Conference Program

2024 14th International Conference on Software Technology and Engineering (ICSTE 2024)

Workshops

2024 7th International Conference on Frontiers of Image Processing (ICFIP 2024)

2023 3rd International Conference on Video and Signal Processing (ICVSP 2024)

August 16-18, 2024

Macau, China (Virtual Conference)

Technical Supporters

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Yujia Li, Chinese Academy of Medical Science, China

Chao Zeng, University of Hamburg, Germany

Rubita Sudirman, UTM, Malaysia

Chunhui Yang, Chinese Academy of Medical Science, China

Welcome Message

I'm Sergei Gorlatch from University of Muenster, Germany. Firstly, on behalf of the conference organizing committee, I would like to express our warmest welcome to your participation in the event.

The main purpose of the conference is to provide a forum for researchers, practitioners, and professionals from the industry, academia and government who are working in the fields of software technology and engineering, image and signal processing, computer technologies, networks and communications to have an active discourse on research and development, as well as professional practice in related fields.

In the technical part, the conference adopts peer-review method which controlled the quality of the articles and laid a solid foundation for the success of the conference. Please accept our thanks to the program committee and technical committee members for their timely and professional reviews.

OK, now, please let me give a brief introduction of our conference agenda. Conference lasts for three days. First of all, we will have three keynote speakers to share their latest researches with us, they are Prof. Rajkumar Buyya (Fellow of IEEE, Foreign Fellow of Academia Europaea, Redmond Barry Distinguished Professor, Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory) from University of Melbourne, Australia, Prof. Chen Changwen (Member of Academia Europaea, Fellow of IEEE, Fellow of SPIE, Chair Professor of Visual Computing), from The Hong Kong Polytechnic University, China, and Prof. Chau Lap-Pui (Fellow of IEEE, Global STEM Scholar (under the Global STEM Professorship Scheme)) from The Hong Kong Polytechnic University, China

At the same time, this year we have invited 3 outstanding Session keynote lecturers: Assoc. Prof. Deshinta Arrova Dewi, INTI International University, Nilai, Malaysia, Prof. Paulo Batista, University of Évora, Portugal, and Prasad Venkatachar, Pliops, USA.

For the following agenda, presentations with the latest research, advances and trends sharing will be shared with us. During the conference, we will always be pleased to assist you if needed. Through the collaborative efforts made by everybody, I believe that our conference will get success.

Lastly, please let me express my sincere concerns and wishes to all of you again. Please take care of yourself and your family: stay healthy. Thank you!

Conference Chair

Sergei Gorlatch

University of Muenster, Germany

Time Zone

UTC/GMT+8

Online APP

ZOOM Download Link: https://zoom.us/download
ZOOM Using & Presentation Instruction:
http://www.icste.org/kits.rar

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Rename Screen Name Before Entering the Room	Examples
Authors: Paper ID-Name	MC1001-San Zhang
Delegate: Delegate- Name	Delegate-San Zhang
Keynote Speaker: Keynote-Name	Keynote-San Zhang
Committee Member: Committee-Name	Committee-San Zhang

Materials Prepared by the Presenters

✧ **Oral Presentation:**

PowerPoint or PDF files

PowerPoint Background Template: http://www.icste.org/kits.rar

Duration of Each Presentation

✧ Keynote Speech: 45 Minutes of Presentation including Q&A.

✧ Session Keynote Lecturer Speech: 25 Minutes of Presentation including Q&A.

✧ Regular Oral Presentation: 15 Minutes of Presentation including Q&A.

Note

✧ The regular oral presentation time arrangement is for reference only. In case any absence or some presentations are less than 15 minutes, please join your session before it starts.

An excellent presentation will be selected from each session which will be announced and awarded an excellent presentation certificate.

Keynote Speaker I

August 17, Saturday, 09:05-09:50, GMT+8, Beijing Time

ZOOM Link: https://us02web.zoom.us/j/87586988633

Zoom ID: 875 8698 8633

Password: 081618

Prof. Chau Lap-Pui

Fellow of IEEE

Global STEM Scholar (under the Global STEM Professorship Scheme)

The Hong Kong Polytechnic University, China

Speech Title: Recent Developments in Vision-based Vehicle Re-identification

Abstract: Video monitoring in intelligent transportation systems has become a research focus in recent years and the resulting large volumes of video data. Vehicle re-identification utilizes this data to locate and identify a particular vehicle across multiple non-overlapping cameras. The results of vehicle re-identification technologies have practical uses in fields like public security, smart cities, and transportation systems, enhancing user satisfaction and making transportation safer and more efficient. In this talk, we will discuss the recent technologies in vehicle re-identification.

Bio: Lap-Pui Chau received the Ph.D. degree from The Hong Kong Polytechnic University 1997. He was with School of Electrical and Electronic Engineering, Nanyang Technological University from 1997 to 2022. He is currently a Professor in the Department of Electronic and Information Engineering, The Hong Kong Polytechnic University. His research interests include machine learning, computer vision, and image & video analytics. He is an IEEE Fellow. He was the chair of Technical Committee on Circuits & Systems for Communications of IEEE Circuits and Systems Society from 2010 to 2012. He was general chairs and program chairs for some international conferences. Besides, he served as associate editors for several IEEE journals and Distinguished Lecturer for IEEE BTS.

