UUM
Universiti Utara Malaysia

icoci

International Conference on

10TH COMPUTING & INFORMATICS

25 - 27 JUNE 2025

MEDAN, INDONESIA

https://soc.uum.edu.my/icoci/2025/

PROGRAM & ABSTRACT

Beyond Binary: AI, Humanity, and The Dawn of IR 5.0

ORGANIZED BY

Pusat Pengajian Pengkomputeran
School of Computing
Universiti Utara Malaysia

SUPPORTING PARTNERS

Faculty of Science and Technology
Universitas Islam Negeri Sumatera Utara Medan

جامعة التقنية والعلوم التطبيقية
University of Technology and Applied Sciences
Muscat
AI and Data Science Research Group
Department of Computing and Information Sciences

COLLABORATORS

Jurnal Online Informatika

UIN Universitas Islam Negeri Sunan Gunung Djati Bandung

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FOREWORD BY THE VICE CHANCELLOR

It is with heartfelt appreciation and immense pride that I extend a warm and cordial welcome to all participants of the 10th International Conference on Computing and Informatics (ICOCI 2025), proudly hosted by the School of Computing, Universiti Utara Malaysia (UUM).

Since its inception in 2006, ICOCI has grown in stature and significance, evolving into a distinguished academic platform that brings together eminent scholars, researchers, and professionals from across the globe. This esteemed conference serves not only as a nexus for the exchange of ideas and dissemination of knowledge, but also as a catalyst for innovation and intellectual exploration in the dynamic fields of computing and informatics.

The theme of this year's conference, *"Beyond Binary: AI, Humanity, and The Dawn of IR 5.0,"* captures the essence of a transformative era – one where the boundaries between human experience and digital intelligence are increasingly becoming intertwined. Artificial intelligence (AI) is no longer confined to laboratories or theory—it is a present and powerful force, revolutionising how we learn, govern, communicate, and navigate our everyday decision-making. As we collectively stand on the cusp of the 5th Industrial Revolution (IR5.0), the true test lies not only in harnessing the immense power of AI but in doing so with wisdom, responsibility, and a deep moral compass.

At UUM, we embrace this formidable challenge with a sense of purpose and unwavering commitment. As Malaysia's eminent management university, we believe that technological progress goes hand in hand with visionary leadership, ethical stewardship, and a deep-rooted commitment to societal well-being. The ability to manage innovation is just as vital as the genius to create it. Our mission is to cultivate graduates and foster research that champions a people-centred approach – where technology serves as a force for inclusive, meaningful change.

We are profoundly honoured that the 10th edition of ICOCI is taking place on a global stage, with participants from across the globe. This international gathering reflects UUM's unwavering dedication to global academic engagement and its role in shaping critical conversations on the future of technology.

To all participants—especially students and emerging scholars—I urge you to seize the full potential of this conference. Engage earnestly in discourse, challenge prevailing assumptions, and forge enduring networks that transcend borders. Together, let this be a venue not only for sharing knowledge but for reimagining the possibilities of a world where technology serves not just progress - but people.

May your time at ICOCI 2025 prove to be intellectually enriching, deeply inspiring, and truly memorable.

Warm regards,
Professor Dato' Dr. Mohd Foad Sakdan
Vice-Chancellor
Universiti Utara Malaysia

FOREWORD BY THE RECTOR

Assalamu'alaikum Warahmatullahi Wabarakatuh,

Let us begin by praising Allah SWT, the Almighty, for granting us the opportunity to gather at this prestigious academic forum: The *International Conference on Computing and Informatics (ICOCI) 2025*, with the theme *"Beyond Binary: AI, Humanity, and The Dawn of IR 5.0."*

This conference reflects our collective mission to develop technology that respects human dignity, ethics, and values. Universitas Islam Negeri Sumatera Utara (UINSU) is honored to be a part of this global dialogue. As one of Indonesia's leading Islamic State Universities (PTKIN), UINSU has achieved "Unggul" (Excellent) accreditation from the National Accreditation Board, and is actively strengthening its international standing.Some of our latest achievements include Ranked 8 among Islamic universities in Indonesia according to Webometrics (2024), and currently progressing toward inclusion in the QS World University Rankings: Asia 2025. These reflect our growing commitment to research, global networking, and academic excellence.

In this journey, our partnership with Universiti Utara Malaysia (UUM) has been a strategic cornerstone, fostering mutual growth in education, research, and community empowerment. This conference is more than just an academic meeting. It is a strategic momentum that brings together global thinkers to reflect on the future direction of technology, particularly Artificial Intelligence and its profound impact on humanity in this era of the Fifth Industrial Revolution.

On behalf of Universitas Islam Negeri Sumatera Utara (UINSU), I express my deepest gratitude and appreciation to our esteemed partner, Universiti Utara Malaysia (UUM), especially to Prof. Dato' Dr. Mohd Foad Sakdan, for the continuous collaboration and mutual trust we have built over the years.

Our partnership has significantly grown across the three pillars of higher education:

1. Education, through student and faculty exchange programs,
2. Research, via international research projects and joint publications,
3. Community Engagement, by conducting shared initiatives that strengthen the social contribution of our institutions.

Looking forward, we are optimistic that this collaboration will expand even further, not only in academia but also in ethical technology innovation, AI curriculum development, and in promoting AI that is not only intelligent but also compassionate and morally grounded.

UINSU is committed to being part of the global movement to ensure that technological advancements uphold humanity, spirituality, and social justice—values that are at the heart of Islamic education.

Finally, I wish you a fruitful and inspiring conference. May ICOCI 2025 spark greater international cooperation and generate transformative ideas to meet the challenges of our time.

Thank you.

Prof. Dr Hjh. Nurhayati, M.Ag
Rector
Universitas Islam Negeri Sumatra Utara

FOREWORD BY THE DEAN & ASSISTANT VICE CHANCELLOR

It is a great honour to welcome all delegates, presenters, and guests to the 10th International Conference on Computing and Informatics (ICOCI 2025), hosted by the School of Computing, Universiti Utara Malaysia. Since its establishment in 2006, ICOCI has provided a valuable platform for academics, researchers, and practitioners to come together to share insights, present discoveries, and explore the evolving landscape of computing and informatics.

This year's theme, *"Beyond Binary: AI, Humanity, and The Dawn of IR 5.0,"* invites us to reflect on the accelerating role of technology—particularly artificial intelligence—and how it intersects with humanity. Emerging technologies such as AI and machine learning, quantum computing, blockchain, AR/VR, cybersecurity, and edge computing are no longer distant frontiers—they are becoming integral to how we live, work, and solve problems. The challenge is not only to understand and innovate but also to ensure these technologies are applied responsibly and inclusively.

At the School of Computing and across the College of Arts and Sciences (CAS) at UUM, we uphold the principle that research must serve a greater purpose. We believe that innovation should be directed toward the betterment of communities and society. Whether in health, education, governance, or the environment, the work we do in our labs and lecture halls should translate into real-world solutions that empower people and improve lives.

ICOCI 2025 is not only a venue for presenting research, but it is also a space for building new academic and professional networks. By bringing together local and international participants, we aim to foster lasting collaborations that will drive innovation, enhance research capacity, and pave the way for future partnerships. We are hopeful that the connections made during this conference will lead to joint projects, interdisciplinary approaches, and impactful outcomes long after the event concludes.

I extend my heartfelt thanks to all contributors—keynote speakers, presenters, reviewers, and the organising committee—for making this conference possible. May ICOCI 2025 be a catalyst for ideas, partnerships, and innovations that shape a better and more connected future.

Warm regards,
Professor Dr. Osman Ghazali
Dean, School of Computing
Assistant Vice-Chancellor, UUM College of Arts and Sciences (CAS)
Universiti Utara Malaysia

FOREWORD BY THE DEAN

Assalamu'alaikum Warahmatullahi Wabarakatuh,

Let us praise Allah SWT, for His blessings that allow us to gather in this prestigious scientific forum: The International Conference on Computing and Informatics (ICOCI) 2025. This is an important momentum to strengthen international academic synergy across institutions and disciplines.

I extend my highest appreciation to our Rector for her leadership and strong support in promoting international collaboration within the Faculty of Science and Technology. Our conference theme, *"Beyond Binary: AI, Humanity, and The Dawn of IR 5.0,"* invites us to go beyond the technical, towards the ethical and humane dimensions of technology.

Our collaboration with Universiti Utara Malaysia (UUM) has been fruitful and growing. One of the highlights was the International Visiting Lectures held on March 12, 2025, where expert lecturers from UUM delivered valuable sessions on AI, data management, and digital innovation to our faculty and students. We have also embarked on joint research and co-publication initiatives, faculty and student exchange programs, international seminars and workshops co-hosted by both institutions. This partnership is not merely ceremonial, it contributes directly to improving the academic quality and global competitiveness of our faculty. In the near future, we aspire to develop double-degree programs, curriculum innovation aligned with IR 5.0, including digital ethics, a joint research centre on AI and Ethics and regular international conferences and symposia.

As Dean of the Faculty of Science and Technology, I invite all of you to see this conference not just as a platform for research dissemination, but also as a starting point for long-term academic collaboration. Finally, I thank all organizing committees from School of Computing (SOC) UUM and Faculty of Science and Technology (FST) UINSU for your tireless efforts and unwavering collaboration spirit.

Thank you.

Dr. Zulham, S.H.I., M.Hum.
Dean
Faculty of Science and Technology
Universitas Islam Negeri Sumatera Utara

FOREWORD BY THE CONFERENCE CHAIR

It is both an honour and a heartfelt moment for me to welcome you to the 10th International Conference on Computing and Informatics (ICOCI 2025). ICOCI is not just a conference I attend—it is a conference that I have consistently organised and poured my heart, mind, and full effort into since its very first edition in 2006. Over the years, it has become a platform I am deeply proud of, one that connects researchers, nurtures innovation, and promotes meaningful academic exchange across borders.

Since the first ICOCI in 2006, held in Kuala Lumpur, I have had the privilege of being deeply involved in the organisation of nearly every edition, primarily serving as part of the conference secretariat and, in later years, as the conference chair. While I missed 2009 in Kuala Lumpur and 2011 editions in Bandung, Indonesia, I have actively contributed to the rest—including Kuching (2013), Istanbul (2015), Kuala Lumpur (2017 and 2023), Bangkok (2019), and our fully virtual edition in 2021, due to global travel restrictions. Now, in 2025, we are proud to return to Indonesia, continuing ICOCI's tradition of international reach and impact.

This year's theme, *"Beyond Binary: AI, Humanity, and The Dawn of IR 5.0,"* invites us to critically examine the role of technology in shaping the world around us. The field of Information and Communication Technology (ICT) is evolving at an unprecedented pace. From AI and machine learning to blockchain, quantum computing, natural language processing, and augmented and virtual reality, we are witnessing innovations that redefine how we live, work, and connect.

But with such rapid growth comes responsibility. As researchers and academics, we cannot operate in silos or walk this path alone. The value of our work grows when we collaborate, connecting across disciplines and borders, and when we pursue knowledge not only for publication or institutional prestige but also for real-world impact, wisdom, and the common good.

ICOCI is more than a conference. It is a platform for building lasting academic relationships, for sharing research that matters, and for nurturing a spirit of global cooperation. I am deeply thankful to our co-organisers—Universitas Islam Negeri Sumatera Utara (UINSU), Universitas Islam Negeri Sunan Gunung Djati Bandung, and the University of Technology and Applied Sciences, Oman—for joining us in this shared mission.

This year, we received 84 submissions, and we are pleased to have accepted 66 high-quality manuscripts from scholars representing Malaysia, Indonesia, Oman, Libya, Iraq, the United Kingdom, China, Saudi Arabia, Nigeria, Jordan, Tunisia, and Türkiye. This diverse

representation reflects the growing trust in ICOCI as a truly international and inclusive academic platform.

To all presenters, participants, and partners—thank you for your continued support. I hope ICOCI 2025 will offer not only academic enrichment, but also meaningful dialogue, new collaborations, and shared inspiration for the future.

Warmest regards,
Assoc. Prof. Ts. Dr. Norliza Katuk
Conference Chair
ICOCI 2025

BIOGRAPHY OF KEYNOTE SPEAKER 1

PROFESSOR DR ALAN DIX

Director of Computational Foundry
Swansea University, Wales

Professor Alan started off as mathematician and later works on most things that connect people and computers. He is the Director of the Computational Foundry, and the mission of the Foundry very much matches his own personal goals, i.e. to do world-class research that makes a difference to real people. In Alan's own career this has included seminal work in human–computer interaction (HCI), including one of the core textbooks in the area, foundational work on formal methods and the user interface, and the earliest academic papers on mobile interfaces, on privacy and on gender and ethnic bias in machine learning. In 2013 he was elected as a member of the ACM SIGCHI Academy, one of the highest accolades for research in HCI. However, he has also been involved in a wide variety of practical commercial and non-commercial applications including agricultural sprayers, submarine design, educational technology, intelligent internet interfaces, and technology for rural communities. His techniques are often eclectic, not least his one thousand mile walk around the perimeter of Wales that combined a technical investigation of technology at the margins, with more philosophical and artistic exploration. He has also written and taught academically and practically about technical creativity. He contributes occasional guest lectures on a number of topics and also create online materials as part of wider mission to the academic and practitioner community.

BIOGRAPHY OF KEYNOTE SPEAKER 2

PROFESSOR DR IR. RIRI FITRI SARI

Professor of Computer Engineering
University of Indonesia

Professor Dr Ir. Riri Fitri Sari is a Professor of Computer Engineering at the Electrical Engineering Department, Faculty of Engineering, University of Indonesia (UI). She was the CIO/Head of Information System Development and Services of the University of Indonesia from 2006-2014. She holds a PhD in Computer Networks from University of Leeds, UK. Her PhD research was on Active Networks-based Congestion Control Protocols. Her current main teaching and research area includes Computer Network, Grid Computing, and ICT implementation. Her outstanding achievements include the recipient of the 2009 Most Outstanding Lecturer at the University of Indonesia, the IEEE WIE Most Inspiring Engineer Award in 2012, the 3rd Winner of the National Selection of the Most Outstanding Lecturer hold by the Ministry of National Education of Republic of Indonesia in conjunction with the 64th National Independence Day, an Inspiring Woman and Youth 2012 from PT Indosat, Kartini 2.0 Woman Technologist from PT Telkom in 2013 and Distinguished Toastmaster (DTM) from the Toastmaster International. She is a member of Special Task Force for Improving Indonesian Universities Academic Reputation of the Ministry of Research and Higher Education and a Senior Member of the Institute for Electronics and Electrical Engineers (IEEE). She involved in a joint research at CERN (European Laboratory for Particle Physics) in Geneve, a training in Engineering Education funded by UNESCO in Australia, higher education management training in Japan (JICA), and being an invited speaker in Korea (KAIST). Professor is a reviewer for many competitive grant schemes of Higher Education Directorate General of Ministry of National Education, Ministry of Information and Communication Technology, National Research Board and Directorate General of Population Administration of the Ministry of Internal Affairs. Playing piano, reading novels and swimming are her hobbies.

