supplementation. We implemented a formative study using focus groups discussions with women (n=29) and HCPs (n=17) to introduce the product and investigate components of acceptability. A “trials of improved practice” activity was conducted in subset of women (n=16) to evaluate adherence to BEP over a 2-week period, followed by focus group discussions to identify challenges with adherence and strategies employed. Contributors to BEP acceptability included the product’s sensory attributes, such as taste, smell and texture; the attractive packaging and informative labelling; and the perceived benefits of use. Participants also identified household and community level factors influencing the adoption of BEP, such as trust in the provider, cultural beliefs on supplement use in pregnancy, and family member tasting and approval. Over the 2-week period, women consumed over 80% of the supplements provided to them and identified strategies for adherence, including visual aids and reminders from family members or providers. HCPs recommended targeted communication messages for mothers-in-law to foster a supportive home environment. Findings informed changes to the BEP product to improve acceptability and shaped the content of communication messages to optimise adherence in a forthcoming effectiveness trial.

Keywords: acceptability, adherence, balanced energy protein supplement, Bangladesh, mixed methods, pregnancy nutrition, pregnant women

Citation: Zavala, E., Rahman, A., Kalbarczyk, A., de Boer, M., Khaled, N., Chakraborty, B., ... & Thorne-Lyman, A. L. (2024). Acceptability of a balanced energy protein (BEP) supplement for pregnant women in Bangladesh. *Maternal & Child Nutrition*, 20, e13587. DOI: <https://doi.org/10.1111/mcn.13587>

Funding Information: Bill and Melinda Gates Foundation

Title of the Article: 62

Assessing implementation outcomes for launching balanced energy protein supplementation: A formative study in rural Bangladesh

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Abstract

Balanced energy protein (BEP) supplementation is an efficacious intervention in pregnancy for improving birthweight

and is recommended by World Health Organization (WHO) in countries with high maternal undernutrition. Few countries have implemented BEP programmes due in part to high cost, lack of data on acceptability and feasibility, and complexity of delivery. We sought to address implementation gaps in BEP interventions through a formative study designed to understand implementation outcomes. We conducted 52 in-depth interviews and 8 focus-group discussions with married women of reproductive age, family members, health care providers and pharmacists in three unions of the Gaibandha district in rural Bangladesh. Interviews were translated and transcribed in English and analysed using an analytic framework for implementation science in nutrition. BEP was viewed as an acceptable and appropriate intervention to combat undernutrition in this setting. There was a lack of clarity on who should or could be responsible for providing/distributing BEP in a way convenient to mothers. Many participants preferred door-to-door delivery and thought this approach could address social and gender inequities, but providers mentioned already being overworked and worried about adding new tasks. Participants were concerned about the affordability of BEP and opportunity costs associated with travel to proposed distribution sites such as ANC or pharmacies. Women in these communities do not always have the agency to travel without supervision or make purchasing decisions. BEP supplementation is a complex intervention; future trials seek to assess ways to overcome these implementation challenges and inform a long-term systems-owned BEP intervention.

Keywords: ANC, Bangladesh, implementation, nutrition, supplement

Citation: Kalbarczyk, A., de Boer, M., Khaled, N., Chakraborty, B., Rahman, A., Zavala, E., ... & Thorne-Lyman, A. (2024). Assessing implementation outcomes for launching balanced energy protein supplementation: A formative study in rural Bangladesh. *Maternal & Child Nutrition*, 20, e13606. DOI: <https://doi.org/10.1111/mcn.13606>

Funding Information: Bill and Melinda Gates Foundation

Title of the Article: 63

Impact of COVID-19 on celebration of death, mortuary, and funerary customs in Bangladesh: A qualitative study

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Abstract

Introduction: During the COVID-19 pandemic, restrictions significantly impacted religious activities related to death celebrations, mortuary practices, and funerary rituals in Bangladesh. Bereaved families faced a harsh reality, unable to perform the full rituals for their loved ones due to the pandemic outbreak. This study explores the adjustments and modifications made in cultural rituals and how they affected bereaved families and close relatives.

Objective: This study aims to explore how the COVID-19 pandemic impacted the observance of death rituals in Bangladesh and the effects on bereaved families and close relatives.