Keynote Speaker II

August 17, Saturday, 09:50-10:35, GMT+8, Beijing Time

ZOOM Link: https://us02web.zoom.us/j/87586988633

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Password: 081618

Prof. Chen Changwen

Member of Academia Europaea

Fellow of IEEE, Fellow of SPIE

Chair Professor of Visual Computing

The Hong Kong Polytechnic University, China

Speech Title: New Paradigm in Visual Computing: From Algorithms to Systems with New Technical Challenges

Abstract: Visual computing, traditionally, is a generic term for all computer science disciplines dealing with images, videos, and other types of visual data. These disciplines mainly include computer graphics, image processing, visualization, computer vision, virtual and augmented reality, and video analytics. This talk shall analyze contemporary visual computing systems from several systematic perspectives. First, contemporary visual data acquisition has shifted from the laboratory in the early days to the fields in recent years with new technical challenges emerging on the visual sensing front. Second, massive visual data acquired for a very diverse range of applications require high-performance computation of visual data via cloud computing. Such extension of visual computing to both the front-end and the back-end of the contemporary system now demands pervasive networking to effectively transport such volumetric visual data back and forth. Therefore, the networking of visual data has now become a critical component in the new paradigm of contemporary visual computing systems which has not been adequately studied before. The investigation of visual computing systems now needs to be vitally deepened to facilitate the researchers to traverse across new domains of exploitation. Several examples of emerging applications with unique design principles will be presented to illustrate the technical challenges we are facing and the potential broad impacts that contemporary visual computing systems are capable of creating in this new era.

Bio: Chang Wen Chen received his BS from the University of Science and Technology of China in 1983, MSEE from the University of Southern California in 1986, and Ph.D. from the University of Illinois at Urbana-Champaign in 1992. He is currently Chair Professor of Visual Computing at The Hong Kong Polytechnic University. Before his

current position, he served as Dean of the School of Science and Engineering at The Chinese University of Hong Kong, Shenzhen from 2017 to 2020. He also served as an Empire Innovation Professor at the University at Buffalo, the State University of New York from 2008 to 2021. He was Allen Henry Endow Chair Professor at the Florida Institute of Technology from 2003 to 2007. He was on the faculty of Electrical and Computer Engineering at the University of Rochester from 1992 to 1996 and on the faculty of Electrical and Computer Engineering at the University of Missouri-Columbia from 1996 to 2003.

He has served as the Editor-in-Chief for IEEE Trans. Multimedia from January 2014 to December 2016, and the Editor-in-Chief for IEEE Trans. Circuits and Systems for Video Technology from January 2006 to December 2009. He has been an Editor for several other major IEEE Transactions and Journals, including the Proceedings of IEEE, IEEE Journal of Selected Topics in Signal Processing, IEEE Journal of Selected Areas in Communications, and IEEE Journal of Emerging and Selected Topics in Circuits and Systems. He has chaired several major IEEE, ACM, and SPIE conferences that are related to multimedia communications and signal processing.

He and his students have received 10 Best Paper Awards or Best Student Paper Awards. He has also received several research and professional achievement awards. These include the Sigma Xi Excellence in Graduate Research Mentoring Award in 2003, the Alexander von Humboldt Research Award in 2010, the University at Buffalo Exceptional Scholar – Sustained Achievement Award in 2012, the SUNY System Chancellor's Award for Excellence in Scholarship and Creative Activities in 2016, and the University of Illinois ECE Distinguished Alumni Award in 2019.

His research interests include multimedia communication, multimedia systems, Internet of Video Things (IoVT), image/video processing, computer vision, deep learning, multimedia signal processing, and immersive mobile video. He is an IEEE Fellow (2005), a SPIE Fellow (2007), and a member of the Academia Europaea (2021).

Keynote Speaker III

August 17, Saturday, 11:05-11:50, GMT+8, Beijing Time

ZOOM Link: https://us02web.zoom.us/j/87586988633

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Prof. Rajkumar Buyya

Fellow of IEEE

Foreign Fellow of Academia Europaea

Redmond Barry Distinguished Professor

Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory

University of Melbourne, Australia

Speech Title: Neoteric Frontiers in Cloud, Edge, and Quantum Computing

Abstract: Computing is being transformed to a model consisting of services that are delivered in a manner similar to utilities such as water, electricity, gas, and telephony. In such a model, users access services based on their requirements without regard to where the services are hosted or how they are delivered. Cloud computing paradigm has turned this vision of "computing utilities" into a reality. It offers infrastructure, platform, and software as services, which are made available to consumers as subscription-oriented services. Cloud application platforms need to offer (1) APIs and tools for rapid creation of elastic applications and (2) a runtime system for deployment of applications on geographically distributed Data Centre infrastructures (with Quantum computing nodes) in a seamless manner.

The Internet of Things (IoT) paradigm enables seamless integration of cyber-and-physical worlds and opening opportunities for creating new class of applications for domains such as smart cities, smart robotics, and smart healthcare. The emerging Fog/Edge computing paradigms support latency sensitive/real-time IoT applications with a seamless integration of network-wide resources all the way from edge to the Cloud.

This keynote presentation will cover (a) 21st century vision of computing and identifies various IT paradigms promising to deliver the vision of computing utilities; (b) innovative architecture for creating elastic Clouds integrating edge resources and managed Clouds, (c) Aneka 5G, a Cloud Application Platform, for rapid development of Cloud/Big Data applications and their deployment on private/public Clouds with resource provisioning driven by

SLAs, (d) a novel FogBus software framework with Blockchain-based data-integrity management for facilitating end-to-end IoT-Fog/Edge-Cloud integration for execution of sensitive IoT applications, (e) experimental results on deploying Cloud and Big Data/ IoT applications in engineering, and health care (e.g. COVID-19), deep learning/Artificial intelligence (AI), satellite image processing, and natural language processing (mining COVID-19 research literature for new insights) on elastic Clouds, (f) QFaaS: A Serverless Function-as-a-Service Framework for Quantum Computing, and (g) directions for delivering our 21st century vision along with pathways for future research in Cloud and Edge/Fog computing.