CONFERENCE SCHEDULE

DAY 1 – 25th June 2025 (Wednesday)		Venue
09:00	Registration	Lobby, Ground Floor
10:00	Opening Ceremony	Ballroom 2, Ground Floor & Online*
12:00	Keynote address 1 Prof. Dr Alan Dix Director of Computational Foundry, Swansea University, Wales	
13:00	Luncheon	Benteng Restaurant
14:30	Parallel Session A1	Ballroom 2A
	Parallel Session A2	Ballroom 2B
DAY 2 – 26th June 2025 (Thursday)		
08:00	Parallel Session B1	Ballroom 3A
	Parallel Session B2 (Online)	Ballroom 3B
12:00	Keynote address 2 Prof. Dr Ir. Riri Fitri Sari Professor of Computer Engineering, University of Indonesia, Indonesia	Ballroom 3A
13:00	Luncheon	Benteng Restaurant
14:30	Parallel Session C1	Ballroom 3A
	Parallel Session C2 (Online)	Ballroom 3A
	Parallel Session C3 (Online)	School of Computing
DAY 3 – 27th June 2025 (Friday)		
09:00	Networking – Free and Easy	

* https://uum.webex.com/meet/chareen

PARALLEL SESSION SCHEDULE

25th June 2025 | Session A1 | 14:30 – 18:00

Human-Computer Interaction, Accessibility & User Experience/Smart System, IoT & Emergence Technologies

Chair: Cik Fazilah Hibadullah
Venue: Ballroom 2A

Time	PID	Title
14:30	168	WI-LOCATE: Innovative Design and Development of Location Finder for Visually Impaired Ahmad Hanis Mohd Shabli, Noorulsadiqin Azbiya Yaacob & Ir. Firdaus Hakim Jalaludin
14:50	180	Games as Educational Media to Enhance Children's Knowledge in Waste Sorting: A Development Process Hanhan Maulana, Herman S. Soegoto, Irfan Dwiguna Sumitra, Rifqi A Zaidan, Noraziah ChePa, Nur Azzah Abu Bakar & Azham Hussain
15:10	190	Gaming for A Greener Future: The Power of Games in Inspiring Eco-Awareness in Malaysian and Indonesian Schools Noraziah ChePa, Nur Azzah Abu Bakar, Azham Hussain, Hanhan Maulana, Herman S. Soegoto, Irfan Dwiguna Sumitra & Laura Lim Sie-Yi
15:30	196	Designing Tangible User Interfaces for Neurodiversity: A Focus on Dyslexia-Friendly Features Husniza Husni, Nurul Izzah Abdul Aziz, Nor Laily Hashim & Ilka Zufria
15:50	202	AI vs Human Judgment: A Comparative Analysis of Mybuddy Application and Manual Assessment in Predicting At-Risk Students Noraziah ChePa, Ahmad Hanis Mohd Shabli, Azizi Ab Aziz, Wan Hussain Wan Ishak & Laura Lim Sie-Yi
16:10	209	Effectiveness of Games as Tools for Dyslexia Intervention: Evaluation of DysPRex and MazeDyslexic Nur Azzah Abu Bakar, Noraziah ChePa & Mohd Adan Omar
16:30	211	Enhancing Asnaf Care Through an Augmented Reality Mobile Application Azizah Che Omar, Norhana Yusof & Mohd Adib Abd Muin
16:50	225	Signlearn: Application for Learning Sign Language Cik Fazilah Hibadullah, H'ng Zi Ling & Maslinda Mohd Nadzir

25th June 2025 | Session A2 | 14:30 – 18:00

AI, Data & Digital Transformation in Higher Education & Society/ AI & Machine Learning for Health, Well-being & Human Behaviour

Chair: Dr Ruziana Mohamad Rasli
Venue: Ballroom 2B

Time	PID	Title
14:30	163	Assessment of The Efficacy of a Training Program to Improve Teaching and Learning Strategies Related to Distance Learning Qasim AlAjmi, Hamed Alyahmadi & Sami AlMazruii
14:50	169	User-Centered Development of a Trustworthy E-Voting Application for Student Elections Jefri Marzal, Suwannit Chareen Chit Sop Chit, A. Zarkasi & Niken Rarasati
15:10	173	Intelligent Chatbot for Student Feedback Analysis using Machine Learning Approach Lee Wie Jin, Zurida Ishak, Nurul Syafidah Jamil, Ahmad Subhi Zolkafly, Muhammad Dalvi Esfahani, Farina Saffa Mohamad Samsamnun, Nur Lyana Shahfiqa Albashah, Rohani Bakar & Ahmad Zaffry Hadi Mohd Juffry
15:30	187	Systematic Literature Review on Artificial Intelligence Integration in Educational Platforms Alawiyah Abd Wahab & Elgamar Syam
15:50	208	Mapping The Evolution of Real-Time Data Visualization: A Bibliometric Analysis of Scopus Publications Ruziana Mohamad Rasli, Sobihatun Nur Abdul Salam, Juhaida Abu Bakar, Fauziah Baharom & Roznim Mohamad Rasli
16:10	219	Prediction of Student Intake, Enrollment and Output (IEO) using Exponential Smoothing Methods for Analytics Dashboard: A Case Study of Malaysian Public Universities Suzilah Ismail, Juhaida Abu Bakar, Mohamed Ali Saip, Yuhanis Yusof, Mohd Hasbullah Omar, Muhammad Amirul Ariff Zulkifli & Nuratikah Jamaludin
16:30	226	A Preliminary Investigation on the Challenges and Enhancements for Flood Disaster Management Huda Ibrahim, Sariana Salleh, Fadzliana Razak, Nurihan Ariffin, Mazni Omar, Mazida Ahmad, Nur Suhaili Mansor, Amirulikhsan Zolkafli, Azman Yasin, Shah Fathin Syahirah Kamil, Muhamad Mahazi Hj. Ibrahim, Zairil Anuar Zulmuji

26th June 2025 | Session B1 | 08:00 – 12:00

AI & Machine Learning for Health, Well-being and Human Behavior/AI in Cybersecurity, Fraud Detection & Digital Trust

Chair: Dr Wan Mohd Yusoff Wan Yaacob
Venue: Ballroom 3A

Time	PID	Title
08:30	151	Enhancing Snort Rules in SQL Injection Detection using Fast Pattern and PCRE Noor Ashitah Abu Othman, Nur Athirah Noor Mohamad & Anis Shobirin Abdullah Sani
08:50	172	A Phishing Email Detection Model Based on Machine Learning Nur Suhaila Yeop, Nur Haryani Zakaria & Suendri
09:10	176	From Text to Therapy: A Continuous Sentiment Analysis Framework for Real-Time Mental Health Monitoring in Mobile Applications Ghaith Abdulsattar A. Jabbar Alkubaisi, Noora Yahya Al-Hoqani, Yusra Mohammed Al-Roshdi
09:30	181	Early Heart Disease Detection Based on Anomaly Behaviour in ECG Data using Cross-Correlation and Machine Learning Muhamad Ariff Izzudin bin Mohamat Zamri, Mohamad Sabri bin Sinal @ Zainal, Muhammad Nur Adilin bin Mohd Anuardi
09:50	188	Monitoring Land Surface Temperature Variations using Google Earth Engine: A Case Study of Urban Expansion in Perak (2019–2023) Nur Suhaili Mansor, Hapini Awang, Chong Kar Min, Anna Bluszcz & Shakiroh Khamis
10:10	195	Predictive Modelling of Software Team Performance Based on Gender and Task Complexity Using Logistic Regression and Decision Tree Mazni Omar, Ruqaya Gilal, Mawarny Md Rejab, Abdul Rehman Gilal, Abdullah Almogahed & Nurhanifah
10:30	216	Comparative Analysis of Machine Learning Algorithms for Malicious URL Detection Nurul Shakirah Othman, Norliza Katuk and Rakhmat Kurniawan
10:50	224	A Model of Secure Behavioural Intentions in the Context of Online Game Addiction: Insights from Malaysian Adolescents Zahurin Mat Aji, Wan Mohd Yusoff Wan Yaacob & Nur Haryani Zakaria

26th June 2025 | Session B2 (Online) | 08:00 – 13:30

Smart System, IOT & Emerging Technologies/AI, Data & Digital Transformation in Education & Society/AI & Machine Learning for Health, Well-being & Human Behaviour/ Human-Computer Interaction, Accessibility & User Experience

Chair: Assoc. Prof. Dr Yuhanis Yusof & Assoc. Prof. Dr Massudi Mahmuddin
Venue: Ballroom 3B
Link: https://uum.webex.com/meet/chareen

Time	PID	Title
08:00	142	Integrating Haptic Technology for Targeted Motor Rehabilitation: A Human-Computer Interaction Perspective Chow Tec Soon, Manoranjitham Muniandy, Lim Ean Heng, Savita Sugathan & Nor Fatiha Subri
08:20	156	Exploring the Potential and Challenges of Claude AI in Improving Educational Experiences Edi Supriyadi & Samsul Pahmi
08:40	157	A Sentiment Analysis Study on Digital Colonialism in Social Media using DistilBERT Song Yijie, Hapini Awang & Nasrul Effendy Mat Nasir
09:00	165	Assessing Cybersecurity Readiness for Ransomware Prevention Among Malaysian SMEs: A Preliminary Study Zymul Zafar, Hafizan Mat Som, M Fadzil Hassan, Savita K. Sugathan, Amzari Ghazali & Mujeeb Ur Rehman Shaikh
09:20	166	Assessing The Impact of VR Technology Application on Quality of Life Among the Elderly Hafizan Mat Som, & Amzari Ghazali
09:40	207	Data Augmentation with CTGAN: An Approach for Synthetic Data Generation Yuhanis Yusof & Fathima Fajilaa
10:00	178	Using Readability Metrics in Estimating the Readability of RESTful URI Schema Fuad Alshraiedeh, Norliza Katuk, Hossam Almahasneh
10:20	179	Optimization of Deep Learning Models for Human Activity Recognition using MHEALTH Dataset Zulfikar Sembiring, Khairul Najmy Abdul Rani, Amiza Amir, Siti Julia Rosli, Marni Azira Markom & Ruzelita Ngadiran
10:40	183	Phone Usage, Study Habits, and Academic Performance: Predicting GPA with Machine Learning Zurinahni, Bakary, Altagi, Almonzer, MD Serajun, Basheer
11:00	189	Design and Usability Evaluation of A Smart Mentoring Solution for Educators Hapini Awang, Nur Suhaili Mansor, Mohamad Fadli Zolkipli, Shakiroh Khamis, Mohammed Ahmed Taiye, Abdulrazak F. Shahatha Al-Mashhadani & Ibrahim
11:20	200	A Contextual Inquiry into Visitor Decision-Making at Festival Events Ainnecia Yoag, Masitah Ghazali & Farhan Mohamed
11:40	204	Hand Gestures Recognition System for Touchless Device Screen Control Wong Jian Yoong, Shakiroh Khamis, Ahmad Subhi Zolkafly, Zurida Ishak, Hapini Awang, Nur Suhaili Mansor
12:00	213	User Experience Measurement using SUPR-Q Instrument for Over Time Usage Norhanisha Yusof, Nor Laily Hashim and Azham Hussain

12:20	220	Enhancing Diagnostic Accuracy for Breast Cancer Using Classical-Quantum Hybrid and Transfer Learning Technique Basheer Riskhan, Roua Alimam, Bakari Salim Mahaba, Dua-e-Uswa, Malrey Lee
12:40	221	Machine Learning for Early Mental Health Detection in Higher Education Staff using Health Screening Data Massudi Mahmuddin & Asma Mat
13:00	228	Deep learning approach to Sign Language Recognition an Inclusive Solution for Hajj Pilgrims Muhammad Siddik Hasibuan, Yusuf Ramadhan Nasution, Armansyah, Muhammad Ikhsan, Aidil Halim Lubis, Sriani

26th June 2025 — Session C1 — 14:30 – 18:00

AI, Society, Ethics and Digital Economy / Smart System, IOT & Emerging Technologies

Chair: Assoc. Prof. Dr Juhaida Abu Bakar
Venue: Ballroom 3A

Time	PID	Title
14:30	141	Integrating AI, IT Governance, SLA, and Predictive Maintenance to Enhance Operational Efficiency - Case Study on CRM Provider in Indonesia Samudra Prasetio & Gunawan Wibisono
14:50	144	Blockchain-Based Cheat Detection System for Multiplayer Online Games Syamsul Erisandy Arief, Reyhan Fajar Pamenang, Riri Fitri Sari
15:10	158	The Mediating Role of Perceived Ease of Learning in Teacher Readiness to Adopt Blockchain for Educational Assessment Joharri Shuhaimi, Hapini Awang, Mohd Fairuz Jafar, Nur Suhaili Mansor, Shakiroh Khamis & Abdulrazak Faiek Shahatha Al-Mashhadani
15:30	175	Sentiments of Cyber Independence and Indigenous Technologies in Malaysian Higher Education During the Industrial Revolution 5.0 Era Nasrul Effendy Mat Nasir, Hapini Awang, Wan Mohd Yusoff Wan Yaacob, Azlini Awang, Nur Suhaili Mansor, Khuzairi Mohd Zaini & Song Yijie
15:50	205	AI-Driven Influencer and Market Analysis: A Social Network Approach to Measuring E-Commerce Relationships Juhaida Abu Bakar, Chong Kar Min, Mohd Zulhisham Mohd Radzi, Fauziah Baharom, Yuhanis Yusof, Mohamed Ali Saip, Ruziana Mohd Rasli, Muhammad Amirul
16:10	206	Forecasting Sectoral Energy Demand in Malaysia using Artificial Intelligence Techniques: A Comparative Analysis Muhammad Abqari Zulkifli, Suwannit Chareen Chit Sop Chit, Jefri Marzal and Ahmad Hanis Mohd Shabli