Methods: This study employed a qualitative approach and gathered data through 3 key informant interviews (KIIs) and 58 in-depth interviews (IDIs) conducted between December 2020 and January 2021. Purposive sampling was employed to recruit participants from three distinct groups: (1) individuals who had experienced the death of a

relative during the pandemic, (2) caregivers who provided support to those experiencing loss, and (3) volunteers actively involved with funeral and burial services. This selection strategy ensured a diverse range of perspectives on the impact of the pandemic on death rituals.

Results: The pandemic forced people to observe funerals or make significant sacrifices to traditional practices reluctantly. Disruptions to long-standing traditions and widespread emotional toll were as various segments of society struggled to find closure in saying goodbye to loved ones. Due to the severity of the pandemic, people became heavily reliant on priests, crematorium workers, and funeral volunteers for mortuary services. Both Hindu and Muslim religions discouraged family gatherings during post-burial rituals. The fear of contracting the virus further limited bereaved families' ability to bid farewell to their deceased loved ones properly.

Conclusion: This research highlights the profound impact of the pandemic on death rituals and the resulting emotional distress for bereaved families in Bangladesh. The findings are pivotal in guiding the development of concrete policies for future pandemic preparedness and response. Such policies might encompass guidelines for safe and culturally sensitive mortuary practices, psychosocial support and grief counseling initiatives for affected communities, and strategies to mitigate religious anxieties during public health emergencies.

Keywords: COVID-19 pandemic, Celebration of death, Transition in tradition, Emotional reaction, Qualitative, Bangladesh

Citation: Rahman, M. A., Islam, M. R., Chowdhury, M., Asaduzzaman, M., Barua, P., & Haque, M. A. (2024). Impact of COVID-19 on celebration of death, mortuary, and funerary customs in Bangladesh: A qualitative study. *Heliyon*, 10(9). 10(9), e30369. DOI: <https://doi.org/10.1016/j.heliyon.2024.e30369>

Title of the Article: 64

An End-to-End Lightweight Multi-Scale CNN for the Classification of Lung and Colon Cancer with XAI Integration

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Abstract

To effectively treat lung and colon cancer and save lives, early and accurate identification is essential. Conventional diagnosis takes a long time and requires the manual expertise of radiologists. The rising number of new cancer cases makes it challenging to process massive volumes of data quickly. Different machine learning approaches to the classification and detection of lung and colon cancer have been proposed by multiple research studies. However, when it comes to self-learning classification and detection tasks, deep learning (DL) excels. This paper suggests a

novel DL convolutional neural network (CNN) model for detecting lung and colon cancer. The proposed model is lightweight and multi-scale since it uses only 1.1 million parameters, making it appropriate for real-time applications as it provides an end-to-end solution. By incorporating features extracted at multiple scales, the model can effectively capture both local and global patterns within the input data. The explainability tools such as gradient-weighted class activation mapping and Shapley additive explanation can identify potential problems by highlighting the specific input data areas that have an impact on the model's choice. The experimental findings demonstrate that for lung and colon cancer detection, the proposed model was outperformed by the competition and accuracy rates of 99.20% have been achieved for multi-class (containing five classes) predictions.

Keywords: convolutional neural network; cancer classification; deep learning; explainable artificial intelligence; Gradio; gradient-weighted class activation mapping; lightweight; Shapley additive explanation

Citation: Hasan, M. A., Haque, F., Sabuj, S. R., Sarker, H., Goni, M. O. F., Rahman, F., & Rashid, M. M. (2024). An end-to-end lightweight multi-scale CNN for the classification of lung and colon cancer with XAI integration. *Technologies*, 12(4), 56. DOI: <https://doi.org/10.3390/technologies12040056>

Title of the Article: 65

Livelihood challenges of single female household heads in the Rohingya and host communities in Cox's Bazar, Bangladesh during the COVID-19 pandemic

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Abstract

Following the mass influx of Rohingya refugees into Cox's Bazaar, Bangladesh in 2017, makeshift settlement camps in Ukhiya and Teknaf have been overburdened, leading to livelihood challenges for both Rohingya and host communities. The humanitarian crisis has had adverse effects on vulnerable populations, which include older people, persons with disabilities, adolescents, and single female household heads. Using a subset of a larger dataset on households with most vulnerable groups in both communities, we analysed the effect of the pandemic and lockdown on the livelihood of single female household (HH) heads.