Bio: Dr. Rajkumar Buyya is a Redmond Barry Distinguished Professor and Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory at the University of Melbourne, Australia. He is also serving as the founding CEO of Manjrasoft, a spin-off company of the University, commercializing its innovations in Cloud Computing. He has authored over 850 publications and seven textbooks including "Mastering Cloud Computing" published by McGraw Hill, China Machine Press, and Morgan Kaufmann for Indian, Chinese and international markets respectively. Dr. Buyya is one of the highly cited authors in computer science and software engineering worldwide (h-index=162, g-index=360, and 142,800+ citations). He has been recognised as a "Web of Science Highly Cited Researcher" for seven times since 2016, "Best of the World" twice for research fields (in Computing Systems in 2019 and Software Systems in 2021/2022/2023) as well as "Lifetime Achiever" and "Superstar of Research" in "Engineering and Computer Science" discipline twice (2019 and 2021) by the Australian Research Review.

Software technologies for Grid, Cloud, and Fog computing developed under Dr. Buyya's leadership have gained rapid acceptance and are in use at several academic institutions and commercial enterprises in 50+ countries around the world. Manjrasoft's Aneka Cloud technology developed under his leadership has received "Frost New Product Innovation Award". He served as founding Editor-in-Chief of the IEEE Transactions on Cloud Computing. He is currently serving as Editor-in-Chief of Software: Practice and Experience, a long-standing journal in the field established 50+ years ago. He has presented over 700 invited talks (keynotes, tutorials, and seminars) on his vision on IT Futures, Advanced Computing technologies, and Spiritual Science at international conferences and institutions in Asia, Australia, Europe, North America, and South America. He has recently been recognized as a Fellow of the Academy of Europe. For further information on Dr. Buyya, please visit his cyberhome: www.buyya.com

Session Keynote Lecturer I

August 17, Saturday, 13:30-13:55, GMT+8, Beijing Time

ZOOM Link: https://us02web.zoom.us/j/87586988633

Zoom ID: 875 8698 8633

Password: 081618

Prasad Venkatachar

IEEE Senior Member

Pliops, USA

Speech Title: In Pursuit of the World's Best Key-Value Storage Engine

Abstract: We present Pliops (Extreme Data Processor) XDP-Rocks – a RocksDB-compatible key-value storage engine, optimized for SSD storage. XDP-Rocks is a software development kit on top of Pliops XDP– a novel key-value accelerator. It achieves an order-of-magnitude performance improvement over RocksDB in terms of throughput and a two-order-of-magnitude improvement in terms of tail latency. Key-value storage systems have emerged as fundamental components in modern data management architectures, facilitating efficient data storage and retrieval across a wide array of applications. However, the increasing scale and complexity of data-driven environments present significant challenges for the design, implementation, and optimization of these systems. RocksDB and TerakDB, high-performance key-value stores built on the principles of Log-Structured Merge-trees (LSM), is widely used in industry and research for applications requiring efficient data storage and retrieval. Despite their advantages, RocksDB & TerakDB inherit and amplify certain LSM challenges, such as write amplification, read latency, and space utilization, under their extensive and diverse workloads. The applications supported by these storage engines such as Redis on flash, KVRocks, MyRocks and many key value-based applications suffer a significant performance impact due to these limitations. The emergence of several computing avenues from CPUs, GPUs, and TPUs has significantly propelled computing in the cloud, edge computing, deep learning, and IOT however it put a significant onus on the efficiency of storage systems including Key Value Storage. In this paper, we conduct a thorough examination of the key challenges facing key-value storage systems and propose innovative solutions to address them. This paper extends the discussion on the inherent challenges faced by LSM-based systems, specifically focusing on RocksDB, and presents innovative solutions to address these issues.

Bio: Prasad Venkatachar is the Sr Director of Products & Solution at Pliops. He is focused on Solutions and Product strategy and leading and driving Data, Analytics & Storage solutions with partners. He has launched multiple

industry-leading Data & AI/ML products & solutions collaborating with Microsoft, IBM, Oracle, Cloudera, and ISV partners to grow revenue & gain market share at Lenovo & HPE. Prasad Venkatachar is an IEEE Senior Member, BCS Fellow, serving as Google Databases Partner Advisory, Conference Advisory Board for Future of Memory and Storage and served as Lenovo Technology Innovation panel member and Microsoft Data and AI Partner Advisory Member. He also served as a Microsoft Data and AI Partner Advisory Council Member and Member of Lenovo Technology Innovation. Served fortune 500 enterprise customers as SME to deliver business value outcomes for Datacenter and Cloud deployments. He has good experience and certifies with Multiple Cloud (AWS/Azure/GCP/IBM) and Database (Oracle/DB2/Azure Data) and AI/Gen AI certifications from Google, Nvidia, Deep Learning. A regular speaker in Industry Conferences: Microsoft Ignite, Oracle Open World, Gartner Conference, Developer conferences: Pass Summit, Oracle users' group, Percona live and SNIA, SDC, Future of Memory & Storage.

Session Keynote Lecturer II

August 17, Saturday, 13:30-13:55, GMT+8, Beijing Time

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Assoc. Prof. Deshinta Arrova Dewi

Faculty of Data Science and Information Technology

INTI International University, Nilai, Malaysia

Speech Title: SDG 3: Good Health & Well Being SDG Keywords: Public Health

Abstract: Physiotherapy is a medical science that focuses on the treatment and diagnosis of patients who have injuries or other conditions that impede their ability to conduct functional activities.

These therapies usually involve practicing physiotherapy exercises regularly in a controlled setting. Physiotherapy cares for patients by supervising treatment sessions and modifying therapy parameters by providing demonstration, verbal or audio instruction, and physical direction during the physiotherapy activity in a session. Patients are required to complete portions of their therapy sessions at home.

Patients with physical guidance can repeat the targeted exercise while developing their ability to notice and rectify faults. Manual feedback gained during the error detection and repair phase, which are critical phases in motor learning, enhances the success of the rehabilitation process. The biggest barriers to one-on-one sessions between therapists and patients are inherent costs, the distance required to receive in-clinic treatment, therapy accessibility, and availability.