26th June 2025 | Session C2 (Online) | 14:30 – 18:00

AI, Society, Ethics and Digital Economy / AI in Cybersecurity, Fraud Detection & Digital Trust

Chair: Dr Zhamri Che Ani
Venue: Ballroom 3B
Link: https://uum.webex.com/meet/chareen

Time	PID	Title
14:30	137	An Improved Offline Text-independent Chinese Writer Identification Scheme Based On Two-tier Image Retrieval Mechanism Gloria Jennis Tan, Ung Ling Ling, Tan Chi Wee, Zeti Darleena Eri, Norlina Mohd Sabri, Hoshang Kolivand and Ghazali Sulong
14:50	149	Cybersecurity Readiness for Ransomware among Small and Medium Enterprises in Malaysia: A Protection Motivation Theory Perspective Nurfakhriah Firdaus Azmi, K.S. Savita, Mohd Fadzil Hassan & M. Manoranjitham
15:10	160	Leveraging Explainable AI (XAI) for Online Fraud Prevention: Global Solutions and Implications for Malaysia's Digital Economy Parteeban M Varatharajoo, Nur Haryani Zakaria, Juhaida Abu Bakar and Aniza Mohamed Din
15:30	162	Cyberbullying Detection in the Libyan Dialect using Convolutional Neural Networks Sara M. Elgoud, Mustafa Ali Abuzaraida, Zainab S. Attarbashi, Mohamed Ali Saip
15:50	167	A Trust-Based Reputation System for Security in the Internet of Vehicles (IoV) Nozha Dhibi, Amel Meddeb Makhlouf & Faouzi Zerai
16:10	174	Smart Fire Detection and Monitoring System using IoT Via Telegram Notification Arnold Kanang Anak Daud, Mohd Helmy bin Abd Wahab, Norhafizah Ismail, Radzi Ambar, Muhammad Mahadi Abdul Jamil, Mohd Fauzi Abu Hassan and Mohamad Farhan Mohamad Mohsin
16:30	177	Alternative Credit Scoring Risk Prediction: A Machine Learning Approach with Finbert-Sentiment Driven on Social Media Data Nurul Syafidah Jamil, Chew Chun Pang, Ooi Joo On, Anusha Annathurai, Selvamalar Nasaratnam & Ana Nabilah Sa'uadi
16:50	192	Optimization Model: Integrating Blockchain Technology with Economic Order Quantity (EOQ) Framework for Multi-Echelon Supply Chains Afif Badawi, Syahril Efendi, Tulus &Herman Mawengkang
17:10	197	A Linear Sequential Model for Cloud-Based ECM: Comparative Analysis with On-Premises ECM Mohd Adan Omar, Ammber Nosheen, Nur Azzah Abu Bakar, Noraziah ChePa, Ijaz Yusuf
17:30	210	Exploring Big Data in Smart Cities Research: A Bibliometric Analysis Zhamri Che Ani, Nur Nazifa Zhamri & Zauridah Abdul Hamid
17:50	212	Measuring The Effectiveness of Personal Data Protection Awareness Program Among University Students Nor Laily Hashim, Annatalie Anand, Kamarul Faizal Hashim and Norhanisha Yusof

26th June 2025 **Session C3 (Online)** 14:30 – 18:00

AI, Society, Ethics and Digital Economy / AI & Machine Learning for Health, Wellbeing & Human Behaviour / AI, Data & Digital Transformation in Education & Society / Human-Computer Interaction, Accessibility & User Experience / Smart System, IoT & Emerging Technologies

Chair: Dr Mohammad Sabri Sinal @ Zainal
Venue: School of Computing
Link: https://uum.webex.com/meet/msabri

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14:50	150	Comparison of Different LSTM Algorithms in LIME Based Explainable AI for Depression Detection System from Social Media Status Siti Nawal Jaya & Riri Fitri Sari
15:10	164	Sentiment Analysis in The Education Sector: A Review Study Aqdas Enad Eisa, Siti Zaiton Mohd Hashim & Aryati Bakri
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15:50	199	Imagining Companion Robots: A Hybrid Artistic Study of Loneliness and Design in Higher Education Zhongjing Jiang, Jean Wainwright, Noradila Nordin & John Zhang
16:10	218	Augmented Reality Storytelling: Re-Living The 1821 Kedah-Siam War at Kota Kuala Kedah Noradila Nordin, Husniza Husni, Fakhrul Anuar Aziz & Azizi Abd Aziz
16:30	227	Implementation of Support Vector Machine Architecture for Anomaly Detection in IoT Networks Muhammad Irfan Sarif, Syahril Efendi, Poltak Sihombing, Herman Mawengkang

ABSTRACT

PID 137

An Improved Offline Text-independent Chinese Writer Identification Scheme Based On Two-tier Image Retrieval Mechanism

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Research in writer identification has received significant interest in recent years due to its forensic applicability. Undoubtedly, many achievements have been carried out on the traditional method which is without retrieval and only focused on inconsistent and lead ambiguous identification performance. A major problem with this kind of traditional method is searching and retrieval of a document from large image repositories is currently a big issue. In this paper, the focus aim is to determine the effectiveness and reliability of integrating retrieval mechanisms compared to the best and up-to-date techniques for writer identification without retrieval mechanism in offline text-independent Chinese writer identification. Experiments were con-ducted on an open HIT-MW database which is widely used for performance evaluation and employed the same standard dataset for benchmarking. The proposed method incorporates a combination of selected features—Statistical Local Ternary Local Binary Pattern (SLT-LBP), Histogram of Contour (HC), and Gray Level Difference Method (GLDM)—integrated with a Euclidean distance-based classification framework. Experimental evaluations conducted on the publicly available HIT-MW dataset demonstrate that the proposed approach achieves an identification accuracy of 96.68%. These results indicate the potential of the proposed method to perform competitively with existing state-of-the-art techniques, while also offering improvements in scalability and interpretability for writer identification tasks. Integration method with two-tier image retrieval for reducing search space in interpretability of results by forensic experts when large databases are involved and improving identification rates, yet remarkable accuracy. This area, however, still has a large room for research which can be taken by upcoming researchers.

Keywords: Chinese Handwriting Analysis; Image Retrieval; Writer Identification; Writer Retrieval

PID 141

Integrating AI, IT Governance, SLA and Predictive Maintenance to Enhance Operational Efficiency - Case Study On CRM Provider in Indonesia

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This paper proposes a framework that integrates Predictive Maintenance (PdM), Customer Relationship Management (CRM), Artificial Intelligent (AI) and Service Level Agreement (SLA) to increase operational efficiency. The framework offers aim to harmonize various strategy and operational elements in CRM Industry

in Indonesia, with a focus on implementing Predictive Maintenance (PdM) as key point. PdM which powered by AI and Deep Learning model like LSTM, offer the power to analyse real-time data, predict equipment failures and optimize maintenance schedules. From this point of view, organization is able to reduce the accident, which is unplanned, reducing the maintenance cost and ensuring compliance with SLA commitments. This paper conducts the research on a CRM provider in Indonesia in order to demonstrate that the framework can be proved for maximizing resources efficiency and enhancing customer satisfaction. The study also provides some key challenges such as data quality, the complexity of technology and organizational challenges remain. This framework offers an alternative solution for organizations, especially in CRM industry, to navigate the complexity of modern business landscape, focusing on operational optimization, risk management and SLA commitments.

Keywords: Customer Relationship Management, Predictive Maintenance, Artificial Intelligence

PID 142

Integrating Haptic Technology for Targeted Motor Rehabilitation: A Human-Computer Interaction Perspective

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Stroke rehabilitation often struggles with effectively addressing motor impairments, especially in providing engaging and targeted exercises. Many existing haptic applications are designed to simulate basic tactile interactions but lack comprehensive integration of motor-sensation feedback, which is crucial for motor recovery. This study explores the potential of haptic technology to enhance stroke rehabilitation by incorporating force feedback into exercises aimed at improving fine motor coordination, wrist flexion, and wrist extension. Interviews with rehabilitation therapists from the National Stroke Association of Malaysia (NASAM) and Yayasan Ipoh, along with observations during therapy sessions, revealed significant gaps in current rehabilitation practices, particularly in the need for more intense exercises that target specific motor skills. Based on these insights, a prototype was developed using the Phantom Omni haptic device, with exercises including drawing and pushing against varying force levels. Around ten stroke patients from NASAM and Yayasan Ipoh, participated in the study, performing each exercise twice to assess performance. Results showed significant improvements, including a 63% reduction in time for the exercise 1 and a 44% reduction for exercise 2. Additionally, task precision, stylus speed, and depth control improved, demonstrating the effectiveness of haptic feedback in motor recovery. In Exercise 3, time reductions for wrist extension and flexion under force conditions improved by 12.8% and 50%, respectively. These findings highlight the potential of haptic technology to address current challenges in stroke rehabilitation. Future research will focus on longitudinal studies and expanding the scope to include patients with varying levels of motor impairments.

Keywords: Haptic, Force Feedback, Motor Skills, Sensory, Stroke Rehabilitation

PID 143

A Data Analytics Approach to Exploring the Relationship Between TikTok Engagement and Revenue in Malaysia: A Case Study on the Beauty and Personal Care Sector

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TikTok has revolutionized digital marketing, particularly in the beauty and personal care sector, yet the connection between engagement metrics (likes, comments, shares) and revenue remains underexplored. This

study addresses this gap by analysing data from 17 Malaysian TikTok influencers across Celebrity, Macro, Meso, and Micro categories, using the Data Science Trajectories (DST) framework and tools like Python for statistical analysis. Findings reveal a complex relationship: higher engagement does not always lead to increased revenue. While live sessions significantly drive sales through real-time interaction, standard videos enhance engagement but have minimal revenue impact. Celebrity influencers generated the highest revenue, whereas Meso influencers achieved the highest engagement rates, indicating different strategic strengths. Benchmarks for engagement rates are provided to help influencers and brands optimize strategies. The research highlights the strategic advantage of live sessions in bridging engagement and sales, offering actionable insights for leveraging TikTok's unique ecosystem. Future work should explore variables like audience demographics and content types to refine these findings further.

Keywords: Social Media, Business Analytics, Engagement Metrics, e-Commerce Revenue, TikTok

PID 144

Blockchain-based Cheat Detection System for Multiplayer Online Games

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The presence of competitive gaming in the video game industry requires a system that could promote fairness in the gameplay aspect. Many players have utilized networking attacks such as Distributed Denial of Service (DDoS) to win a competitive game. This action will enable players to gain an unfair advantage during gameplay. Attempts to cheat using DDoS attacks in competitive gaming created a significant need for a prevention mechanism. To satisfy this, we have designed a cheat detection system by leveraging Godot DotNet capabilities to connect a game client to the Ethereum Blockchain environment via Nethereum Web3 capabilities. Blockchain is used because it can keep records in an untampered state. We tested our system on the classic Pong game by capturing the positional data of all moving gameplay elements and sending them into the blockchain network. The location coordinate of each central gameplay element in the game is stored in the blockchain. The gameplay evaluation shows that 64-bit hex data of gameplay elements' coordinates have been transmitted and stored successfully. The performance evaluation indicates that the game runs at 180 FPS using 6% of the GPU workload and 11% of the CPU workload, resulting in a time difference of under 200 ms for each transaction.

Keywords: Competitive Gaming, Ethereum Blockchain, Pong Game.

PID 149

Cybersecurity Readiness for Ransomware Among Small and Medium Enterprises in Malaysia: A Protection Motivation Theory Perspective

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The increasing digitalization of Malaysia's economy has rendered Small and Medium Enterprises (SMEs) more susceptible to advanced cyber threats, especially ransomware attacks. Despite constrained resources, SMEs handle sensitive data and play a critical role in national growth, underscoring the importance of their cybersecurity readiness. This paper examines the factors influencing ransomware prevention behaviours among individuals of SMEs in Malaysia, employing the Protection Motivation Theory (PMT) as its theoretical framework. PMT offers an extensive structure for analysing how individuals perceive threats and their motivation to adopt protective cybersecurity measures. This paper seeks to assess the connection between threat appraisal, coping appraisal, and individuals' intentions and behaviours toward ransomware readiness as well as presenting decision-making styles as moderating variable.

Keywords: Protection Motivation Theory, Cybersecurity Readiness, Small And Medium Enterprises

PID 150

Comparison of Different LSTM Algorithms in LIME based Explainable AI for Depression Detection System from Social Media Status

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Depression is a significant global mental health issue that has escalated with the increasing use of social media platforms, offering both challenges and opportunities for early detection. This study focuses on utilizing deep learning techniques, specifically Long Short-Term Memory (LSTM), Bidirectional LSTM (Bi-LSTM), Convolution Neural Network LSTM (CNN-LSTM), and Re-current Neural Network LSTM (RNN-LSTM) to detect depression from social media status updates. The research employs the DR dataset and the depression dataset reddit clean, a collection of user-generated posts annotated for depression indicators. The primary objective is to evaluate the effectiveness of LSTM, Bi-LSTM, CNN-LSTM, and RNN-LSTM models in capturing the temporal and contextual dependencies of textual data for accurate depression classification. The methodology involves pre-processing the dataset to clean and tokenize textual data, followed by embedding techniques for feature extraction. Both LSTM, Bi-LSTM, CNN-LSTM, and RNN LSTM models were t rained and evaluated on various performance metrics, including accuracy, precision, recall, and F1-score. Results demonstrate that for the DR dataset, the LSTM model achieved the highest recall (0.908), while the CNN-LSTM and RNN-LSTM models achieved perfect recall (1.0). For the depression dataset reddit clean dataset, the CNN-LSTM model demonstrated the best performance, with an accuracy and F1-score of 0.959. The dataset showcases exceptional performance across diverse social media platforms, underscoring its adaptability. The attention map visualizations offer profound insights into linguistic patterns and critical features linked to depression in social media content. This research makes a significant contribution to the mental health domain by introducing innovative and explainable models for detecting depression through social media data. These proposed methodologies hold the potential to aid mental health practitioners in early diagnosis and intervention, thereby enhancing the quality of life for individuals impacted by depression.

Keywords: Deep Learning, Depression Detection, LSTM, Bi-LSTM, CNN-LSTM, RNN-LSTM, Reddit Dataset, Explainable AI.

