



ICICSE 2023

6TH INTERNATIONAL CONFERENCE ON
**INTERDISCIPLINARY COMPUTER
SCIENCE AND ENGINEERING**

*“Sustainable Interdisciplinary Computer Science and
Engineering in the COVID-19 Endemic Era”*

22 AUGUST 2023

PROGRAMME BOOK

Organized by



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Message from the Vice Chancellor
of Universiti Putra Malaysia

Assalamualaikum W.B.T. and warm greetings to all,

Praise is owed to Allah SWT, for by His grace, the Faculty of Computer Science and Information Technology (FSKTM) is able to organize the 6th edition of the International Conference on Interdisciplinary Computer Science and Engineering 2023 (ICICSE2023).

At UPM, FSKTM is widely known for spearheading research in computer science and computer engineering. Much of its research areas draw expertise from various disciplines to ensure our knowledge and proficiencies are on par with global researchers.

We at UPM acknowledge that the Computer Science and Information Technology field has advanced tremendously in the last 50 years and has gained traction in its application. Considering fast-paced changes in the era of IR 4.0 combined with post-pandemic needs, it is highly suitable to delve into discussions on the "Sustainable Interdisciplinary Computer Science and Engineering for an Era of Endemic COVID-19".

With this being the conference theme, we hope to learn about the developments in Computer Science and Information Technology to develop even more robust interdisciplinary research that will lead to sustainable development in our communities and societies.

Without a shadow of a doubt, emerging technologies such as the Internet of Things (IoT), cloud computing, artificial intelligence, edge computing, forged computing, wireless networks, sensor networks, cyber security, and quantum computing can be utilized to solve real-world problems. Through their advancements, solutions will be made possible in various sectors such as healthcare, agriculture, education, the environment, sports and games, recreation, and many more.

Organizing a conference such as ICICSE2023 requires high levels of dedication and teamwork. Therefore, I would like to congratulate and thank the organizing committee for making this conference a success. Finally, I hope ICICSE2023 will bind us in paving the pathway towards excellence.

Thank you very much.

Ybhg. Dato' Prof. Dr. Mohd Roslan Sulaiman
Vice Chancellor
Universiti Putra Malaysia



Message from Dean

Faculty of Computer Science and Information Technology,
Universiti Putra Malaysia

Assalamualaikum wbt and Greetings to all,

Praise be to Allah, that the Faculty of Computer Science and Information Technology (FSKTM) is organising the sixth International Conference on Interdisciplinary Computer Science and Engineering 2023 (ICICSE2023). In Universiti Putra Malaysia (UPM), FSKTM is responsible for leading research in the areas of computing and engineering.

The main objective of ICICSE2023 is to provide an opportunity and a platform for the participants to share and exchange their brilliant ideas, and original works in research, and to build mutually beneficial international links. I hope this conference can help in creating a bright picture and enchanting landscape for state-of-the-art research and practice on related topics in computer science and engineering. I hope this conference be able to open many new research collaborations.

I would like to thank the keynote speakers and the presenters for contributing their papers to this conference. Thank you for attending this conference and bringing your expertise and research findings to this event. Your vision, contributions, and participation will help us build and pave the way into the future of computing and engineering. I hope that all of you will find ICICSE 2023 relevant, interesting, exciting, and inspiring. I also would like to thank and congratulate all the committee and organizing team for their hard work.

With very best wishes and kindest regards.

A handwritten signature in black ink, appearing to read 'Razali Yaakob'.

Assoc. Prof. Dr. Razali Yaakob
Dean
Faculty of Computer Science and Information Technology,
Universiti Putra Malaysia



Message from ICICSE2023 General Chair

Assalamualaikum w.b.t . and greetings to all,

The sixth International Conference on Interdisciplinary Computer Science and Engineering 2023 (ICICSE2023) is held virtually on 22 August 2023. This conference series is aiming to increase collaboration and provide an opportunity for academicians, researchers, engineers, technologists, scientists, industrial professionals, and students from around the world to build up a good networking relationships as well as having scientific discussions on the latest developments in the fields of Computer Science and Engineering. Even it is a biggest challenge to bring them up together but we hope this conference series is the stepping stone to inspiring them collaborating in the interdisciplinary research. Our conference theme for this year is 'Sustainable Interdisciplinary Computer Science and Engineering for an Era of Endemic COVID-19'. Having said that, we are offering five tracks to cover five interdisciplinary areas: Computer Network and Distributed System (CNDS), Artificial Intelligent and Big Data (AIBD), Software Engineering and Information System (SEIS), Multimedia and Information Retrieval (MIR) and Cyber Security (CS) for the researchers to discuss their research findings on various issues in computer science and engineering technology for the benefits of community development.