A physiotherapy exercise consists of three basic components: the exercise's stance position, the exercise's motion patterns, and the exercise object. The motion patterns focus on patient movement during the sessions, the exercise's speed, and acceleration in motion.

Stance (start and end position) knowledge is required to examine the patients' posture information during the sessions. The inclusion of the object in the exercise boosts patient confidence and speeds up the therapy process. We

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believe that any automated workout recognition system should explicitly leverage this fundamental domain knowledge for a strong real-world system.

Bio: A highly motivated and enthusiastic educator and researcher with respectable knowledge in the Computer Science field. She has been exposed to the dynamic blended learning environment for Higher Education Learning Institutions for more than 20 years of services in Malaysia and Indonesia to provide the best learning experiences to learners using innovative methods of teaching and learning.

She filed a patent (PI 2018003069) that she worked on together with her final year student in the multimedia field. She has won several awards over the past five years among those are two Silver Awards at the International Inter Varsity Innovation Challenge 2023, a Gold Award at the International Science and Social Science Innovation Competition 2022, 1st Winner at the IEEE Innovation Competition 2022, Sharjah, UAE and Diamond Award (First Winner), Research Innovation & Poster Competition (RIPC), Malaysia in 2021.

Recently she expanded her research by leading a group of researchers to work on an employer project based in London, UK using Generative AI.

Session Keynote Lecturer III

August 17, Saturday, 15:40-16:05, GMT+8, Beijing Time

ZOOM Link: https://us02web.zoom.us/j/89682726455

Zoom ID: 896 8272 6455

Password: 081618

Prof. Paulo Batista

University of Évora, Portugal

Speech Title: Traditional Information Systems Management

Abstract: Following the Second World War an explosion in the quantity of documentation led to a dramatic change in Archiving, or the profession referred to as records managers/records management and archivists/archives. Starting in the 1980s, however, archivists in Quebec began to make great progress by changing their approach and looking at the entire documentary cycle from current to definitive information. Carol Couture and Jean-Yves Rousseau made a crucial contribution towards the understanding of the Three Age Theory that viewed Archiving as an integrated discipline centered on a structural understanding of archives. In 1994, their work Les Fondements de la Discipline Archivistique, presented a new interpretation of Theodore Schellenberg's Three Age Theory. They called attention to the fact that the three phases of archival documents are not separate but, on the contrary, integrated. They argued that these three stages can even be looked at in a segmented way, provided the union between them is ensured. Their great innovation relative to Schellenberg's work lay, precisely, in critiquing the division and separation between the three ages of archival documents. Couture and Rousseau thereby brought together all the phases of the lifecycle of records, from production to dissemination, in opposition to the sterile distinction advocated by traditional archivists and document managers. In my opinion, however, the best approach to integrating information management is known as records continuum, which places archives in a post-custodial, informational, and scientific paradigm. This Australian concept arose in the 1990s amid the huge explosion of information, communication technologies and new media. This context forced Information Science to redefine its object of study. Records continuum is closely related to the integrated management model of Couture and Rousseau, while it carries their innovation further, perfecting it and replacing it with systemic dynamics and providing continuity between archives. In fact, records continuum means, literally, continuous management. It looks at the whole process from the production of records to their final archiving. Otherwise, we cannot speak of continuous management. That is why, when we speak of rigid archives –

current, intermediate, and definitive, this approach is more theoretical than practical. There is, in fact, no separation between these phases, even less so from the point of view of the value of documents. The traditional distinction between information with probative and historical value ceases to exist. The information is simultaneous and is, in fact, the same.

Bio: Paulo Batista is PhD Researcher at CIDEHUS.UÉ-Interdisciplinary Center for History, Cultures and Societies of the University of Évora, Portugal, where is the coordinator of the research group 2: Heritage and Literacies. Currently works as professor at the Iscte-IUL, in the Master in Architecture and Visual Culture in Lisbon, and at the Autonomous University of Lisbon, where is coordinator and professor of the Postgraduate in Promotion and Cultural and Educational Dynamization of Archives and Libraries, and the Postgraduate in Architectural Archives. He has lectured in the Master in Information Science and Documentation at Universidade NOVA de Lisboa (UNL) and has held senior technician positions at the Portuguese Institute of Cultural Heritage, the Portuguese Institute of Architectural Heritage, and the Torre do Tombo Archives. He has also worked as researcher at the Center for the Study of History and Ancient Cartography of the Institute of Tropical Scientific Research. Paulo Batista holds a Ph.D. in Documentation (University of Alcalá, Madrid-UAH), a Master in Information Science and Documentation - Archival Studies (UNL). As part of his doctorate he also received a Diploma of Advanced Studies in Bibliography and Documentation Retrospective in Humanities (UAH), and a Master in Documentation (UAH). He also holds a postgraduate degree in Information Society Law (University of Lisbon) and Information and Documentation Science -Librarianship and Archival Studies (UNL), and a specialization in Good Practices in Patrimonial Management (UNL) and Information Science and Documentation - Archival Studies (UNL). He holds an undergraduate degree in History (University of Lisbon).Paulo Batista is author of a number of books and about 100 papers published in international journals and conference proceedings. He was also keynote speaker and invited speaker at various international conferences (Argentina, Brazil, China, Ecuador, Egypt, England, India, Portugal, South Africa, South Korea, Thailand and Vietnam).Latest published books and coordinated journals: Cities, Architecture and Archives in the Ibero[1]American contexto (with Paulo Tormenta Pinto - Iscte-IUL, Casa da Arquitectura, 2024); D. Manuel I: Cartography of a Reign (with Paula André - Iscte-IUL, Editoral Caleidoscópio, 2023); Bulletin of the Archive of the University of Coimbra - International Architectural Archives (with Paula André - Iscte-IUL, University of Coimbra, 2023); Bulletin of the Archive of the University of Coimbra - Portuguese Architectural Archives (with Paula André - Iscte-IUL, University of Coimbra, 2022); Francisco Keil do Amaral Fund Catalog (Lisbon City Halll/Lisbon Municipal Archives, 2022); Cassiano Look: Photo Contest (with Marta Gomes - AML/CML, Lisbon City Halll/Lisbon Municipal Archives, 2021); Cassiano Branco Fund Catalog (Lisbon City Halll/Lisbon Municipal Archives, 2020).