PID 151

Enhancing Snort Rules in SQL Injection Detection Using Fast Pattern and PCRE

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With technological advancement, cyber-attacks are becoming more sophisticated, and as a result, the challenges of effectively identifying breaches are increasing. Therefore, cyber protection systems such as intrusion detection systems (IDS) need frequent revisions to respond to the dynamic landscape of cyber threats. This research focuses on studying the enhancement of the existing Snort base rules by incorporating sophisticated features of Fast Patterns and Perl Compatible Regular Expressions (PCRE). The analysis of the accuracy of Snort IDS detection by enhancing the Snort rule using PCRE and fast pattern against the base rule is presented in this paper. For the experimentation setup, SQL injection attack is simulated for its prominent gateways for web application cyberattacks. The virtualized testing environment, com-prising a centralized system with Snort IDS installed, a simulated attacker using Kali Linux and Metasploit, and a vulnerable Microsoft BizTalk Server 2002, representing the victim environment, facilitated a comprehensive evaluation of Snort's performance. The enhanced rule has shown the ability to reduce false positives while accurately identifying actual SQL injection at-tempts, making it a more effective and reliable detection mechanism. This is crucial for maintaining the integrity of the SQL database and protecting the confidentiality of data.

Keywords: Cybersecurity, Emerging Threats, Intrusion Detection System

PID 156

Exploring the Potential and Challenges of Claude AI in Improving Educational Experiences

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The rapid incorporation of AI technologies, such as Claude.AI, in education is crucial for understanding the utilization, advantages, and possible applications. Therefore, this study aimed to (1) examine how students recognize and employ Claude.AI in academic endeavours, (2) assess the benefits and advantages of using the tool from the students' perspective, and (3) investigate the potential applications of Claude.AI in educational contexts. Undergraduate students from a university in Bandung conducted the study in July 2024, using thematic analysis of interviews with three participants to provide comprehensive insights. The result shows that Claude.AI has superior capabilities in the analysis of graphical and tabular data, providing succinct summaries and strong contextual intelligence, beneficial for both scholarly and artistic endeavours. Students showed the advantages of privacy protection, data analysis, and promoting innovation across several domains. Students expressed apprehensions over excessive dependence on AI, its possible impacts on critical thinking, and ethical issues related to data protection. This study showed the capacity of Claude.AI to improve learning through data analysis, interdisciplinary collaboration, and tailored instruction. Although the technology has considerable benefits, there is a need to harmonize its incorporation with conventional learning methods to preserve critical thinking and the development of interpersonal skills.

Keywords: Artificial Intelligence, Claude.AI, Education, Undergraduate Student

PID 157

A Sentiment Analysis Study on Digital Colonialism in Social Media Using Distil BERT

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With the advent of the digital age, digital colonization has become a controversial topic. This study focuses on users' attitudes on social media Reddit towards digital colonization, aiming to explore users' emotional responses to data control and platform dependence. Unlike most studies that discuss the country or policy level, this study approaches from the perspective of users who generate data. Through sentiment analysis of 2,641 comments on related topics on Reddit, the results show 559 (21.17%) positive and 2,082 (78.83%) negative comments. Most users are dissatisfied with data control. To further investigate the sources of negative sentiment, this study analyses representative comments to deeply interpret users' specific concerns regarding digital colonization and data control. These findings provide empirical evidence supporting the necessity-ty to incorporate individual data sovereignty rights into digital governance frameworks, challenging traditional state-centric paradigms of digital sovereignty.

Keywords: Digital Colonization, Social Media, Sentiment Analysis, DistilBERT

PID 158

The Mediating Role of Perceived Ease of Learning in Teacher Readiness to Adopt Blockchain for Educational Assessment

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Traditional educational assessment systems in Malaysia face persistent issues such as data security vulnerabilities, lack of transparency, and centralised control, which collectively undermine trust, reliability, and operational efficiency. While blockchain (BC) technology has emerged as a promising solution offering decentralisation, immutability, and enhanced data security, a critical gap exists in understanding teacher readiness to adopt such innovations within the education sector. Most prior research emphasises the technical feasibility of blockchain or user acceptance in non-educational contexts, often overlooking educators' cognitive and pedagogical challenges when learning and using unfamiliar technologies. This study investigates how key attributes of BC relative advantage (RA), compatibility (COM), and complexity (CPX) influence teacher readiness for adoption, mediated by perceived ease of learning (PEOL). A total of 750 questionnaires were distributed, resulting in 514 valid responses from post-secondary school teachers in the northern region of Malaysia, achieved through a simple and proportionate stratified random sampling technique. Partial Least Squares Structural Equation Modelling (PLS-SEM) reveals that COM and CPX significantly predict teacher readiness, while PEOL is a partial mediator. RA shows no significant direct or indirect effect, challenging assumptions about its centrality in technology adoption models. These findings contribute to the broader goals of Industrial Revolution (IR) 5.0 by highlighting the importance of human-centric, cognitively accessible technological integration strategies in education, particularly for fostering systemic reform in assessment practices.

Keywords: Assessment Management, Blockchain in Education, Teacher Readiness, Perceived Ease of Learning, Education 5.0

PID 160

Leveraging Explainable AI (XAI) for Online Fraud Prevention: Global Solutions and Implications for Malaysia's Digital Economy

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The global digital economy faces a serious threat from online fraud, as increasingly complex schemes jeopardize consumer confidence and financial stability. Strong fraud prevention systems are now essential as Malaysia develops its digital economy through initiative such as MyDIGITAL. The potential of using Explainable Artificial Intelligence (XAI) to improve online fraud prevention tactics is examined in this study, with a focus on how applicable it is in Malaysia's cultural and legal contexts. Financial institutions, regulators, and end users gain a better understanding and level of trust in AI-driven decision-making adopting XAI's transparent framework. In order to prevent fraud, the study analyses the efficacy and scalability of several global solutions, including anomaly detection and behavioural analytics, in Malaysia. Since Malaysia's Personal Data Protection Act (PDPA) and new AI governance frameworks demand algorithmic accountability and responsible data usage, regulatory compliance receives extra attention. This study investigates the use of XAI technologies in fraud detection using a mixed-methods approach, emphasizing their effects on user trust, operational efficiency, and detection accuracy. Expert interviews and surveys aimed at Malaysian financial and technology stakeholders provide qualitative insights that supplement quantitative data from fraud incidence reports and industry case studies. In order to determine the factors that facilitate and hinder the adoption of XAI in Malaysia, the study also investigates how society and culture view AI transparency. According to research, XAI can greatly increase stakeholder trust and the accuracy of fraud detection, creating a safer online environment. But there are obstacles to overcome, like a lack of technical know-how, worries about data privacy, and the requirement for contextualized solutions. This study adds to the conversation about responsible AI by providing researchers, industry leaders, and policymakers with practical suggestions for bringing international innovations align with Malaysia's distinct socioeconomic and regulatory environment.

Keywords: Explainable Artificial Intelligence (XAI), Online Fraud Prevention, Digital Economy, Malaysia, Regulatory Compliance, Global Solutions, Stakeholder Trust

PID 162

Cyberbullying Detection in the Libyan Dialect Using Convolutional Neural Networks

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Recently, the widespread use of social media has increased, leading to increased concerns about cyberbullying. It has become imperative to intensify efforts and methods to detect and manage cyberbullying through social media. Arabic has recently received increasing attention to improve the classification of Arabic texts. Given the multitude of Arabic dialects used on social media platforms by Arabic speakers to express their opinions and communicate with each other, applying this approach to Arabic becomes extremely challenging due to its structural and morphological complexity. Analysing Arabic dialects using Natural Language Processing (NLP) tools can be more challenging than Standard Arabic. In this paper, we present a study of the impact of using stopword removal and derivation techniques on detecting cyberbullying in the Libyan dialect. We compare the efficiency of text classification when using a Libyan dialect word list alongside pre-generated Modern Standard Arabic (MSA) lists. The texts were classified using Convolutional Neural Network (CNN) classifiers, and the experiments showed that when using Libyan dialect words, the accuracy results were 92% and 83%, and when using only Standard Arabic stop words, the accuracy results were 91% and 77%. From these results, we obtained high accuracy when using stop words specific to the Libyan dialect, and they had a positive impact on the results, better than Standard Arabic stop words.

Keywords: Cyberbullying, Natural language processing, Arabic Dialect, Deep Learning, Convolutional Neural Network, Meta-Learning, Removing stop words

PID 163

Assessment of the Efficacy of a Training Program to Improve Teaching and Learning Strategies Related to Distance Learning

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This study included 256 students from Higher education institutions in the Sultanate of Oman as the sample, and its goal was to assess the efficacy of a training program to improve teaching and learning strategies linked to distant learning. To meet the study's aim, the researcher developed a scale—consisting of ten technological skills—to assess the requirement for training in the relevant areas. The scale's reliability and validity were confirmed. The study proved that individuals with an average degree may get the teaching and learning strategies connected with online education. The training regime described in this study was the reason for the variations in pre- and post-measurements between the experimental and control groups, according to the results. One of the study's most significant suggestions is that colleges and university administrators focus on offering university students accredited programs in teaching and learning strategies relevant to remote education.

Keywords: Distance Learning, Technological Skills, Training Program.

PID 164

Sentiment Analysis in the Education Sector: A Review Study

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This systematic review synthesizes current applications and advancements in sentiment analysis within educational contexts, examining how computational techniques are harnessed to interpret emotions, attitudes, and feedback from various stakeholders. Leveraging a dataset of 408 studies from Scopus, this review focuses on methodologies, including machine learning and deep learning approaches, highlighting their unique contributions and challenges. Key findings reveal that while sentiment analysis offers valuable insights into student satisfaction, engagement, and faculty perceptions, limitations persist due to language diversity, nuanced emotional detection, and limited adaptability across diverse cultural contexts. Furthermore, advanced models like deep learning show potential for processing complex feedback in multi-lingual and dialect-rich educational environments. This study provides a forward-looking perspective, proposing enhanced methodologies to address linguistic diversity and contextual sensitivity, ultimately aiming to optimize sentiment analysis for education and improve educational environments. The findings underscore the necessity for adaptable and culturally respon-sive models, guiding future research towards more inclusive and precise sentiment analysis applications in education.

Keywords: Sentiment Analysis, Education, Student Feedback, Educational Sentiment Analysis, Review

PID 165

Assessing Cybersecurity Readiness for Ransomware Prevention Among Malaysian SMEs: A Preliminary Study

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Ransomware, an extortion malware, prevents user access to systems by encryption. Often, a ransom is demanded to restore access. Covid-19 has exacerbated ransomware attacks, through digitalization and reliance on remote work. The sophistication and complexity of ransomware threats is increasing, as Web 3.0 presents new cybersecurity difficulties. Over 8,000 cyberattacks occurred in Malaysia in 2021, underscoring the importance of robust cybersecurity measures. SMEs that experienced cyberattacks are still unprepared, lacking robust cybersecurity and backups. Although a few studies discuss ransomware and its effects on organizations, the majority concentrate on technical issues, such as, ransomware on a hardware or software level with minimal studies examining the organizational aspect. There are few literatures on how Malaysian SMEs should respond to and bounce back from ransomware attacks. Ransomware's organizational consequences on Malaysian SMEs are still mostly unresolved. This preliminary study examines cybersecurity readiness among Malaysian SMEs specifically, to prevent enterprise ransomware attacks. Findings highlight three key themes: (1) Organizational Factors, including resource distribution, risk assessment, software updates, patching, disaster recovery plans and incident response processes; (2) Infrastructure limitations include financial restraints, lack of IT resources, and challenges with intrusion detection, firewalls, and preventative security measures; and (3) Employed Strategies, Policies, and Measures, covering security strategies, tools, disaster recovery plans, the trade-offs of current technologies. Using qualitative methods, the findings provide practical recommendations to enhance ransomware resilience and suggest potential directions for more extensive SME data collection. The study's extension will give Malaysia's SMEs a better grasp of cybersecurity issues and ransomware prevention.

Keywords: Cybersecurity Readiness, Enterprise Ransomware Attacks, Malaysian Organizations, Organizational Factors, Small and Medium Enterprises (SME).

PID 166

Assessing the Impact of VR Technology Application on Quality of Life Among the Elderly

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The aging population faces numerous challenges, such as social isolation, reduced mobility, and cognitive decline, all of which significantly diminish their quality of life (QoL). This study explores the potential of Virtual Reality (VR) technology as an innovative tool to enhance the QoL of elderly individuals in Malaysia. Using a qualitative approach, the research involved VR try out sessions and semi-structured interviews with 10 participants aged 65 to 77 from Rumah Seri Kenangan (Elderly Care Centre) in Seri Iskandar, Perak, Malaysia. Participants were exposed to VR experiences, including sports games and meditation applications, designed to stimulate cognitive and physical functions. The findings revealed notable improvements in participants' mood, mobility, and cognitive focus, with the majority reporting a heightened sense of well-being following the VR sessions. However, several barriers were identified, including usability challenges, limitations in grip strength, and the need for cultural and linguistically localized content. These insights underscore the potential of VR technology as a therapeutic tool in elder care, while emphasizing the importance of user-friendly design, clear usability guidelines, and enhanced accessibility to ensure broader adoption and effectiveness.

Keywords: Virtual Reality, Elderly Care, Quality of Life, Immersive Technology, Malaysia.

PID 167

A Trust-Based Reputation System for Security in the Internet of Vehicles (IoV)

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The Internet of Vehicles (IoV) integrates with different nodes, like for example connected vehicles, roadside units, etc. Due to communication exchange, they are exposed to various attacks on the network, which poses a security risk. Nevertheless, security is a major concern in IoV networks, especially during data transmission. To address this issue, we suggest an innovative approach. reputation management schema in an IoV environment to detect attacks at an early stage based on vehicle and driver behaviour along with network state. Our algorithm combines direct and indirect trust with various metrics like Packet Lost Rate (PLR), vehicle speed distance between neighbours, alert content, and link quality. These metrics are used to compute a reputation score to identify malicious nodes. Based on its reputation, vehicles communicate with only trusted nodes. After assessment, we see that our solution surpassed the others solution and has demonstrated superior effectiveness in detecting abnormal vehicles. Furthermore, the computed delay, equal to 4.7 ms, does not affect the network communications, which is interesting for the introduced safety features.