Methods: A cross-sectional household roster survey was designed to collect data from households with most vulnerable groups (MVGs) of host and Rohingya communities from December 2020 to March 2021; 11 host community villages and 10 Rohingya camps purposively selected as per the affiliated intervention of the project. The paper analysed quantitative and qualitative data from the sub-group of single female household heads without any income/low income. Participants were surveyed for their socio-demographic characteristics, COVID-19 experiences and knowledge, food security situation, social experiences and mental health using PHQ-2 test for depression.

Results: We surveyed 432 single female HH heads. Support during the pandemic was reported to be low, with less than 50% of HHs reporting relief meeting their needs; only 36% and 15% of these HHs received rations in camps

and host communities respectively. Loan facilities were mostly unavailable and there were reported insufficiencies in food consumption. Over 50% of respondents tested positive on the PHQ-2, a scale used to screen for depression. Further analyses indicates that having a chronic health issue (OR 2.2, 95% CI 1.33–3.66) was positively associated with the PHQ-2 score for Rohingya single females. For host single females, having an ill member in the HH (OR 1.46, 95% CI 1.02–2.08) and the inability to save before the pandemic (OR 1.57 95% CI 1.11–2.23) increased the odds of screening positive for depression.

Conclusion: Our study findings revealed insufficiencies with economic opportunities and food security for single female-headed households, as well as a high rate of positive screening for depression amongst this population. These findings call for a more in-depth understanding of the needs of this group.

Keywords: Humanitarian crises, Humanitarian health, Single female household heads, Livelihood, Mental health, Bangladesh

Citation: Nasar, S., Nadim, A. S. M., Raz, S., Jabbar, A., Hossain, M. R., Aktar, B., ... & Rashid, S. F. (2023). Livelihood challenges of single female household heads in the Rohingya and host communities in Cox's Bazar, Bangladesh during the COVID-19 pandemic. *BMC Public Health*, 23(1), 2084. DOI: <https://doi.org/10.1186/s12889-023-16964-2>

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Title of the Article: 66

Understanding the impacts of COVID-19 pandemic on mental health and well-being among university students in Dhaka, Bangladesh: A nested mixed-methods study

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Abstract

Background: University students are more at risk of mental illness compared with the general population. Declaration of a global COVID-19 pandemic led the Bangladesh government in March 2020 to implement a national lockdown, home quarantining, social distancing measures, and closure of educational institutions. We aimed to explore the impact of lockdown on the mental health and well-being of university students in Bangladesh.

Methods: A nested mixed-methods survey design was undertaken using a semi structured questionnaire and in-depth interviews conducted by telephone of 73 university students (mean age of 22 years, range 18 to 26-years-old) attending public and private academic institutions in Dhaka. A questionnaire was developed de-novo and pre-tested. Qualitative, open-ended questions were used to understand experiences regarding students' mental health and well-being, their perceptions of COVID–19, and coping strategies.

Results: Fifty nine percent of students reported that lockdown had a significant impact on their mental health and well-being. They described difficulties with social isolation and loneliness, motivation, and interpersonal conflict within families. Students' knowledge of COVID-19 were high with television, newspapers, online, and social media were main sources of information; few relied on government reports. Most pressing concerns were timely graduation and

employment (83%), not being able to socialize (46%), being stuck at home (37%), and financial difficulties regarding university fees (29%). Additional underlying stressors included financial insecurity of respondents' households and parental health. Coping strategies included watching television or films, online meetings with friends, social media, as well interactions with family.

Conclusion: As a result of Bangladesh's first national lockdown, university students experienced negative effects on their mental health and well-being. There is an urgent need for greater proactive measures within educational settings, such as mental health literacy programmes and diagnosis management that could mitigate and prevent adverse impacts of future lockdowns.