Since 2017, we are having continuous support from computer science and engineering researchers to enable ICICSE to become an established forum in computer science and engineering. It is my pleasure to announce we have received number of accepted submissions to be presented at this sixth conference. These presented papers will be published in a Scopus Indexed journal; Journal of Advanced Research in Applied Sciences and Engineering Technology. We are also honoured to have two distinguished keynote speakers; Prof. Dato' Dr. Shamala K. Subramaniam from Universiti Putra Malaysia and Ms. Piramila Poovan (Eva) from POS Malaysia. We believed the keynote sessions and the parallel sessions will add value to your knowledge and research interest.

Furthermore, we are fortunate and grateful to have generous sponsors with us this year; Bank Rakyat and Strixe Apparel Sdn. Bhd, our highly dedicated international steering committee and program committee, the management board of the Faculty of Computer Science and Information Technology (FSKTM) UPM, reviewers, and volunteers for their tremendous support in bottling this international conference together successfully. I sincerely hope that ICICSE2023 will provide a strong platform for knowledge sharing and establish more research collaboration in the future.

Thank you.

“With Knowledge We Serve”

A handwritten signature in black ink, appearing to be 'AR' with some additional strokes, positioned above a horizontal line.

Dr. Amir Rizaan bin Abdul Rahiman
ICICSE2023 General Chair

The 6th International Conference on Interdisciplinary Computer Science and Engineering 2023 (ICICSE2023)

KEYNOTE SPEAKER 1



Prof Dato' Dr Shamala Subramaniam
Universiti Putra Malaysia

PROFESSOR DATO' DR SHAMALA SUBRAMANIAM is a Professor in the Department of Communication Technology and Networks, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia. She serves as the Chairman for Ph.D. and Master's Thesis Supervisory Committee. She has a high number of cited publications in reputed high impact and indexed journals. She has authored Chapter (s) in book and lecture series. She has been recognized as a Member of Editorial Advisory Board in national and international journals. She has addressed keynote in several national and international conferences. She specializes in the area of wireless networks and distributed systems. She has secured a wide-spectrum of research grants encompassing from fundamental to applied. Prof Shamala's research in integrating wireless and distributed into sports has resulted in the first Games Management System developed in partnership with the National Sports Council. The project known as iGames has evolved from being used domestically to cater one of the largest multi-sports Games to an international platform which was the South East Asia Games in Cambodia 2023. Subsequently, another research project known as the IoSRocks has been copyrighted and has been harnessed to become commercially viable. She has founded the startup U Empower Sdn Bhd through the university program known as Innohub which is aimed at transcending research to the commercialization domain. Prof Shamala is very passionate about sports. She represented the national women's hockey team and has served in many national and international administrative sports positions. She also won the Olympic Council of Malaysia Women in Sports Award, was awarded the Asian Hockey Federation Order of Merit and the President's Award.

Transcending Paradigms Leveraging Interdisciplinary Dimensions of The Evolving Technology Spectrum

By:

Prof. Dato' Dr. Shamala Subramaniam
Universiti Putra Malaysia

The paradigms which govern technology and civilization is constantly emerging with innovations and transforming the definition of norms. These require pre-requisites encompassing the pillars which constitute the Industry Revolution 4.0 (IR4.) and the subsequently revolutions. This talk will discuss the ability to harness the wide spectrum of rich resources and discover the profound impact that technology transformation is having on industry innovation, explore the challenges and opportunities that this presents, and consider the significant implications. Subsequently, leveraging co-existence strategies to address particularly, the Internet of things (IoT) as a driving force behind further densification. This keynote will discuss the LiFi technology, which stands for light fidelity role in addressing the challenges emerging from densification and as a factor to optimize co-existences and interdisciplinary dimensions. Complementary to the underlying networks is the management of a pertinent factor in IoT which is mobility management which will be presented in the context of mobility management algorithms. Next, the talk addresses the significant and high impact of the correlation between sports and technology. The realization of an idea is largely attributed to the ability of a researcher to deploy strategies to evaluate and gauge the actual performance of this idea. The field of computer networks encompasses a fundamental platform of governance for complementary embedded areas of research in sports. The graceful evolution and co-existence of technology has also shown a tremendous impact on sports performance analysis strategies that are developed and deployed. Sports performance analysis strategies which have dominantly focused on measurement, analytical and simulation are constantly being enhanced and elevated to meet the evolving areas of sports. The wide spectrums of sports areas are imposing multiple pre-requisites in developing the performance analysis strategies. These include the abstractions of systems and their respective mapping to performance analysis methods such as Discrete Event Simulation, mobile applications, the Internet of Things (IoT), the attributes of components, the coherence of the multiple layers relevant to the domain, mobility preferences and other elements. Performance analysis in sports strategies need to engage into depicting these evolving features and strategies to represent them must always be pursued. This talk will discuss the innovation developed to furnish the world of sports.