Day 1- August 16, 2024
Friday, GMT+8, Beijing Time

Online Pretest Session		
Time	**Presenters**	**ZOOM Information**
10:00-17:00	Keynote Speakers, Session Chairs, Committee Members, Session Keynote Lecturers	
10:00-17:00	**Session 1: Data Management and Network Security** MC1013, MC1014, MC1020, MC1056, MC1085, MC1004, MC1047 **Session 2: Information System Management Based on IoT** MC1035, MC1030, MC1055, MC1059, MC1077, MC1018 **Session 3: Text Perception and Interpretable Artificial Intelligence** MC1080, MC1081, MC1079, MC1037, MC1058, MC1064, MC1066 **Session 4: Software Design and Information System Development** MC1033, MC1062, MC1071, MC1048, MC1075, MC1070, MC1009 **Online Session 5: Mobile Application Design and Application** MC1012, MC1074, MC1016, MC1054, MC1001, MC1038, MC1049, MC1008, MC1031 **Online Session 6: Machine Learning and Computation in Image Analysis** MC1003, MC1082, MC1073, MC1027, MC1029, MC1063, MC1044, MC1076	Zoom ID: 875 8698 8633 Zoom Link: https://us02web.zoom.us/j/87586988633 Password: 081618

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✧ Please get your presentation file ready for the pretest.

✧ Please unmute audio and start video while your presentation.

✧ It's suggested to use headset with microphone or earphone with microphone.

Day 2- August 17, 2024
Saturday, GMT+8, Beijing Time

Opening Ceremony, Keynote Speeches

Zoom ID: 87586988633
Zoom Link: https://us02web.zoom.us/j/87586988633
Password: 081618

09:00-09:05	**Welcome Message** Prof. Sergei Gorlatch University of Muenster, Germany
09:05-09:50	**Keynote Speech I** Prof. Chau Lap-Pui Fellow of IEEE Global STEM Scholar (under the Global STEM Professorship Scheme) The Hong Kong Polytechnic University, China *Speech Title: Recent Developments in Vision-based Vehicle Re-identification*
09:50-10:35	**Keynote Speech II** Prof. Chen Changwen Member of Academia Europaea Fellow of IEEE, Fellow of SPIE Chair Professor of Visual Computing The Hong Kong Polytechnic University, China *Speech Title: New Paradigm in Visual Computing: From Algorithms to Systems with New Technical Challenges*
10:35-11:05	**Break Time & Group Photo**
11:05-11:50	**Keynote Speech III** Prof. Rajkumar Buyya Fellow of IEEE Foreign Fellow of Academia Europaea Redmond Barry Distinguished Professor Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory University of Melbourne, Australia *Speech Title: Neoteric Frontiers in Cloud, Edge, and Quantum Computing*
11:50-13:30	**Break Time**

Parallel Sessions

13:30-15:40	ZOOM ID 875 8698 8633 https://us02web.zoom.us/j/87586988633 Password: 081618	**Session 1 -Data Management and Network Security** Session Chair: Gabriel Gomes de Oliveira, UNICAMP and CTI - Renato Archer Research Center, Brazil Session Keynote Lecturer: Prasad Venkatachar, Pliops, United States MC1013, MC1014, MC1020, MC1056, MC1085, MC1004, MC1047
13:30-15:25	ZOOM ID 896 8272 6455 https://us02web.zoom.us/j/89682726455 Password: 081618	**Session 2 –Information System Management Based on IoT** Session Chair: Assoc. Prof. Deshinta Arrova Dewi, INTI International University, Malaysia Session Keynote Lecturer: Deshinta Arrova Dewi, INTI International University, Nilai, Malaysia MC1035, MC1030, MC1055, MC1059, MC1077, MC1018
15:40-15:55	**Break Time & Group Photo**	
15:55-17:40	ZOOM ID 875 8698 8633 https://us02web.zoom.us/j/87586988633 Password: 081618	**Session 3 –Text Perception and Interpretable Artificial Intelligence** Session Chair: Prof. Patrick DELA CORTE Cerna, Mapúa Malayan Colleges Mindanao, Philippines MC1080, MC1081, MC1079, MC1037, MC1058, MC1064, MC1066
15:40-17:50	ZOOM ID 896 8272 6455 https://us02web.zoom.us/j/89682726455 Password: 081618	**Session 4 –Software Design and Information System Development** Session Chair: Prof. Suraiya Jabin, Jamia Millia Islamia, India Session Keynote Lecturer: Prof. Paulo Batista, University of Évora, Portugal MC1033, MC1062, MC1071, MC1048, MC1075, MC1070, MC1009

Day 3 – August 18, 2024
Sunday, GMT+8, Beijing Time

Parallel Sessions		
09:30-11:45	ZOOM ID 875 8698 8633 https://us02web.zoom.us/j/87586988633 Password: 081618	**Session 5 –Mobile Application Design and Application** Session Chair: Assoc. Prof. Rajermani Thinakaran, INTI International University Negeri Sembilan, Malaysia MC1012, MC1074, MC1016, MC1054, MC1001, MC1038, MC1049, MC1008, MC1031
	Break Time & Group Photo	
13:30-15:30	ZOOM ID 875 8698 8633 https://us02web.zoom.us/j/87586988633 Password: 081618	**Session 6 –Machine Learning and Computation in Image Analysis** Session Chair: Dr. Branislav Vuksanovic, University of Portsmouth, UK MC1003, MC1082, MC1073, MC1027, MC1029, MC1063, MC1044, MC1076