Keywords: University students Mental health COVID-19 Well-being Fears Behaviour Lockdown Bangladesh

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Title of the Article: 67

Wavelength selective beam-steering in a dual-mode multi-layer plasmonic laser

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Abstract

Due to its improved localization and confinement of light in single or multiple wavelength modes, nanolasers based on plasmonic crystals have grown in popularity in recent years. However, the lasing modes are not spatially separated, making applying different modes to different applications difficult. This work demonstrates an effective technique for spatially separating the two modes of a merged lattice metal nanohole array-based dual-mode plasmonic laser. A flat dielectric metasurface-based beam-splitter that exploits phase gradient profiles on the interfaces has been added to the laser to separate the modes into distinct spatial beams. The proposed structure successfully separates two modes by $\sim 23^\circ$, and the separation can be raised to $\sim 63^\circ$ by tuning structural parameters such as the radius of the nanocylinders and the number of supercell rows. In addition, multiple beams can be generated, allowing for manual beam steering. This approach has a high emission output with a narrow linewidth, clarity, and a substantial degree of future tunability potential. The proposed integrated structure will provide a novel means of device miniaturization and may also serve advanced optical applications such as optical communication, quantum optics, interferometry, spectroscopy, and light detection and ranging (LiDAR).

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A qualitative exploration of challenges in childhood TB patients identification and diagnosis in Bangladesh

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Abstract

Background: As childhood tuberculosis is difficult to identify and diagnose, the experiences of the caregivers and healthcare providers of childhood tuberculosis patients remain a potential area of study. This study aims to illustrate the challenges caregivers and healthcare providers encounter in identifying and diagnosing childhood tuberculosis in two sub-districts of Bangladesh.

Methods: We conducted semi-structured in-depth interviews with eight caregivers of childhood tuberculosis patients and key informant interviews with 36 healthcare providers from September 2020 to December 2020 from different levels of the tuberculosis control program in Keraniganj (with high childhood tuberculosis cases notification), Faridpur Sadar (with low childhood tuberculosis cases notification), and Dhaka city.

Results: There is a dearth of understanding among caregivers about childhood tuberculosis. Passive case finding process and focus on cough during community mobilisation contribute to the delay in childhood tuberculosis identification. The stigmatisation that caregivers anticipate and experience has an impact on their mental health and implies that there are misunderstandings about tuberculosis in the community. Furthermore, diagnostic dilemma among healthcare providers accounts for diagnosis delays. Some, but not all, institutions in different geographical locations provide free diagnostic tests and have GeneXpert devices.

Conclusions: Various factors, including caregivers' knowledge and experience, the process of case finding and community mobilization, healthcare providers' way of service provision and diagnosis, and the unavailability of required logistics at facilities challenge the identification and diagnosis of childhood tuberculosis that need to be minimized for childhood tuberculosis's early identification, diagnosis, treatment initiation, and successful completion of treatment. Awareness should also be raised in the community of childhood tuberculosis.

Keywords: Caregiver, Healthcare provider, Experience, Childhood TB, Tuberculosis, Bangladesh

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Title of the Article: 69

A scoping review on integrated health campaigns for immunization in low- and middle-income countries

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Abstract

Health campaign integration is a key implementation strategy outlined by the World Health Organization to achieve universal health coverage. This scoping review synthesizes the evidence on Integrated Health Campaigns (IHC) in the field of immunization in low- and middle-income countries (LMICs) regarding the most common strategies, facilitators and barriers. Four reviewers followed a systematic approach to identify, screen and analyse relevant articles. The team used three search engines (PubMed, Scopus and Google Scholar) to identify peer-reviewed journal articles as well as select institutional websites for grey literature publications. Full-text articles using any study design and across any time frame were included. Data were extracted following a predefined matrix, analysed deductively and presented in a narrative synthesis. Thirty articles (20 academic and 10 grey) were included in the final review. All studies included identified IHCs as effective when planning or implementation is integrated. The common strategies were: using resources efficiently in remote locations; using national immunization days to maximize impact; targeting specific age groups by selecting intervention sites that are frequented by that age group; building community ownership over the integrated program; and integrating programs that already share common elements. The key facilitators were: closing the gap between services and communities; planning, coordination and resource management both before and during integration; cost-effectiveness; and utilization of pre-existing infrastructure. The common barriers included seemingly optimized initial cost to appear feasible only in the short term and additional responsibilities on the field staff. This review finds IHCs a common practice in immunization and identifies gaps in evidence on evaluation; indicating the need for additional research. Strong evidence accounts IHCs to increase coverage, improve community acceptance of health services and strengthen the community models of health service delivery.