Keywords: Internet of Vehicles (IoV), Attack, Security, Trust, Reputation

PID 168

WI-LOCATE: Innovative Design and Development of Location Finder for Visually Impaired

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This paper presents the design and development of Wi-Locate, an innovative location finding system created to support visually impaired individuals. The system uses a network of static Wi-Fi beacons powered by ESP8266 microcontrollers to help users navigate indoor spaces more accurately. Each user carries a compact device, built with an ESP8266, DFPlayer Mini, speaker, and power management components. The device scans for nearby beacon signals, identifies specific locations, and plays audio messages to guide the user in real time. Designed to be cost-effective, low-power, and scalable, Wi-Locate helps reduce the barriers that visually impaired people often face in public and private settings. Preliminary testing shows that the device performs reliably, accurately detecting locations and providing clear voice instructions. This project represents an important step toward developing accessible technologies that promote independence and improve daily mobility for blind users.

Keywords: Audio-Based Feedback, Indoor Navigation, ESP8266, Visually Impaired, Wi-Fi Beacon.

PID 169

User-Centered Development of a Trustworthy E-Voting Application for Student Elections

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Developing a secure and reliable remote electronic voting (e-voting) application presents critical challenges, particularly in ensuring system integrity, security, and user trust. This study focuses on designing and evaluating an e-voting system for student leader elections, with the objective of addressing the key factors that influence voter confidence. The development process followed structured phases: analysis, design, development, implementation, and evaluation. Key concerns, such as transparency, voter anonymity, prevention of duplicate voting (singularity), and result integrity, were addressed. A survey was conducted with 1,000 randomly selected students to assess their primary concerns and level of trust in the system. Results indicate that transparency, singularity, integrity, and anonymity are the most crucial requirements for an e-voting system. To enhance trust, efforts were made from the design phase through socialization, including educational campaigns, application demonstrations, and user training. Rigorous testing was conducted by internal developers and external stakeholders, followed by a public trial. Out of 3,527 survey respondents, 68.04% expressed trust in the application, deeming it "feasible" for adoption. However, areas such as transparency and feedback mechanisms require further improvement to fully address user concerns. This study contributes to the e-voting field by underscoring the importance of user involvement and extensive testing in developing a trustworthy system for student elections.

Keywords: e-voting, Student General Election, Trusted System

PID 172

A Phishing Email Detection Model Based On Machine Learning

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The growing volume and sophistication of phishing emails have become a significant threat to data security, often serving as the initial vector for data breaches. Traditional phishing detection methods, such as blacklists and heuristic filters, are increasingly inadequate against evolving phishing email attack strategies. To address these limitations, this study proposes a machine learning-based phishing email detection model as a proactive and adaptive mechanism for enhancing organizational data protection. The study evaluates three supervised machine learning algorithms which are Support Vector Machine (SVM), Random Forest, and Decision Tree, before and after the application of enhancement techniques, including Synthetic Minority Oversampling Technique (SMOTE), Term Frequency-Inverse Document Frequency (TF-IDF), Singular Value Decomposition

(SVD), and cross-validation. By using a dataset comprising 28,747 labelled emails, the models are trained, tested, and evaluated based on accuracy, precision, recall, and F1-score, with further insight gained through confusion matrix analysis and Receiver Operating Characteristic (ROC) curves. Among the models, Random Forest consistently delivers the strongest performance across all metrics, while Decision Tree demonstrates the most notable improvement after enhancement. Although SVM maintains high recall and precision, it is less responsive to the applied pre-processing techniques. Overall, the enhancements contribute to increased true positive rates and reduced false negatives, thereby minimizing the risk of undetected phishing threats. These findings emphasize the importance of iterative model refinement in strengthening phishing detection systems. The study offers a scalable and practical solution for mitigating phishing risks and encourages future study into real-time detection and deployment in operational environments.

Keywords: Cybersecurity, Data protection, Machine learning, Phishing email detection, Supervised learning

PID 173

Intelligent Chatbot for Student Feedback Analysis Using Machine Learning Approach

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In higher education, student feedback is a critical component for continuous improvement. However, traditional web-based surveys often suffer from low engagement and superficial responses. This study introduces the Student Satisfaction Survey Chatbot (SSSC), an intelligent, AI-driven system designed to collect and analyse student feedback through interactive, conversational dialogue. Developed using open-source Natural Language Processing (NLP) libraries and Large Language Models (LLMs), the chatbot can detect sentiment, generate context-aware follow-up questions, and filter inappropriate content. Additional functionalities include language detection to enforce English-only feedback and a profanity filter to ensure respectful interactions. The system's backend is built with Python and MySQL, while the front-end facilitates an intuitive user experience. Results demonstrate that the SSSC offers a more engaging and effective alternative to traditional feedback methods, providing administrators with actionable insights to enhance the student experience.

Keywords: Chatbot Development, Large Language Model, Machine Learning, Natural Language Processing

PID 174

Smart Fire Detection and Monitoring System Using IoT via Telegram Notification

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House safety protection from fire is crucial to ponder. In reality, disasters triggered by a sudden or unpredictable fire are one of the leading causes of significant property and human loss. The lack of warn local emergencies and fire rapid alert has added troublesome during fire mishap occurrence. In this paper, the project's goal is to improve house safety, with the primary goal of preventing fires from affecting residents and property inside the home. A low-cost Wi-Fi module, the ESP32 DEVkit V1, as well as an IR flame detection sensor, a Global Positioning System (GPS) module, and a buzzer, are used to create this proposed system by

using Internet of Things. With the data obtained by the system, the sensors identify and warn local emergencies, as well as alert organizations such as fire departments. It yields the exact location to the user and firefighter's department via a well- connected module. Through this significant system, it can assist users in improving their safety standards by providing a quick response and efficient fire response management in the event of an accident. Finally, the suggested system's major benefit is that it reduces false alarms, making it more dependable. The system leverages the Telegram application, which makes data sharing quicker and more trustworthy. In future research, this system can be improved with secure components and established testing process. It is to ensure its robustness and comprehensive program's configuration for users' safety and satisfaction.

Keywords: Internet of Things (IoT), Fire detection and monitoring system, Arduino Uno, GPS navigation, Telegram Platform.

PID 175

Sentiments of Cyber Independence and Indigenous Technologies in Malaysian Higher Education During the Industrial Revolution 5.0 Era

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Despite the country's digital ambitions, institutions remain largely dependent on foreign technologies, which poses challenges to data sovereignty, cybersecurity, and sustainability in local innovation. This over-dependence hampers Malaysia's capacity to develop a self-reliant and resilient digital ecosystem. As the nation's future talents and leaders, higher education students should view this phenomenon as a threat to the country's independence. Although the issue appears significant, it has yet to truly capture the attention of researchers, particularly in the field of information systems. Therefore, this study investigates higher education students' sentiments regarding indigenous technologies in Malaysia's cyberspace independence. It used purposive sampling in a qualitative approach by surveying 27 students obtained via open-ended questionnaires from different academic institutions and disciplines. Sentiment analysis, thematic analysis, and cluster analysis were used to analyse the data. With an average sentiment score of +0.17, indigenous technology is perceived as moderately positive by virtue of its affordability, contextual relevance, and improved security features. The themes were found to support local needs and economic advantages. K-Means clustering of these vectors revealed three important clusters: practical benefits, economic impact, and customization potential. The research finds indigenous technologies important as strategic tools for minimizing foreign dependency, safeguarding data, and promoting localized innovation. The next step will be to study institutional barriers to adoption, look at the long-term impact of adoptions across demographics, and evaluate the readiness of policy to enable home-grown digital solutions. This is important for making a secure, competitive and sovereign future for Malaysia in the digital age.

Keywords: Indigenous technology, Cyber independence, Sentiment analysis, Thematic analysis, Cluster analysis.

PID 176

From Text to Therapy: A Continuous Sentiment Analysis Framework for Real-Time Mental Health Monitoring in Mobile Applications

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The rapid growth of mobile applications for mental health support has created a demand for real-time sentiment analysis tools. These tools aim to monitor emotional states and provide timely interventions. However, existing systems face important challenges such as poor label quality, limited data avail-ability,

insufficient feature extraction, and a lack of adaptability in Machine Learning (ML) models. This study gives a Continuous Sentiment Analysis Framework for Real-Time Mental Health Monitoring (CSA-MH) to address these gaps. Indeed, the framework leverages the latest natural language pro-cessing techniques such as Bidirectional Encoder Representations from Transformers (BERT) for contextual understanding and EmoLex for emotional feature extraction combined with adaptive machine learning models like Long Short-Term Memory (LSTM) and Gradient Boosting Machines. Also, it employs semi-supervised learning for improved label quality, data augmentation for enhanced dataset diversity, and online learning for continuous model updates. Experimentally, the results demonstrate the frame-work's effectiveness by reaching an accuracy of 92.3%, an F1-score of 0.91, and outperforming baseline models such as BERT, LSTM, and SVM. The test cases clarify the framework's ability to detect emotional shifts, provide timely interventions, and emphasize its potential for real-world mental health applications. Eventually, the CSA-MH framework provides an adaptive and scalable solution for real-time mental health monitoring that covers the way for more effective and personalized mental health care.

Keywords: Sentiment Analysis, Mental Health Monitoring, Adaptive Machine Learning.

PID 177

Alternative Credit Scoring Risk Prediction: A Machine Learning Approach with Finbert-Sentiment Driven on Social Media Data

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Access to formal credit remains limited for individuals in low-income economies due to insufficient traditional credit history. Conventional credit scoring models rely on historical financial data and often fail to capture the real-time dynamics and external factors that influence a borrower's creditworthiness combining conventional credit scoring with sentiment analysis. This paper proposes integrating conventional credit scoring with sentiment analysis to develop a dynamic and comprehensive assessment of credit risk. Specifically, the paper utilizes alternative data from social media and employing FinBERT as a transformer-based language model fine-tuned for financial text which enables accurate polarity classification of finance-related user-generated contents. These sentiment-annotated sentences extracted from FinBERT are then used to train five different machine learning classifiers. The credit scoring formulation adopts an 80:20 weighting scheme where 80% importance to traditional financial data and 20% to sentiment data derived from social media. This weighting is proposed based on the higher reliability and regulatory acceptance of structured financial records in assessing creditworthiness. In contrast, the sentiment data originates from user-generated social media content which can be less consistent and more susceptible to noise. The Random Forest outperformed all other evaluated models and consistently yielded the highest predictive accuracy across experiments. The ensemble structure of this classifier is well-suited for handling sentiment-rich social media data and make it effective when integrating FinBERT-extracted sentiment features.

Keywords: Credit Scoring, Financial Technology, Machine Learning, Natural Language Processing, Sentiment Analysis, Social Media Data

PID 178

Using Readability Metrics in Estimating the Readability of RESTful URI Schema

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Uniform Resource Identifiers (URIs) may have a direct impact on the under-standing of REpresentational State Transfer State Transfer (RESTful) functionality, and thus, on the discovery of final RESTful product. RESTful Web Services (WS)/Application Programming Interfaces (APIs) are designed to expose data and functionality through resources accessed by dedicated URIs over HyperText Transfer Protocol (HTTP), which recently represents the direct descriptions schema of what functions does the concerned RESTful WS/API present. Furthermore, the discovery of suitable RESTful is heavily rely on the simplicity of understanding their URI schemas, which recently suffer from critical issues in how to measure their readability. Consequently, this research proposes three readability metrics for the stated purpose namely: Flesch-Kincaid (F-K), Flesch Reading Ease (FRES), Simple Measure of Gobbledygook (SMOG), and Cole-man Liau Index (CLI). The research identifies the variables required to calculate the readability metric and formulate the equations for them. Four experts in linguistics were asked to validate the proposed metrics and their identified variables. The research successfully conducted empirical research on 8 well-known REST-ful WSs/APIs of the dataset, and the proposed metrics were implemented on 6952 URIs schemas. The average values for the aforementioned metrics were 7.41%, 59.63%, 6.73%, and 17.55% respectively.

Keywords: URI Schema, URI Readability, Readability Methods

PID 179

Optimization of Deep Learning Models for Human Activity Recognition using MHEALTH Dataset

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Human Activity Recognition (HAR) is a fast-developing topic with applications in healthcare, sports analytics, and human-computer interaction. Deep Learning (DL) models have shown outstanding performance in HAR tasks; nevertheless, the optimization strategies used have a substantial impact on their effectiveness. This paper presents a hybrid deep learning approach that uses Graph Convolutional Networks (GCN) for spatial feature extraction and Transformer models for temporal sequence modelling to improve HAR performance on the MHEALTH dataset. Four optimization methods are compared, including Stochastic Gradient Descent (SGD), Adam, Adagrad, and Neural Optimizer Search (NOS), to deter-mine their impact on training loss, classification accuracy, and speed convergence. The experimental findings show that NOS has the highest classification accuracy (94.3%), beating other optimizers with faster convergence. While Adam has high initial learning capabilities, it is prone to overfitting, whereas SGD takes extensive training to work optimally. AdaG-rad, on the other hand, struggles to adapt to extremely varied sensor input. These findings emphasize the importance of adaptive optimization in deep learning-based HAR, providing useful insights into determining appropriate training procedures for real-world deployment.

Keywords: Deep Learning, MHEALTH Dataset, Adaptive Optimization, Training Loss, Accuracy, Speed Convergence

PID 180

Games as Educational Media to Enhance Children's Knowledge in Waste Sorting: A Development Process

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This study aims to develop an educational game about waste sorting. This study comprises four distinct stages. The initial stage involves data collection. The subsequent stage involves data analysis. The third stage is game development, and the last stage is evaluation. This study conducted an analysis of the types of waste generated and subsequently organized the game into two distinct game modes. The first game mode is a side-scrolling game, while the second game mode focuses on time management. We conducted pre-test and post-tests tests

to test how effective the game media is in providing waste sorting education to elementary school children. Based on the test results, it can be concluded that this educational game can increase children's knowledge about the types of waste. Future research will analyse children's behaviour after playing the game. It is hoped that children will not only be able to sort waste but also implement the concept of sorting in everyday life.

Keywords: Game, Game Development, Game Education, Waste, Waste shorting

PID 181

Early Heart Disease Detection Based on Anomaly Behavior in ECG Data Using Cross-Correlation and Machine Learning

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Detecting anomalies in electrocardiogram (ECG) signals is vital for early heart disease detection and improving patient outcomes. Achieving high accuracy in traditional methods often requires complex feature selection, leading to increased model complexity without significant performance improvements. To address these challenges, this study proposes a hybrid model that combines the Support Vector Machine algorithm with cross-correlation for feature extraction and classification of electrocardiogram signals into Normal Sinus Rhythm and Atrial Fibrillation. The model was trained and validated using a curated dataset of 36 electrocardiograms recordings, which were segmented and pre-processed to improve feature clarity and accuracy. By using cross-correlation to extract features from electrocardiograms patterns and Support Vector Machine for classification, the model demonstrates strong classification performance in distinguishing between NS and AF signals, achieving 100% accuracy, sensitivity, and specificity on a curated dataset. These results demonstrate the reliability of the proposed method in detecting heart rhythm anomalies with precision. This research advances electrocardiogram analysis by introducing a diagnostic approach that combines interpretable cross-correlation-based feature extraction with the efficiency and robustness of Support Vector Machine classification. By performing accurately on a well-annotated dataset with minimal pre-processing and limited data, the proposed model demonstrates potential for scalable and objective implementation in real-world clinical settings for early heart disease detection.