KEYNOTE SPEAKER 2



Piramila Poovan (Eva)
POS Malaysia

MS. PIRAMILA POOVAN (EVA) is a Senior Vice President and Head of Analytics and Business Insights at POS Malaysia. She is a data expert and has been in the digital field for over 18 years. She is also a Board of Directors for the DAMA Malaysia Chapter. She has set up and transformed many organizations as insight-driven organization. She is skilled at understanding business problems and delivers customer-centricity through digital marketing. At POS Malaysia, she has created a new setup of core team in ACOE - data analyst, BI, data scientist, AI/ML engineer, data engineer, business analyst, data governance and management, focusing into a more data-driven organization and deriving data into business value. She is great at providing data solutions with the right platforms and has extensive experience in understanding customer behaviours. Previously, she has worked with Philip Morris International in FMCG & Tobacco Manufacturing, and Astro Malaysia Holdings in Broadcast Media & Content Publishing. One of her biggest achievements was personalization of content driven by AI using Microsoft Azure and Google, which drove 258% clickthrough rate and 55% content sharing uplift in customer engagement on the sports content publishing site for Astro that was launch APAC level. In 2020, she has been invited by Salesforce to provide experience and sharing of how the tobacco industry has embarked on consumer centricity and how advanced analytics and AI is leveraged using Salesforce for connecting the customers closer to the heart of Philip Morris. The following year, she was an invited speaker at the e-Tail Asia Virtual Summit 2021 and provided a landscape of how tobacco industry embarked into digital transformation using data analytics and strategy choosing the right digital technology, omni-channel approach and cloud services to host the data for data management and governance while tracking the performance of commercial and acquisition growth in different areas of consumer journey map using predictive analysis and combination of 1 st, 2nd and 3rd party data integration. In 2022, she shared how to deliver a consumer centricity with the right analytics framework in an executive roundtable session at the Data & Analytics Summit, in Sydney, Australia. In addition, she enjoys consulting and coaching individuals to upskill their knowledge and experience, and believes that the right solution will always deliver the right quality results.

Towards a Sustainable Future: Harnessing the Power of Data and Analytics

By:

Piramila Poovan (Eva)

POS Malaysia

The world has changed. Businesses are making gradual adjustments to the reality of climate change. Many have launched new projects aimed at measuring the production of their carbon emissions with the long-term objective of significantly reducing them. Customers and investors look to you for ethical behaviour when it comes to how you treat people and the environment. It's not enough to turn a profit. You must have a lasting impression and difference. Change is not only necessary, it's essential if you want to fulfil the promise of your ESG (Environmental, Social, and Governance) and sustainability strategy.

At POS Malaysia, we are proud to play our part in creating a greener, sustainable future. Today, we shine a light on our fleet of electric bikes that have been silently whizzing through streets, delivering mail and parcels. In line with our Sustainability Roadmap, we are resolutely marching towards our target of achieving net zero carbon emissions by 2050. Now that companies have discovered the business value of sustainability, they want to make the most of it by harnessing the different data points that can be used as a metrics in making informed decision promptly for business to continuously run effectively.