Session 1

Time: 13:30-15:40 (GMT+8, Beijing Time) Date: Saturday, August 17 ZOOM ID: 875 8698 8633 Password: 081618 Zoom link: https://us02web.zoom.us/j/87586988633 Topic: Data Management and Network Security Chaired by: Gabriel Gomes de Oliveira, UNICAMP and CTI - Renato Archer Research Center, Brazil	

Session Keynote Lecturer 13:30-13:55	**Title: In Pursuit of the World's Best Key-Value Storage Engine** **Authors:** Prasad Venkatachar, Edward Bortnikov, Michael Pan **Presenter:** Prasad Venkatachar, Pliops, United States **Abstract:** We present Pliops (Extreme Data Processor) XDP-Rocks – a RocksDB-compatible key-value storage engine, optimized for SSD storage. XDP-Rocks is a software development kit on top of Pliops XDP– a novel key-value accelerator. It achieves an order-of-magnitude performance improvement over RocksDB in terms of throughput and a two-order-of-magnitude improvement in terms of tail latency. Key-value storage systems have emerged as fundamental components in modern data management architectures, facilitating efficient data storage and retrieval across a wide array of applications. However, the increasing scale and complexity of data-driven environments present significant challenges for the design, implementation, and optimization of these systems. RocksDB and TerakDB, high-performance key-value stores built on the principles of Log-Structured Merge-trees (LSM), is widely used in industry and research for applications requiring efficient data storage and retrieval. Despite their advantages, RocksDB & TerakDB inherit and amplify certain LSM challenges, such as write amplification, read latency, and space utilization, under their extensive and diverse workloads. The applications supported by these storage engines such as Redis on flash, KVRocks, MyRocks and many key value-based applications suffer a significant performance impact due to these limitations. The emergence of several computing avenues from CPUs, GPUs, and TPUs has significantly propelled computing in the cloud, edge computing, deep learning, and IOT however it put a significant onus on the efficiency of storage systems including Key Value Storage. In this paper, we conduct a thorough examination of the key challenges facing key-value storage systems and propose innovative solutions to address them. This paper extends the discussion on the inherent challenges faced by LSM-based systems, specifically focusing on RocksDB, and presents innovative solutions to address these issues.
MC1013 13:55-14:10	**Title: From Data to Insights: An In-depth Analysis of Standard Data Warehousing and Data Mining Techniques in Various Industries** **Authors:** Mary Jane C. Samonte, Justine Amiel T. Jonson, Roseville Jeanne L. Evangelista, Jerome B. Tamargo **Presenter:** Jerome B. Tamargo, Mapua University, Philippines **Abstract:** This paper comprehensively explores data warehousing and data mining techniques across diverse industries. The study investigates challenges, opportunities, and processes through a systematic methodology. Ethical considerations include copyright, privacy, and conflicts of interest, while technical hurdles involve managing data volume and ensuring integrity. Industries, including smart cities, healthcare, and education, offer avenues for optimized resource utilization and informed decision making. The paper

underscores the significance of responsible data management, technological advancements, and collaborative efforts in harnessing the transformative potential of large-scale data. The research employs this approach to provide insights into the evolving landscape of data-informed decision-making and its beneficial impact on industries and society. After a thorough literature review, this paper presents significant data warehousing and data mining opportunities across various sectors, such as optimizing innovative city processes and transforming healthcare and education decision-making. Embracing emerging technologies and adhering to ethical principles are crucial for harnessing the full potential of data for progress and innovation. It is concluded that collaboration between academia, industry, and regulatory bodies is essential in establishing standardized practices and responsible data usage.

MC1014
14:10-14:25

Title: Elevating Healthcare Efficiency and Patient Engagement: Speech-to-Text Solutions with Multilingual Medical Consultations in the Philippines
Authors: Mary Jane C. Samonte, Allan A. Aspuria, Frances Denielle C. Magno, Mark Joshua B. Vilar
Presenter: Mark Joshua B. Vilar, Mapua University, Philippines

Abstract: This study explores the implementation of speech to-text solutions and multilingual medical consultations in the context of telemedicine in the Philippines. Telemedicine has proven to be an effective means of overcoming geographical and time-related barriers in healthcare delivery. This study addresses these challenges by leveraging a multilingual speech-to-text translator system to enhance healthcare accessibility and patient engagement. This study employs an experimental quantitative research design and an iterative waterfall software methodology. Moreover, it discusses the implementation of cloud-based medical transcription using speech recognition technologies by evaluating the proposed system through functional and non-functional tests. Furthermore, these technologies have the potential to streamline documentation processes, improve information storage and retrieval, and bridge the gap between healthcare providers and patients.

MC1020
14:25-14:40

Title: SHAP-based Interpretable Models for Credit Default Assessment Using Machine Learning
Authors: Qingyang Xu, Yunlong Liao, Qiutong Li, Jiaqi Zhang, Zhilan Song, Linjun Wang, Xiaochen Yuan
Presenter: Qingyang XU, Macao Polytechnic University, Macau, China

Abstract: In recent years, the issue of credit fraud risk has garnered increased attention from the banking and financial sectors. However, prevailing credit assessment models predominantly focus on predictive outcomes, often overlooking the imperative of model interpretability. Understanding the contributions of model features and their interactions is paramount for elucidating model behavior and furnishing vital insights for model enhancement and optimization. To address this gap, this paper proposes a machine learning model leveraging SHAP for explicating credit assessment. Utilizing publicly available datasets from Lending Club, this study validates the proposed model against four industry-standard machine learning approaches: SVM, MLP, XGBoost, and LightGBM. Experimental findings unveil feature importance rankings and elucidate relationships between features and target variables. Notably, the study identifies the predominant roles of loan interest rates and credit policies in credit fraud assessment within the dataset and endeavors to uncover interactions within individual key features. The SHAP framework, as demonstrated, holds promise for informing the design and construction of future credit risk assessment models, thereby bolstering support for financial decision-making and risk management endeavors.