Keywords: Anomaly Heart Disease Detection, Cross-Correlation, ECG Signals

PID 183

Phone Usage, Study Habits and Academic Performance: Predicting GPA with Machine Learning

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This study investigates the impact of mobile phone use and study habits on students' academic performance, as indicated by their overall Grade Point Average (GPA). Data collected from Al-Bukhary International University were utilized to investigate the impact of daily phone use, study time, and levels of distraction. Four machine learning algorithms — Linear Regression, Random Forests, Support Vector Regression (SVR), and Gradient Boosting — were employed to deter-mine the extent of association of these variables with GPA. It is evident that increased smartphone use during study periods is linked to poorer GPA performance, whereas constant and focused study habits are strongly correlated with improved academic performance. Throughout the models that were tested, Random Forests performed best in prediction (98.05%), followed by Gradient Boosting (97.78%), Linear Regression (96.88%), and SVR (94.00%). These results affirm the necessity balance between digital device use and productive learning behaviours. Practically, the results suggest institutional and individual interventions towards maximizing digital device well-being, such as establishing intentional limits on screen time, establishing distraction-free learning environments, and integrating digital self-

regulation into student support programs. These interventions hold the potential to serve as a foundation to increase students' academic success and psychological resilience.

Keywords: Smartphones, Students' Performance, Academic Achievement, Grade Point Average, Study Methods, Mobile Interferences, Machine Learning.

PID 187

Systematic Literature Review on Artificial Intelligence Integration in Educational Platforms

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The integration of Artificial Intelligence (AI) in Educational Platforms (EP) has transformed the modern education landscape, enabling personalized learning, efficient administrative processes, and data-driven decision-making. This systematic literature review aims to explore the trends in AI technologies and their integration with educational platforms, the challenges and limitations encountered, and future research directions that can address the gaps in AI implementation in education. A comprehensive search was conducted on leading academic databases, following the PRISMA framework, to analyse articles published between 2015 and 2024. The findings revealed that AI technologies, such as Machine Learning (ML), Natural Language Processing (NLP), and Generative AI, are most widely adopted in educational platforms. However, ethical issues, technological infrastructure gaps, and teacher and student readiness pose significant barriers to wider adoption. This study highlights the importance of addressing these challenges to ensure equitable and effective implementation of AI in education. Insights from this review contribute to the understanding of how AI can improve educational outcomes and provide a roadmap for future research.

Keywords: Generative AI, Ethical Issues, Teacher and Student Readiness

PID 188

Monitoring Land Surface Temperature Variations Using Google Earth Engine: A Case Study of Urban Expansion in Perak (2019–2023)

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This study investigates Land Surface Temperature (LST) trends in Perak, Malaysia, from 2019 to 2023, amid increasing urban expansion, vegetation degradation, and thermal stress linked to anthropogenic land use change. Using satellite remote sensing and cloud-based geospatial analysis, the study provides a systematic assessment of LST variations over time to inform climate adaptation strategies. Landsat 8 and MODIS datasets were processed via Google Earth Engine (GEE), applying the Normalized Difference Vegetation Index (NDVI), Vegetation Cover Proportion (Pv), and Emissivity (Em) to estimate LST with spatial and temporal consistency. Key outputs include annual true-colour composites, NDVI distributions, and LST maps, complemented by time-series analysis to reveal multi-year patterns. Findings indicate a consistent increase in LST across the study period, particularly concentrated in densely urbanized and deforested areas, with limited signs of vegetation recovery. These thermal anomalies are aligned with known urban heat island effects and reflect a broader trajectory of environmental degradation. The analysis highlights a critical feedback loop between land cover change and surface warming, underscoring the influence of human activity on local climate systems. While some localized reforestation is evident, the overall vegetation health has declined, contributing to increased surface heat absorption and reduced climate resilience. This study contributes to climate change research by demonstrating the utility of multi-source satellite data and cloud computing for fine-scale LST monitoring. It also emphasizes the need for targeted interventions such as urban greening, reforestation, and sustainable

land-use policies to mitigate the adverse impacts of temperature escalation. The methodology and findings can support data-driven decision-making and serve as a reference for replicating LST studies in other climate-vulnerable regions.

Keywords: Land Surface Temperature, Urban Expansion, Google Earth Engine, NDVI, Remote Sensing, Climate Change.

PID 189

Design and Usability Evaluation of A Smart Mentoring Solution for Educators

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Mentoring plays a crucial role in shaping the professional development of educators, yet many existing mentoring programs rely on manual processes that are inefficient and resource-intensive. This study aims to understand the requirements and acceptance of a Smart Mentoring Management System (SMM), a structured, web-based platform to support mentors, mentees, and education authorities in managing mentoring activities, tracking progress, and improving engagement. Developed using a prototyping approach, the system was refined based on user feedback, and its usability was evaluated by 15 respondents to assess its effectiveness. The findings indicate high user acceptance, highlighting the system's potential to enhance the efficiency of mentoring program management. While this study primarily focuses on digitizing and streamlining mentoring processes, it also lays a fundamental groundwork for future advancements, particularly in integrating AI-driven mentoring features such as predictive analytics, adaptive learning paths, and AI-powered feedback mechanisms. This research contributes to the ongoing transformation of education management systems and provides a foundation for further exploration into AI-enhanced mentoring in line with Industry Revolution 5.0 (IR 5.0).

Keywords: Education Management, Educational Technology, ICT in Education, Mentoring, Web Applications.

PID 190

Gaming for A Greener Future: The Power of Games in Inspiring Eco-Awareness in Malaysian and Indonesian Schools

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Low recycling awareness in Malaysia and Indonesia remains a concern de-spite various initiatives. This study explores game-based learning as an innovative approach to address this issue through G-Ventures, an eco-awareness game designed for Malaysian and Indonesian schoolchildren. The primary objective is to evaluate its effectiveness in fostering recycling awareness and encouraging responsible waste management practices. A series of game-based experiments were conducted with 30 primary school students in Malaysia and 29 elementary school students in Indonesia. The methodology included pre and post-test assessments during eco-awareness sessions to measure changes in students' recycling knowledge, attitudes, and behaviours. The findings indicate that game-based intervention significantly enhances students' understanding of recycling practices, demonstrating its potential as an engaging and effective educational tool. Beyond its immediate impact, this study highlights a broader significance of integrating gamified learning approaches into environmental education. By making learning interactive and enjoyable, eco-awareness games can motivate

children to adopt sustainable behaviours from an early age. The implications extend to future educational programs, where game-based strategies can be utilized to cultivate eco-awareness in young learners. This study aligns with the United Nations' SDG 12 (Responsible Consumption and Production), which promotes waste reduction, reuse, and recycling. By fostering responsible waste disposal habits among schoolchildren, game-based intervention contributes to resource conservation, energy savings, and pollution reduction. Ultimately, this study underscores the role of interactive learning in shaping a greener future, where younger generations actively participate in environmental sustainability efforts.

Keywords: Game-Based Intervention, Eco-Awareness, Recycle Awareness, Waste Management.

PID 192

Optimization Model: Integrating Blockchain Technology with Economic Order Quantity (EOQ) Framework for Multi-Echelon Supply Chains

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The optimization of supply chain management (SCM) has become increasingly critical due to the rising complexity of global operations and the growing emphasis on sustainability. Traditional supply chain systems often suffer from inefficiencies, including manual processes, poor visibility, and high operational costs. These challenges are further amplified by the need to comply with carbon emission regulations and meet consumer demands for environmentally responsible practices. Blockchain technology offers a transformative solution by providing a decentralized, transparent, and secure ledger for tracking supply chain transactions in real time. This study integrates blockchain technology with the Economic Order Quantity (EOQ) model to optimize operational costs and carbon emissions in multi-echelon supply chains. The proposed framework incorporates smart contracts for automation and real-time decision-making, enabling transparency and efficiency across the supply chain. By addressing the complexities of multi-tiered supply chains, the study demonstrates the significant benefits of blockchain-enabled EOQ models in reducing costs, enhancing collaboration, and achieving sustainability targets. Simulation scenarios, including Random Batch and EOQ-based processes, are evaluated, showing that the blockchain-enabled EOQ approach delivers superior results in terms of cost stability and emission reductions. This research provides a robust framework for modern supply chains to balance economic performance with environmental responsibility.

Keywords: Supply Chain, Blockchain Technology, Economic Order Quantity (EOQ), Carbon Emissions, Operational Efficiency

PID 195

Predictive Modeling of Software Team Performance Based on Gender and Task Complexity Using Logistic Regression and Decision Tree

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This paper investigates the effect of gender and task complexity on software development performance, addressing a critical gap in empirical research and predictive modelling that warrants further investigation. Understanding how these factors interact is crucial for optimising task allocation and enhancing team efficiency in software engineering environments. To investigate this, data were collected from two universities involving 180 software development students with an equal representation of male and female participants. Participants were required to complete programming tasks at three levels of complexity—easy, medium, and hard—to assess their performance under varying cognitive loads. The results indicate a performance disparity based on task complexity, where male software developers consistently outperformed their female counterparts as the complexity of the tasks increased. Further analysis using predictive modelling techniques,

which are logistic regression and decision tree models, revealed that logistic regression consistently achieved higher accuracy and F1 and AUC-ROC scores, demonstrating its superior predictive capability in modelling performance variations. Despite these findings, further research is necessary to explore additional interventions to help optimise task allocation based on individual strengths and expertise. Additionally, future studies should continue to challenge stereotypes and explore innovative strategies for promoting diversity and equality in software development.

Keywords: Gender, Software Team, Task Complexity, Team Performance

PID 196

Designing Tangible User Interfaces for Neurodiversity: A Focus on Dyslexia-Friendly Features

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Tangible User Interfaces (TUI) provide multisensory interaction and engagement, which is a necessity when it comes to learning for neurodiversity, such as children with dyslexia, dyscalculia, and autism spectrum disorder. Diversified by their learning needs, neurodiversity learners require specifically designed tools to assist them in learning. Existing TUIs present scarce evidence of specific design features targeted at reading for neurodivergent children, with consideration of Universal Design principles. Therefore, this paper presents the TUI design features that are specifically tailored to cater to reading difficulties hence referred to as dyslexia-friendly. The features were obtained through focus group discussions with four special education teachers. The findings revealed six design features that are suitable for TUIs targeting providing multisensory learning sessions for reading problems that are mapped to the five dimensions of interaction design. The design features are crucial to trigger multiple senses while a child is learning to read, especially when they struggle to process text, hence providing a more inclusive and effective learning session. This effort strives toward catering to UNESCO Sustainable Development Goal 4, which aims to promote inclusive and equitable quality education.

Keywords: Tangible User Interfaces, Interaction Design, Universal Design, Neurodiversity, Dyslexia

PID 197

A Linear Sequential Model for Cloud-Based ECM: Comparative Analysis with On-Premises ECM

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The rapid growth of digital information has made effective enterprise content management (ECM) essential for modern organizations. While traditional on-premises ECM systems have long supported information management needs, the shift toward cloud-based ECM offers enhanced scalability, accessibility, and cost-efficiency. Decision-makers now have the option to use cloud computing and migrate ECM systems to the cloud. Having a cloud solution can provide a significant competitive edge. For instance, it can guarantee quicker ECM deployment and lower fixed IT department costs. This paper focuses on the evolution from on-premises to cloud-based systems and proposes a linear sequential model of cloud-based ECM. It presents a conceptual framework addressing key concerns, including stages of the linear sequential model that arise in cloud-based ECM adoption. A structured literature review was conducted using major databases to support the development of the proposed model. Furthermore, the paper highlights the comparative advantages of cloud-based ECM over traditional systems, including enhanced business efficiency, real-time collaboration, and improved resource utilization. By analysing these aspects, the paper underscores how cloud-based ECM

systems transform information management, providing organizations with the tools to drive innovation and maintain a competitive edge. It is crucial to comprehend all options and activities throughout the installation of ECM in the cloud to reap the most excellent possible benefits. This study proposes and describes a broad model for cloud-based ECM implementation.

Keywords: Cloud Computing, ECM, Cloud-Based ECM, Linear Sequential Model, Comparative Analysis

PID 199

Imagining Companion Robots: A Hybrid Artistic Study of Loneliness and Design in Higher Education

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Young adults, a demographic increasingly vulnerable to social isolation—a phenomenon exacerbated by the COVID-19 pandemic—are experiencing profound shifts in interpersonal interactions. However, the rise of digital communication has redefined perceptions of closeness and isolation, fostering a paradoxical state in which individuals feel fleeting connectivity amidst persistent loneliness. To address this social issue, this study introduces a hybrid artistic practice within a university classroom setting, exploring the potential of robotic companionship in providing solace for lonely adults while contributing to future conceptions of companionship in the digital era. This research examines how students and educators at an art university, with varying levels of loneliness, conceptualise and design their ideal companion robots through a structured workshop incorporating AI-generated imagery via text prompts and traditional hand-drawn sketches. The study seeks to identify patterns in the aesthetic, functional, and emotional attributes of imagined companion robots, investigating whether higher loneliness levels correlate with a preference for more human-like, expressive, and interactive features. Findings reveal a strong correlation between loneliness levels and design choices. Participants with higher loneliness scores tend to favour anthropomorphic, emotionally expressive robots, often integrating intricate artistic styles such as Art Deco and Japanese manga. By bridging speculative imagination with technological creativity, this research contributes to ongoing discussions on human-robot companionship, offering insights into its potential role in addressing social isolation and redefining future human-artificial interactions.

Keywords: Humanoid Companion Robots, Hybrid Artistic Practice, Young Adult Loneliness.