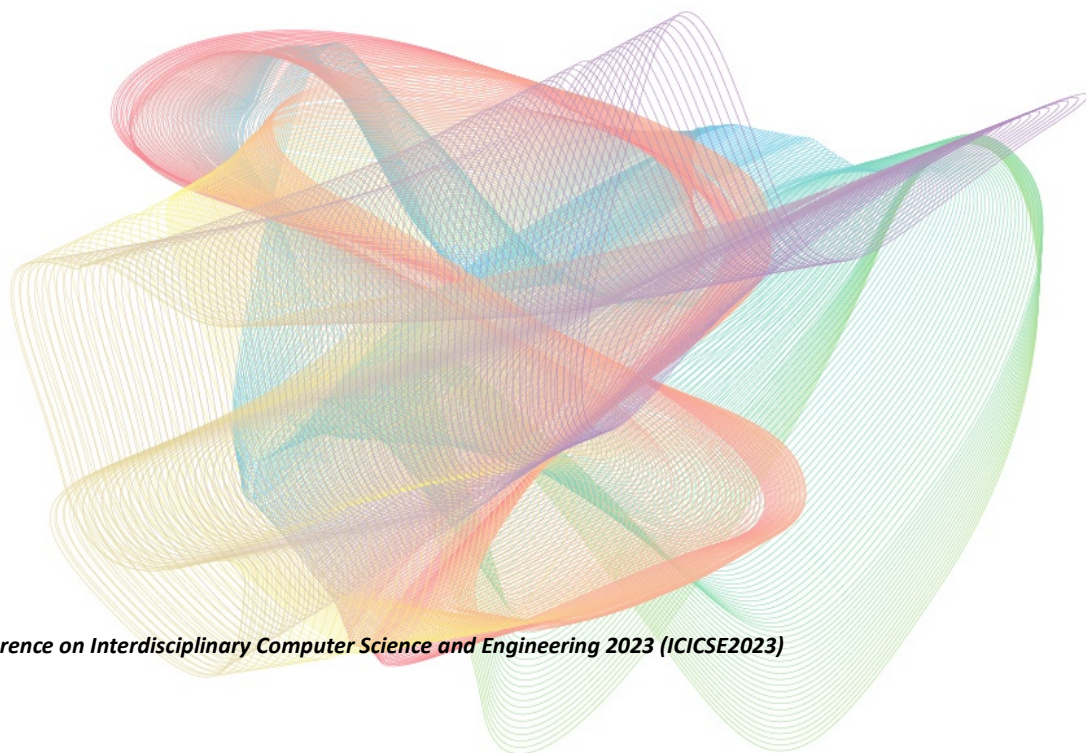
Data ideally exists in structured tables, columns, and rows, facilitating mining for valuable information. Data often exists as unstructured with the trending content engagement and social media, ingested as raw information in vast data lakes. Structured data adheres to predefined models with rules for processing and access, while unstructured data encompasses various formats like images, audio, video, and documents. An example is the structured date and time of an email versus its unstructured content.

Raw data regardless is structured or unstructured, without making it into a readable format, it is meaningless. Data processing is imperative and involves various stages, starting with data collection from disparate sources, eliminating data inconsistencies, analysing it using advanced analytics tools and algorithms, and revealing valuable insights and trends to identify opportunities for sustainability improvements and enhance their decision-making capabilities. Establishing robust data governance and management frameworks is crucial for building ethics around the data practices. This includes ensuring data quality, security, and accessibility while complying with relevant regulations. Additionally, adopting cloud-based storage and data integration technologies can streamline data processes, fostering collaboration and efficiency. This is the process of transforming your raw data into meaningful insights and stories that can inform your decisions and actions.

Harnessing data is a core component in analytics. Building a central source of truth by connecting different systems is also crucial to piece the data together for analytical processing. But translating the data into a meaningful insights is the key driver for a business. Today, traditional metrics favouring short-term financial gains can hinder green efforts. Hence, integrating sustainability metrics into business processes allows balanced optimization models for financial and non-financial goals. This is where analytics drives the decision and builds towards continuous improvement for business to sustain. With the meaningful metrics, analytics now becomes significant when it identifies causes of past events and using historical data to understand outcomes. Most modern tools today enable real-time sustainability analysis across past, present, and future data. This

approach empowers companies to make informed decisions for a greener future. You should use data analysis and visualization tools and techniques, such as dashboards, charts, graphs, maps, or infographics, to present your impact data in a clear, concise, and compelling way, compare your impact performance and indicators against your goals and benchmarks.

With the entire data and analytics on a cloud platform, harnessing the data into a storytelling, allows analytics maximize the impact into an organization's core strategy. A “greener” reusable, flexible and scalable data & analytics framework helps identify profitable and sustainable practices. Embracing sustainability enhances reputation and competitiveness, attracting conscious consumers and investors. Last but not least, data-driven initiatives foster trust and loyalty to drive growth, identifying areas for improvement and promoting responsible growth for a sustainable future.