MC1056 14:40-14:55	**Title: Beyond the Firewall: Strategies in Securing Remote Work Environment** **Authors:** Mark Jonathan R. Cuyugan, William P. Rey **Presenter:** William P. Rey, Mapua University, Philippines **Abstract:** The global spread of COVID-19 necessitated a swift transition for businesses towards remote work environments. This rapid digital transformation has significantly expanded the prevalence of remote work arrangements. Central to this shift are the technological vulnerabilities inherent in decentralized IT infrastructures, heightened dependence on personal devices, and inadequate security measures at residential locations. This research presents a structured approach for developing and implementing state-of-the-art cybersecurity solutions through the PPDIOO (Prepare, Plan, Design, Implement, Operate, Optimize) methodology. Key strategies include the deployment of multi-factor authentication (MFA), Zero Trust Network Access (ZTNA), and comprehensive application security measures. Additionally, the study underscores the critical importance of fostering a security-conscious culture among remote employees. The findings highlight the necessity for constant vigilance, stringent enforcement of policies, and ongoing technological advancements to secure data and uphold business continuity amidst the evolving landscape of remote work. For security professionals and enterprises seeking to enhance their cybersecurity frameworks and adapt to the ongoing remote work paradigm, this report provides valuable insights.
MC1085 14:55-15:10	**Title: An API Field Design Method Based on Pre-trained Model** **Authors:** Hai Wang, Yihua Lou, Yi Yang, Ranbin Xu, Jingbo Yang **Presenter:** Jingbo Yang, Beihang University, China **Abstract:** Application programming interface (API) plays an important role in modern software development a well-designed API can provide tremendous convenience for developers. However, designing an excellent API is not a trivial task, each field in the API should avoid any ambiguity. Besides, in some special cases, for instance, a Chinese developer might not accurately translate the meaning of a Chinese API field into its English counterpart. Therefore, there exists a tremendous requirement in designing high quality API field. In this paper, a fine-tuning pre-trained model-based method is proposed for API field design task. Firstly, we consider the design of API fields as a translation task, converting the fields from another language into English. Secondly, we fine-tune a pre-trained model for API field design task. In the end, we curate two datasets to illustrate our method and the experiment results demonstrate that our method has a better performance in designing API field.
MC1004 15:10-15:25	**Title: Digital Footprints Among University Students: Patterns & Privacy Implications** **Authors:** MARK JOSHUA B. VILAR, ALLAN A. ASPURIA, JOSHUA IVAN G. GARCIA, LEILA JOY M. BAUTISTA, LYRA ELIZABETH F. DONATO, ALBERTO VILLALUZ, Grace Lorraine Intal **Presenter:** MARK JOSHUA B. VILAR, Mapua University, PHILIPPINES **Abstract:** This study investigates digital footprints among university students, examining online behavioral patterns and their privacy implications. A digital footprint, often termed a "digital shadow," refers to the distinct data trail an individual leaves on the Internet [2].

	The research employs a quantitative approach and explores online activities, involving 30 university student participants, revealing that 53.3% occasionally share their personal information on social media. Instagram is the most-used platform (86.7%), followed by Facebook (80%). While awareness is high for practices like adjusting privacy settings (73.3%) and creating strong passwords (73.3%), 30% of students report online harassment. Despite 90% acknowledging security risks, there is room for improvement in behaviors, with lower percentages for regular privacy settings updates (16.7%) and content curation (70%). In conclusion, reinforcing online safety requires emphasizing risk awareness and consistent security measures, including regular updates to privacy settings and thorough content curation. Additionally, institutions and educators play a crucial role in promoting responsible online navigation by integrating comprehensive digital literacy programs that empower students with the necessary knowledge and skills.
MC1047 15:25-15:40	**Title: Historya: 3D Game That Teaches Historical Event in The Philippines** **Authors:** JOEL DE GOMA, CRISTINA PASCUA, ADRIAN RAMIREZ, Kyle Steven Docuyanan **Presenter:** CRISTINA PASCUA, Mapua University, Philippines **Abstract:** History is an important part of our lives because it helps us understand what happened to our society and civilization before we were born. This matter of importance has resulted in the creation of Historya, an interactive history first-person shooter game that will allow players to learn about the Bataan Death March. The game will include informational facts or learnings that players can check on during their experience. The researchers created the questionnaire based on the game's quality and the sufficient amount of information for the player to learn something from the game. The Survey questionnaire is then given to respondents who are interested in shooter games and history. After analyzing the data gathered, the researchers have concluded that users can learn something from a game that has themes of history and gives them the experience of the events that happened in the past.

Session 2

Time: 13:30-15:25 (GMT+8, Beijing Time)
Date: Saturday, August 17
ZOOM ID: 896 8272 6455
Password: 081618
Zoom Link: https://us02web.zoom.us/j/89682726455
Topic: Information System Management Based on IoT
Chaired by: Assoc. Prof. Deshinta Arrova Dewi, INTI International University, Malaysia