PID 200

A Contextual Inquiry into Visitor Decision-Making at Festival Events

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Visitors at festival events employ various strategies to make decisions about activities, food stalls, and navigation through event schedules. The availability of contextual information, such as event layouts, signage, and real-time updates, plays a crucial role in shaping these decisions. This study investigates visitor interactions with event environments through contextual inquiries conducted at three different festivals. It identifies the types of contextual information visitors utilize, the methods they employ to access this information, and the environmental factors that influence their decision-making processes. Additionally, the study explores visitors' preferences for how contextual information should be delivered and proposes best practices for deploying decision-support tools. The findings offer practical guidelines for presenting contextual information effectively within festival environments and inform the design of technologies that support real-time navigation and engagement. These insights can help organizers enhance visitor experiences by providing timely, accessible, and relevant information throughout dynamic and crowded festival settings.

Keywords: Visitor Decision-making, Contextual Inquiry, Festival Events

PID 202

AI vs Human Judgment: A Comparative Analysis of Mybuddy Application and Manual Assessment in Predicting At-Risk Students

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Student disengagement is a critical issue that can lead to school dropout, negatively impacting students' future opportunities and overall well-being. Traditional identification methods rely on school counsellors' assessments, which while valuable, may be influenced by bias and subjectivity. To address this limitation, MyBuddy was developed as a systemized translation of an intelligent predictive model based on 14 key predictors, offering a data-driven approach to detect at-risk students. This study aims to compare MyBuddy's smart predictions with manual assessments conducted by school counsellors in two secondary schools in Kubang Pasu, involving 50 students aged 13 to 17. The findings indicate significant differences between the two approaches. Counsellors classified 60% of students as low-risk, while MyBuddy identified only 32% in this category. MyBuddy detected a higher percentage of students in the high-risk category (34%) compared to manual assessments (14%), demonstrating its ability to identify more students in need of intervention. This suggests that human judgment may underestimate disengagement risks due to bias, whereas MyBuddy provides a more objective and accurate evaluation. By improving early detection and intervention strategies, MyBuddy enhances efforts to prevent student dropout and promote academic success. This research underscores the potential of predictive analytics in educational settings, ensuring timely and effective support for at-risk students. Moreover, it contributes to the United Nations' Sustainable Development Goal 4 (Quality Education) by fostering inclusive and equitable education through innovative technological solutions, ultimately supporting student retention and long-term success.

Keywords: School Disengagement, Smart Prediction, At Risk Students, Intelligent Prediction

PID 204

Hand Gestures Recognition System for Touchless Device Screen Control

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The COVID-19 pandemic has highlighted the critical need for innovative technologies that prioritize public health, particularly in shared spaces. Touchless screen control systems, driven by hand gesture recognition, offer a promising solution by enabling users to interact with digital devices without physical contact, thereby reducing the risk of viral transmission. This research explores the development and application of a touchless system utilizing hand gesture recognition through libraries such as OpenCV, Mediapipe, NumPy, and PyAutoGUI within a Jupyter notebook environment. The system detects and responds to hand gestures in real time via a camera, eliminating the need for physical touch. The findings of the study show that the system is highly accessible, with all respondents successfully downloading it. Most users found the initial hand gesture dictionary to be effective in helping them understand how the system operates. Functionality usage revealed that scrolling up, scrolling down, and mouse cursor control were considered the most useful features, while the option to revisit the hand gesture dictionary was less necessary once users became familiar with the system. The system effectively prevents physical contact, which was unanimously appreciated. Overall, 61.9% of users rated the system with a score of 4 out of 5, indicating a high level of satisfaction. In addition to enhancing public health by minimizing direct contact, these systems offer benefits such as reduced space requirements compared to traditional setups. This paper discusses the potential of hand gesture-based systems to transform human-computer interaction, making it more seamless, inclusive, and accessible. By presenting the benefits and challenges of such systems, this research aims to contribute to the advancement of touchless interfaces, paving the way for a safer, cleaner, and more interconnected world.

Keywords: Hand Gestures, Touchless Screen, Human Computer Interactions

PID 205

AI-Driven Influencer and Market Analysis: A Social Network Approach to Measuring E-Commerce Relationships

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Social Network Analysis is a method used to examine patterns of business relationships and interactions. However, identifying influential individuals and high-value products remains a challenge due to the complexity of customer and seller interactions. This study aims to evaluate seller performance and product lifetime value using AI-driven network analysis involving centrality measures. It applies weighted degree and betweenness centrality to assess their effectiveness in identifying influential entities, including sellers, products, or organizations within a commercial network. Weighted degree centrality measures the strength and frequency of direct connections, while between centrality identifies entities that act as intermediaries across different network segments. The analysis shows that weighted degree centrality aligns more closely with actual sales performance and stakeholder evaluations, making it more appropriate for supporting business decisions in this context. The findings suggest that AI-driven analysis can help businesses consistently identify high-performing sellers and products based on their structural positions within the network. This contributes to the development of more targeted marketing strategies, systematic recognition of top performers, and enhanced customer engagement through data-informed decision-making. Future research may explore the integration of dynamic network modelling with multi-layer e-commerce networks to capture complex commercial dynamics and improve the depth of analysis across various platforms and industries.

Keywords: Social Network Analysis, AI-Driven Market Analysis, Influencer Identification, Weighted Degree Centrality, Business Decision-Making

PID 206

Forecasting Sectoral Energy Demand in Malaysia Using Artificial Intelligence Techniques: A Comparative Analysis

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Forecasting energy demand remains crucial in the energy sector landscape to ensure reliable energy supply, resource allocation, and formulate future sustainable energy policy development. This study employs comparative analysis of forecasting methods to examine the efficacy of AI techniques for energy demand in Malaysia with the aim to provide insights for informed energy policy and planning. Using the datasets from the Malaysian Energy Commission spanning from 1978 to 2021, this study employs forecasting approaches such as prediction models, time-series models, and deep-learning models to predict energy consumption in key sectors across Malaysia. The results revealed that ANN showcased superior performance in capturing complex, non-linear patterns in energy demand data. Contrarily, SGD demonstrates significant stability in its prediction, thus offering reliable alternative to long-term forecasting. The findings provide insights to the growing body of AI-driven forecasting techniques while offering an enhanced understanding for policymakers in steering Malaysia's energy transition.

Keywords: Sectoral Energy Consumption, Energy Demand, Forecasting

PID 207

Data Augmentation with CTGAN: An Approach for Synthetic Data Generation

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Accessing extensive and varied datasets is essential for developing strong predictive models in data analytics. However, many real-world applications suffer from small and imbalanced datasets, leading to overfitting, poor generalization, and low model performance. Traditional data augmentation techniques are often unsuitable for tabular data, as they fail to preserve complex feature relationships. To address this challenge, this study adapts Conditional Tabular Generative Adversarial Network (CTGAN) as a solution for synthetic data generation. The proposed approach involves five phases: (1) Data Acquisition, 2) Data Pre-processing, (3) Model Training, (4) Synthetic Data Generation, and (5) Evaluation. Experimental results on three benchmark datasets show that the proposed work produced data that closely adheres to the statistical distribution of the original dataset, with Wasserstein Distance < 0.05 for numerical features and Jensen-Shannon Divergence < 0.08 for categorical features. Additionally, models trained on datasets including synthetic and real data achieved up to 15% improvement in classification accuracy compared to those trained on real and small datasets alone. Training on a combination of real and synthetic data for the minority class in large datasets significantly improves the F1-score, with gains of approximately 9–10%. This approach also yields a modest increase in overall accuracy (around 1.5%), suggesting enhanced model generalization. These results indicate that the adapted CTGAN is a viable option for data augmentation, addressing problems with limited and imbalanced data for machine learning data training.

Keywords: Deep learning, CTGAN, Data augmentation, Synthetic Data

PID 208

Mapping The Evolution of Real-Time Data Visualization: A Bibliometric Analysis of Scopus Publications

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Real time data visualization has become an essential tool for decision making systems in various industries, including finance, healthcare, IoT, and manufacturing. It enables organizations to monitor and analyse data as it is generated, providing real time insights into critical business operations. However, real time data visualization poses several challenges, including performance, data quality, and visualization complexity. Therefore, the main objective for this paper is to know the trend of real time data visualization within 5 years starting from 2020 to 2025 and highlight components such as methodology, key terms related to the topics and the challenges related to the real time data visualization. A systematic search is done using keyword string title ("REAL" AND "TIME" AND "DATA" AND "VISUALIZATION) which was applied in the Scopus database extracted on 1st March 2025 which resulted to 7707 documents varies from research article to conference paper. VOSviewer is used to analyse the publication and based on the analysis the result shows that real time data visualization is not only focuses on technology usage but also human interaction and emerging visualization techniques between the year 2020 to 2025. Based on the analysis, it is concluded that real time visualization is evolving where the integration of Internet of Things (IOT), Augmented Reality (AR) and Virtual Reality (VR) influences how data is gathered, used and displayed. This paper can serve as a guide and reference for researchers, policymakers, and industry practitioners interested in understanding the development and impact of real time data visualization technologies.

Keywords: Real time data, Visualization, Bibliometric analysis, Scopus database, Visualization technology and Real time data visualization trends.

PID 209

Effectiveness of Games as Tools for Dyslexia Intervention: Evaluation of DysPReX and MazeDyslexic

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Teaching students with dyslexia is very challenging as they naturally have difficulties in phonetic decoding. Past studies revealed that in the phonic-based intervention methods, students only made slow reading progress or no progress at all. Two games, DysPReX and MazeDyslexic were developed as alternative intervention tools with little emphasis on phonics. The aim is to help dyslexics learn spelling and reading in a more fun and exciting way at their own pace. The games were developed using Unity and run on Android mobile devices which gives flexibility to the dyslexics to play anywhere and anytime. The development took 4 months to complete and followed the standard development methodology which include planning, requirement gathering, design, prototyping and evaluation phases. Both games have several advantages over the existing dyslexic games: (1) they use Bahasa Melayu as a medium while the majority of the existing off-the-shelf dyslexic games use English. To date, the number of dyslexic games in Bahasa Melayu is very limited; (2) they were developed according to the guidelines for the dyslexic games, thus they incorporate the specific learning needs of the dyslexics. The evaluation of these games involved 41 respondents and the results show positive feedback from the majority on the user interface, functionality, learnability, and satisfaction aspects. Both games could contribute to the achievement of the United Nations sustainable development goals for quality education, reducing inequalities and sustainable communities. Quality education for dyslexics can be achieved if they can overcome the hurdles in reading, which will allow the other goals to be achieved.

Keywords: Dyslexia Intervention, Reading Difficulties, Phonological Deficits, Game-based Dyslexia Intervention Tools

PID 210

Exploring Big Data in Smart Cities Research: A Bibliometric Analysis

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Big Data has become a critical enabler in the development of Smart Cities, transforming urban planning, infrastructure management, and public services through data-driven decision-making and real-time analytics. With the rise of advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Cloud Computing, cities are increasingly utilizing Big Data analytics to enhance efficiency, sustainability, and quality of life. Key applications include smart transportation, energy management, environmental monitoring, public safety, and digital governance. Given the growing importance of Big Data in Smart Cities, numerous studies have been conducted to explore its impact, challenges, and future directions. Therefore, this study aims to analyse the current research landscape on Big Data in Smart Cities through bibliometric analysis. This study employs a bibliometric analysis based on data obtained from the Scopus database. Using a keyword-based search strategy, 501 documents were retrieved for further analysis. Several Python libraries were used, including pandas, matplotlib, plotly, fuzzywuzzy and wordcloud. The study reports findings using standard bibliometric indicators, including publication trends, document types, source types, subject areas, keyword analysis, geographical distribution, authorship patterns, active institutions, and citation impact. The results indicate a significant growth in research publications on Big Data in Smart Cities since 2015. The dominant subject areas include Computer Science, Engineering, and Social Sciences, reflecting the multidisciplinary nature of this field. Countries such as China, India, and the United States lead in research contributions, while institutions like Kyungpook National University and Shanghai University are among the most active research entities. The increasing number of publications highlights the growing recognition of Big Data as a fundamental pillar of Smart City development.

Keywords: Big Data, Smart Cities, Bibliometric Analysis

PID 211

Enhancing Asnaf Care Through An Augmented Reality Mobile Application

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People today use mobile devices in almost every part of their daily lives, especially for work and business. Mobile devices have become the most common way for people to interact with services and apps. This includes using the Augmented Reality (AR) mobile application to help people learn about donation and encourage them to donate. This study identified the Kedah Zakat Board (LZNK) as an organization that would benefit from an AR mobile application to enhance the promotion of its donation activities, specifically through its Asnaf Care initiative. Currently, Asnaf Care relies on public donations collected via an online system. However, due to ineffective promotional strategies, the funds received are insufficient to meet the needs of the asnaf community. To address this issue, this study proposes the development of an AR mobile application to improve the visibility of fund collection platform for Asnaf Care and increase public contributions. The prototype of the AR mobile application was designed using Design Science Research Methodology (DSRM). The application underwent evaluation through expert review, leading to refinements in its design, content, and functionality according to feedback. The ultimate purpose of this research is to effectively boost the visibility Asnaf Care services and enhance fundraising donations.

Keywords: Mobile-Human Computer Interaction (M-HCI), Interaction Design, Augmented Reality, User-Centered Design Approach (UCD), Asnaf Care, Expert Review, Zakat Kedah

PID 212

Measuring The Effectiveness of Personal Data Protection Awareness Program Among University Students

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The growing dependence on digital platforms has heightened university students' exposure to risks such as personal data breaches, identity theft, and unauthorised access. Despite these threats, many students exhibit limited awareness and understanding of personal data protection, leaving them vulnerable to cyberattacks. Aligned with Malaysia's Personal Data Protection Act 2010 (PDPA), this study evaluates the effectiveness of an educational intervention in enhancing students' knowledge of protecting personal data. The study administered pre-test and post-test questionnaires to measure changes in awareness levels after participants engaged with instructional materials, which included a video and an infographic poster. The results revealed a significant improvement in participant awareness post-intervention, with notably higher gains among IT students than non-IT students. These findings highlight the value of educational interventions in fostering better personal data protection practices. Recommendations for future improvements include expanding participants' diversity, integrating interactive methods, and refining content delivery to better cater to non-IT students. This study contributes to data protection awareness and offers valuable insights for implementing similar initiatives in educational institutions.