TENTATIVE PROGRAMME

6th International Conference on Interdisciplinary Computer Science and Engineering 2023 (ICICSE2023)

22 August 2023, Tuesday

Venue: Dewan Abdul Azim, FCSiT, UPM

8.15 am – 8.45 am	Registration Online: https://www.facebook.com/fcsitupm
9.00 am – 9.20 am	ICICSE2023 Opening Ceremony <ul style="list-style-type: none">• <i>Putra Gemilang, Negaraku songs and Doa recitation</i>• <i>Welcoming speech by Dr. Amir Rizaan Abdul Rahiman – ICICSE2023 Chairman</i>• <i>ICICSE2023 Opening speech and officiating – Dean, Faculty of Computer Science and IT, UPM</i>• <i>ICICSE2023 Montage</i>
09.25 am – 10.25 am	Keynote Speech 1 – Prof. Dato’ Dr. Shamala K. Subramaniam <ul style="list-style-type: none">▪ <i>Transcending Paradigms Leveraging Interdisciplinary Dimensions of The Evolving Technology Spectrum</i>▪ <i>(Q&A Session – 15 minutes)</i>
10.25 am – 10.40 am	Refreshment
10.40 am – 11.40 am	Keynote Speech 2 – Ms. Eva Piramila Poovan <ul style="list-style-type: none">▪ <i>Towards a Sustainable Future: Harnessing the Power of Data and Analytics</i>▪ <i>(Q&A session – 15 minutes)</i>
11.40 am – 12.00 pm	Token presentation and Photo Session
12.00 pm – 2:00 pm	Break and Lunch Time
2.00 pm – 5.30 pm	Presentation Session
5.30 pm	ICICSE2023 Closing ceremony <ul style="list-style-type: none">▪ <i>Announcement of Best Paper award</i>▪ <i>Deputy Dean (Research and Innovation)</i>
5.45 pm	Coffee Break & Dismiss

PRESENTATION SESSION

2:00 am – 5:30 pm (22nd August 2023)

Venue for Physical Presentation:

Dewan Abdul Azim, FCSiT, UPM

Link for ICICSE2023 Online Presentation:

<https://us06web.zoom.us/j/84391357369?pwd=VmJibS9XZD2hnVXVxUDJDaHQ2aXpwZz09>

Session Chair: Mrs. YM Raja Azlina Raja Mahmood

No.	Paper ID	Time (pm)	Title of Paper	Author
Track: Software Engineering and Information Systems				
1.	325 (F2F)	2.00	A Study on Mental Health of Higher Education Students in Malaysia During Covid-19 Pandemic	Rohaya Latip , Sazlinah Hasan, Farah Hanis, Mohd Ali Khameini, Mazen Farid
2.	9766 (F2F)	2.20	Machine Learning Software Component Quality: Current Status, Challenges, and Future Directions	Mohamed Abdullahi Ali , Ng Keng Yap, Hazura Zulzalil, Novia Indriaty Admodisastro and Amin Arab Najafabadi
Track: Cyber Security				
3.	9512 (F2F)	2.40	Secure Communication between Internet of Things Devices using Blockchain	Nur Izura Udzir , Elham Aldhamari, Noor Afiza Ariffin, Nuur Alifah Roslan and Thinagaran Perumal
4.	9289 (Online)	3.00	Data Protection with Aggregation Approach for Decision-Making: Divide-and-Conquer Scheme	Mohd Anuaruddin Bin Ahmadon and Shingo Yamaguchi
Track: Computer Network and Distributed Systems				
5.	9473 (Online)	3.20	A Study of the High-Performance Computing Parallelism in Solving Complexity of Meteorology Data and Calculations	Masnida Hussin and Mohd Ridhuan Noor Affendi
Track: Artificial Intelligence and Big Data				
6.	5995 (Online)	3.40	A Multi-Step Preprocessing Method for Denoising and Enhancing Ancient Chinese Characters	Luyao Sun , Noridayu Manshor, Fatimah Khalid
7.	9184 (Online)	4.00	HDN-Net: A Hybrid Deep Neural Network to Improve Iris Recognition in Unconstrained Environments with Eyeglasses	Jasem Malgheet , Noridayu Manshor, Lilly Affendey and Alfian Halin
8.	8884 (Online)	4.20	Air Quality Prediction using Ensemble Classifiers and Single Decision Tree	Tanisha Madan , Shrdha Sagar, Deepali Virmani and Deependra Rastogi
Track: Multimedia and Information Retrieval				
9.	7845 (Online)	4.40	The UX Evaluation of the Prototype Development Sport Facility Booking System	Muhammad Aliff Ashraff Zulkiffli, Azrina Kamaruddin , Nusrat Akter Lovely and Rupai Aneem Al Ahsan
10.	9620 (Online)	5.00	Controlling 3D Gear Box using Gesture Technology	K. Martin Sagayam, Thusnavis Bella Mary I., Amir Anton Jone, J. John Paul, Tony Jose, Benny Noah Regan J, Mohd Helmy Abd Wahab and Nabihah Ahmad

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