Keywords: Integrated health campaign, immunization, integration, service delivery, implementation, low- and middle-income countries, scoping review

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Title of the Article: 70

Maternal misperception of under-five children weight status and associated factors: A cross-sectional study

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Abstract

Maternal perceptions, about the nutritional status of their children, may have implications for timely health care seeking and feeding behaviour. Shreds of evidence are limited in this area that assessed maternal perception about the nutritional status of the children in the context of Bangladesh. The objective of this study is to assess the differences in mothers' perceptions about their children's nutritional status who are less than 5 years of age and their associated factors in the context of urban slum areas. A cross-sectional study (Quantitative approach) was conducted in two of the largest urban slums of Dhaka city. A total of 437 mother–children dyads were included in the final analysis. The outcome of interest was the mother's 'varied perceptions' regarding the nutritional status of their children under five. 'Varied perception' refers to the difference between a mother's subjective assessment of her child's nutritional condition and the anthropometrically measured nutritional status. The prevalence of mother's varied perceptions was around 46%, and among them, 37% of mothers underestimated and 9% overestimated their child's nutritional status. 'The child doesn't want to eat' (AOR=3.69; 95% CI: 2.34–5.85; $p<0.001$) and 'Feels light when carried' (AOR=3.39; 95% CI: 1.69–6.81; $p=0.001$) were the significant reasons behind the mother's perception about the nutritional status of their under-five children. About one in two mothers' perceptions about their children varied from the anthropometry-derived status. Various research findings indicate that providing health education on proper feeding practices for children, along with anthropometric measurements, can assist mothers in enhancing their understanding and assessing their child's nutritional status with greater accuracy. Further qualitative research may be instrumental in getting deeper insights into maternal perception to develop context-specific interventions.

Keywords: children, maternal perception, nutrition, overweight, underweight

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In silico design and evaluation of multi-epitope dengue virus vaccines: a promising approach to combat global dengue burden

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Abstract

Dengue virus, a pervasive mosquito-borne pathogen, imposes a substantial global health burden and is responsible for numerous fatalities annually globally, with tropical and sub-tropical regions particularly susceptible to dengue outbreaks. Despite decades of efforts, there has been no effective treatment or prevention for dengue, which makes it a life-threatening disease. Hence, this study proposes an innovative bioinformatics-driven approach to construct a vaccine targeting the dengue virus. The study involved a comprehensive analysis of conserved regions of dengue virus serotypes 1–4's non-structural proteins (NS1, NS3, and NS5) and structural protein (E) to predict the potential B & T-cell epitopes which were linked with appropriate adjuvants and linkers to generate four distinct vaccine candidates. The constructed vaccine models underwent rigorous evaluation, considering physicochemical attributes, structural integrity, population coverage, and immune system response through simulation. The results confirm that these vaccine candidates are non-allergenic, non-toxic, antigenic, and immunogenic. Additionally, they exhibit 99.70% world population coverage and 100% conservation across all dengue strains, which is crucial for vaccine efficacy. A Ramachandran plot showed that 95.6% of the amino acid residues of the candidates belong to the optimal zone, while around 4% are in additional allowed regions. Further, molecular docking and dynamic simulation of interaction with the human toll-like receptor 4, a fundamental component of innate immunity, was carried out to gain more insight into interaction dynamics. As a result of these analyses, the candidates' binding dynamics and structural stability were revealed. Overall, this study presents promising vaccine candidates for addressing dengue's global health burden. Their robust design and demonstrated immunogenicity make them attractive candidates for further experimental testing and development as potential vaccines against current strains and future variants.

Keywords: Dengue virus, Linkers, Epitope, Antigen, Docking, Immune simulation, Vaccine

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