Keywords: Cybersecurity Awareness, Personal Data Protection Act 2010, University Students

PID 213

User Experience Measurement Using SUPR-Q Instrument for Over Time Usage

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Standardized User Experience Percentile Rank Questionnaire (SUPR-Q) is a measure that is suitable for use to evaluate the product or system, such as mobile applications, and websites with transactional features. Therefore, this study aims to measure the user experiences of the e-procurement system for over time usage with SUPR-Q. This study is quantitative, which uses the SUPR-Q instrument for data collection. Four variables are involved for the overtime measurement: usability, trust, loyalty, and appearance. The results revealed the loyalty of users, in which they are likely to return to use the system in the future, and are likely to recommend this system to a friend. Moreover, the findings also show that the system is attractive as well as clean, and has a simple presentation. The e-procurement users felt confident in conducting their business on the system. In addition, in terms of usability, the users felt that the e-procurement is easy to use and navigate within the system. SUPR-Q may be a useful option for researchers who require a brief tool for evaluating the system in terms of subjective user experience because it has fewer items. This study may be useful to e-procurement management, system developers, and designers to emphasize interface design and system development principles.

Keywords: User Experience, Validation, SUPR-Q

PID 216

Comparative Analysis of Machine Learning Algorithms for Malicious URL Detection

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The proliferation of malicious Uniform Resource Locators (URLs) poses a significant cybersecurity threat, facilitating phishing attacks, malware distribution, and fraudulent activities. Traditional rule-based filtering techniques often struggle with the dynamic nature of these threats, resulting in high false positive and false negative rates. This study explores the application of machine learning algorithms for effective URL classification to address these challenges. It aims to identify the most robust approach for distinguishing between benign and malicious URLs. Four widely used machine learning models—Random Forest (RF), Decision Tree (DT), Support Vector Machine (SVM), and k-nearest Neighbours (KNN)—were evaluated using a dataset sourced from Kaggle. The dataset was pre-processed and optimised through instance selection techniques, including Random Selection and Data Reduction based on Locality-Sensitive Hashing (DRLSH), to improve computational efficiency and model generalisation. Performance was assessed based on key classification metrics, including accuracy, precision, recall, and F1-score. Experimental results for this study indicate that the RF classifier, when trained on the DRLSH-processed dataset, achieved the highest accuracy (98.20%), demonstrating its superior capability in identifying malicious URLs while minimising classification errors. These findings underscore the importance of instance selection in refining dataset quality and enhancing model performance. The study provides valuable insights into optimising machine learning-based cybersecurity solutions and contributes to developing more effective URL filtering mechanisms. Future research should explore integrating deep learning techniques and real-time threat intelligence to further strengthen malicious URL detection systems.

Keywords: Cybersecurity, Machine Learning, Malicious URLs, URL Filtering, Random Forest

PID 218

Augmented Reality Storytelling: Re-Living The 1821 Kedah-Siam War at Kota Kuala Kedah

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This paper explores the integration of Augmented Reality (AR) technology in storytelling, specifically within the context of cultural heritage and museum experiences. AR enables the blending of digital content with the real world, transforming traditional museum exhibits into dynamic, immersive environments. By overlaying multimedia elements such as graphics, animations, and videos, AR enhances the understanding of historical narratives and engages visitors interactively. The paper focuses on the implementation of AR in re-telling the 1821 Kedah-Siam War at Kota Kuala Kedah. Through the use of mobile devices and QR codes, visitors can access AR content, enriching their learning experience without altering the physical exhibits. The study assesses the impact of AR on visitor engagement, usability, and the effectiveness of cultural heritage interpretation through the Short User Experience Questionnaire (UEQ-S). The findings indicate that AR significantly enhances visitor experiences by providing engaging, innovative, and informative content. These results highlight AR's potential in revitalising historical storytelling and offer insights into its role in making cultural heritage more accessible and compelling. This approach not only fosters a deeper understanding of historical events but also supports lifelong learning and the preservation of cultural identity.

Keywords: AR, Historical Event, Immersive Technology

PID 219

Prediction of Student Intake, Enrollment and Output (IEO) Using Exponential Smoothing Methods for Analytics Dashboard: A Case Study of Malaysian Public Universities

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Predictions of student intake, enrolment, and output (IEO) are vital for sustaining the university's long-term operations in providing good quality academics. The IEO descriptive analysis can be used to monitor academic programs key performance indicators (KPI), and predictive analysis assists in decision-making for planning and controlling future resources such as academic staff, facilities, and services. Although limited data is available, Exponential Smoothing methods for trends can predict the IEO and should be embedded in the analytics dashboard. Therefore, this study aims to produce the IEO prediction analytics dashboard using Exponential Smoothing methods for all public universities in Malaysia. IEO data were obtained from the Ministry of Higher Education (MoHE) for 20 public universities from 2021 until 2024, but only three universities were selected as the case study for this paper and named as Universities 1, 2, and 3 anonymously. Two Exponential Smoothing methods, Holt's and Damped Trend, were used to predict the IEO and compared based on Root Mean Square Error (RMSE). The results showed that theoretically, Holt's is better when using RMSE, but practically, Damped Trend is more appropriate in reflecting the accuracy of the IEO predictions from 2025 until 2030 based on information obtained from the universities coordinators. Successfully, the IEO prediction analytics dashboard for all public universities was generated. The dashboard is an essential tool for regularly monitoring the IEO for fast and timely usage by the management of universities in decision-making for planning and controlling resources.

Keywords: Dashboard, Exponential Smoothing, IEO prediction

PID 220

Enhancing Diagnostic Accuracy for Breast Cancer Using Classical-Quantum Hybrid and Transfer Learning Technique

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As everything is gradually digitized and the data around us increases, faster technology is necessary. Quantum Computing is said to be the next generation of computers that will be faster and can solve problems that current computers cannot solve. In this research, we aim to study the enhancements that quantum transfer learning models can provide to improve the detection of breast cancer. Although traditional machine learning and deep learning have proven effective, we still face challenges with high-dimensional and complex medical data. Quantum Computing might be a potential solution for handling more complex data. This study proposes a hybrid model combining a classical pre-trained deep learning model (ResNet50) with different variational quantum circuits, including simple, entangled, and advanced ones. Our study focuses on identifying the best model regarding accuracy and computational efficiency. A hybrid model with an entangled variational circuit outperformed traditional transfer learning and other Classical-quantum hybrid models. Meanwhile, the traditional transfer learning model was the best in computational resource utilization.

Keywords: Quantum machine learning, transfer learning, breast cancer, healthcare

PID 221

Machine Learning for Early Mental Health Detection in Higher Education Staff Using Health Screening Data

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Mental health in the workplace is a critical issue that demands proactive measures from employers. Typically, the human resource department implements intervention programs and activities to support employees morally and spiritually. With advancements in technology, particularly artificial intelligence (AI) and machine learning's ability to identify patterns, organizations can better detect departments or units with potential mental health concerns, enabling early intervention. This study focuses on significant features such as department, role (academic or administrative staff), age, position, and salary grade to assess mental health well-being among university staff. Nine (9) machine learning techniques are applied to analyse data. Data from 1,388 instances with 31 features of various departments, were collected, and evaluated. The findings reveal, surprisingly, that the Logistic Regression approach outperforms other algorithms. Expanding the dataset to include information from different years and other universities would yield clearer, more robust, and comprehensive insights into mental health trends among university staff, ultimately aiding in the development of more effective workplace mental health strategies.

Keywords: Health Psychological Prediction, Machine Learning Techniques, Employee Mental Health, Academic Mental Wellbeing, Public University Workplace.

PID 224

A Model of Secure Behavioral Intentions in the Context of Online Game Addiction: Insights from Malaysian Adolescents

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Online Game Addiction (OGA) refers to problematic conditions characterised by excessive and compulsive engagement in online gaming activities. Despite existing models and solutions, the impact of online game usage among adolescents persists, leaving them vulnerable to cyber threats such as phishing attacks. This study aims to develop a Secure Intention Behaviour (SIB) model to examine the cybersecurity-related behavioural intentions of adolescents in Higher Learning Institutions (HLIs), drawing on the extended Protection Motivation Theory (PMT). Utilising a quantitative approach, a survey based on simple random sampling was conducted across four Malaysian regions (Southern, Northern, Eastern, and Central). From the 850 distributed questionnaires, 660 were deemed usable for analysis, representing an impressive 84% valid response rate. Partial Least Squares-Structural Equation Modelling (PLS-SEM) was then employed for analysis. Findings confirmed most hypothesised relationships, except for Perceived Vulnerability and Protection Motivation. Notably, Online Game Addiction Severity (OGAS) significantly moderated several key relationships, underscoring its influence on adolescents' security intentions. The SIB model demonstrated strong predictive accuracy and robustness, further validated through expert content analysis. This study contributes a novel framework integrating behavioural addiction and cybersecurity risk, offering valuable insights for developing targeted interventions and educational strategies. The findings enhance PMT-based cybersecurity models by deepening understanding of secure behavioural intentions in the context of OGA, informing future research and youth-focused digital safety policies.

Keywords: Behavioural Addiction, Cyber Threat, Online Game, Protection Motivation Theory (PMT), Secure Intention Behaviour.

PID 225

SignLearn: Application for Learning Sign Language

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Sign language is the primary language and hearing-impaired people communicate with other people through finger, shape, position and hand movement and facial expressions. Most people in society are unfamiliar with sign language and there is a significant communication gap between the deaf or dumb and the public. The lack of resources and difficulty of learning sign language has resulted in many people who are interested in giving up. However, sign language should be learned more widely and the way to learn it must become easy, so that those who need it are not ignored and the barriers they face in society are reduced. This article is to develop a mobile application called SignLearn to make learning sign language easier and more effective. The application will focus on teaching basic and daily expressions in American Sign Language (ASL), the most widely used sign language. SignLearn is developed in four main stages: requirements planning, user design, construction, and cutover. The application was evaluated by 30 respondents. It can be concluded that the application was successfully delivered, and the results show that the respondents were satisfied with the overall application's features and performance. The application provides a dictionary function allowing the user to look up specific words directly. As well as providing videos and quizzes to further enhance the interest. The application can bring attention to the importance of sign language and as more people know it, deaf or dumb people will be able to communicate with others without barriers.

Keywords: Sign Language, Hearing-Impaired, American Sign Language

PID 226

A Preliminary Investigation on The Challenges and Enhancements for Flood Disaster Management

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Floods can have devastating impacts on communities and infrastructure. In Malaysia, as in many countries, heavy rains during monsoon seasons can lead to severe flooding. This can disrupt daily life by damaging essential infrastructure like bridges, railway tracks and roads, making travel difficult and impacting local economies. Properties and vehicles can be heavily damaged, leading to significant financial losses for individuals and businesses. Addition-ally, floods pose serious risks to safety and can lead to the tragic loss of lives. The Northern region of Kedah, Malaysia, particularly The District of Kubang Pasu experiences big flood during the rainy season annually. The management of flood disaster is under the Kubang Pasu District Office with the support of several agencies including the Angkatan Pertahanan Awam Kedah. Though flood occurs every year, there are still challenges to the responsible agencies, which need to be further explored and survey for improvements. Thus, this study aims to explore the challenges of flood disaster in this region and identify more solutions. A qualitative approach was chosen for this preliminary investigation to explore challenges and possible solutions. Interviews with experts in flood management such as the Angkatan Pertahanan Awam was done to identify challenges and solutions for flood management effectiveness. Challenges identified including inadequate drainage systems, rapid development, heavy rainfall, insufficient public awareness, and a lack of coordination among disaster management agencies. The proposed recommendations proposed are i) Having Effective Infrastructure Development, ii) Developing flood management scheme, iii) Strengthening early warning systems, iv) Initiating public awareness campaigns, and v) Promoting Inter-agencies Collaboration. By addressing these areas, the study suggests that the impact of flooding can be mitigated, and there will a better preparation for communities' safetyness in the event of flood in the future. The study finally presented a framework of critical elements towards strengthening flood risk management.

Keywords: Disaster and Crisis Management, Disaster Mitigation, Disaster Risk Reduction

PID 227

Implementation of Support Vector Machine Architecture for Anomaly Detection in IoT Networks

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Internet of Things (IoT) is a technology that allows various physical devices to connect to each other and exchange data via the internet network. The application of IoT is increasingly widespread in various sectors such as smart homes, manufacturing industries, smart agriculture, and healthcare. However, along with the increasing number of devices and the volume of data traffic sent, the potential risk of cybersecurity threats is also increasing. The large number of IoT devices that have limited computing capabilities makes the system more vulnerable to various attacks, including intrusion, exploitation of system weaknesses, and Distributed Denial of Service (DDoS) attacks. Therefore, early detection of anomalies in network traffic is a crucial aspect to maintain the security and stability of IoT systems. This study aims to develop and implement a Support Vector Machine (SVM)-based architecture as a classification method in an anomaly detection system on an IoT network. SVM was chosen because of its ability to handle high-dimensional data and non-linear classification effectively. The methodology used includes the process of extracting features from IoT network traffic datasets, data normalization, model training using the SVM algorithm, and evaluating model performance in distinguishing between normal and anomalous traffic. Thus, the implementation of SVM architecture can be an effective and efficient solution in intrusion detection systems for IoT networks. This research also opens up opportunities for the development of more adaptive security systems by integrating machine learning-based detection models into large-scale IoT infrastructures.

Keywords: Internet of Things, Anomali, Deteksi, Support Vector Machine, Network Security

PID 228

Deep Learning Approach to Sign Language Recognition: An Inclusive Solution for Hajj Pilgrims

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Hajj pilgrimage is not only performed by normal people, but can also be performed by people with disabilities, such as deaf people, therefore this study proposes a deep learning approach for sign language recognition, specifically Indonesian Sign Language (BISINDO), using two leading object detection models, YOLOv8 and YOLOv11, for inclusive applications for disabled hajj pilgrims. The dataset used in this study consists of images representing hand gestures in BISINDO, which is designed to recognize non-verbal communication from disabled hajj pilgrims who have hearing and speech impairments. The YOLOv8 and YOLOv11 models are drilled to detect and classify hand gestures used by hajj pilgrims, thus enabling better interaction during hajj. The results show that YOLOv8 provides higher detection accuracy than YOLOv11, significantly in-creasing the mean average precision (mAP) across training periods. In the 60th period, YOLOv8 achieved an mAP of 0.963, while YOLOv11 recorded an mAP of 0.960. This study shows that the application of YOLO-based object detection technology in the context of BISINDO iconic language recognition can improve accessibility and communication for disabled pilgrims, thereby enhancing their spiritual experience. This approach offers an inclusive solution that can be integrated with support systems in the Holy Land.

Keywords: Sign language recognition, YOLOv8, YOLOv11, object detection, Indonesian Sign Language (BISINDO), deep learning

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