Session Keynote Lecturer 13:30-13:55	**Title: The Intelligence Drug Discovery** **Authors:** Deshinta Arrova Dewi, INTI International University, Nilai, Malaysia **Presenter:** Deshinta Arrova Dewi, INTI International University, Nilai, Malaysia **Abstract:** Physiotherapy is a medical science that focuses on the treatment and diagnosis of patients who have injuries or other conditions that impede their ability to conduct functional activities. These therapies usually involve practicing physiotherapy exercises regularly in a controlled setting. Physiotherapy cares for patients by supervising treatment sessions and modifying therapy parameters by providing demonstration, verbal or audio instruction, and physical direction during the physiotherapy activity in a session. Patients are required to complete portions of their therapy sessions at home. Patients with physical guidance can repeat the targeted exercise while developing their ability to notice and rectify faults. Manual feedback gained during the error detection and repair phase, which are critical phases in motor learning, enhances the success of the rehabilitation process. The biggest barriers to one-on-one sessions between therapists and patients are inherent costs, the distance required to receive in-clinic treatment, therapy accessibility, and availability. A physiotherapy exercise consists of three basic components: the exercise's stance position, the exercise's motion patterns, and the exercise object. The motion patterns focus on patient movement during the sessions, the exercise's speed, and acceleration in motion. Stance (start and end position) knowledge is required to examine the patients' posture information during the sessions. The inclusion of the object in the exercise boosts patient confidence and speeds up the therapy process. We believe that any automated workout recognition system should explicitly leverage this fundamental domain knowledge for a strong real-world system.
MC1035 13:55-14:10	**Title: FARMERICE SYSTEM DESIGN: EMPOWERING LOCAL FARMERS AND HOMEGROWN RICE IN THE MARKET** **Authors:** Eric Blancaflor, Darwin Diego Dellosa **Presenter:** Eric Blancaflor, Mapua University, Philippines **Abstract:** This study presents the Farmerice system, a comprehensive platform designed to address the challenges faced by the local farmer in the Philippine rice market today. The purpose of this paper is to help the farmers and get to sale the different variety of rice in profitable way. The system empowers consumers by providing detailed information on rice varieties, harvesting schedules, quality metrics, and the specific fertilizers used during cultivation. This transparency enhances consumer decision-making and supports local farmers in promoting their products at competitive prices, ensuring they remain competitive in the line of imported products. In the current business world today, when internet of things (IoT) is applied everywhere, we also unified and embrace the modernization and advancement of technology in our everyday lives. Despite of being advance in mechanism

in enterprise and economy there are so many places in our nation that are left behind in terms of technology. One of those is small farmers in different community that cannot cope up to the speed of the economic progress. Philippine local farmers encounter challenges in rice marketing. Imported products flood the market, posing a threat to the livelihoods of local farmers who struggle to differentiate their products and command fair prices. The lack of transparency regarding varieties, cultivation practices, and quality standard funder hinders local farmers from effectively positioning their produce in the market. By analyzing literature to identify the most essential factor in the developing the solution, the researcher understands the market strength, weakness, opportunities, and threats may occur during the transaction process. The Farmerice system aims to address these challenges by providing consumers with detailed and real-time information about home grown produced of rice. By offering insights into rice varieties, days of harvesting, rice quality, and even the specific fertilizers used, the platform enables consumers to make informed choices that prioritize locally grown rice. This is not only creating more visible and accountable rice market but also contributes to the preservation of local farming traditions and the economic sustainability of farming communities. This ecommerce solutions outline how the Farmerice system can empower local farmers to overcome marketing hurdles and enhance their competitive advantage. The project empathizes the importance of ensuring that local framers are not left behind in the market, promoting a fair and equitable agricultural ecosystem that support the growth of the Philippine rice industry.

MC1030

14:10-14:25

Title: Secure Healthcare Access: Design and Implementation of a Web Application through Role-Based Access Control in an Integrated Diagnostic Health Center

Authors: Mary Jane C. Samonte, Clarisse Q. Dalina, Yuri Emyrald M. Pingol, and Ferdinand Nino Migel E. Yee

Presenter: Yuri Emyrald M. Pingol, Mapua University, Philippines

Abstract: This study addresses the complexities of implementing Role-Based Access Control (RBAC) in an Integrated Diagnostic Center Website, crucial for safeguarding sensitive patient data and maintaining confidentiality in healthcare. The research identifies a critical gap in communication and implementation strategies for RBAC in healthcare settings, emphasizing the necessity for tailored approaches to improve user understanding and acceptance. The paper explores problems, complexities, and optimization strategies associated with RBAC adoption, offering insights for practitioners, policymakers, and scholars. Key elements including resource allocation, communication methods, and role model design are thoroughly examined to ensure effective RBAC integration. Challenges such as resource restrictions and communication gaps are identified, and actionable insights and solutions are proposed to mitigate risks and facilitate implementation procedures. Optimization measures like proactive resource allocation and personalized communication are recommended to enhance RBAC efficacy within the integrated diagnostic center website architecture. The discussion centers on hierarchical RBAC models, which streamline access control by aligning privileges with organizational hierarchies and responsibilities, thereby bolstering security and operational efficiency. Overall, this research provides a comprehensive roadmap for successful RBAC deployment in healthcare, aiming to fill the identified research gap and improve security measures in a digitally evolving healthcare sector.

MC1055 14:25-14:40	**Title: Severum Sphere: A Smart Management System for Severum Cichlid Habitats Using IoT Technology** **Author:** William P. Rey **Presenter:** William P. Rey, Mapua University, Philippines **Abstract:** The development and evaluation of Severum Sphere, a cutting-edge device intended to transform the handling and maintenance of Severum cichlids completely, is presented in this paper. Severum Sphere simplifies aquarium maintenance by utilizing sensor-actuator technology and an intuitive smartphone interface. This enables enthusiasts to monitor and control important parameters remotely. Based on a thorough user assessment, the method shows great acceptability and efficacy in improving Severum care. The effective use of IoT technology, the effectiveness of the mobile interface for remote management, and the strong anomaly detection powers made possible by machine learning algorithms are highlighted by key findings. These findings provide important insights into user preferences and usability issues while also advancing the field of smart aquarium technology. Severum Sphere could lead to more cooperation and innovation in the field of ornamental fishkeeping in the future, which would benefit aquatic lovers all over the world by advancing the creation of environmentally benign and sustainable solutions.
MC1059 14:40-14:55	**Title: Assessment of Using Artificial Intelligence Navigational Applications in Metro Manila** **Authors:** Mary Jane C. Samonte, Raymond B. Sedilla, Edrick Joseph D. Concepcion, Glenmar P. Otilla, Aisaac Job M. Lim, Rojelio C. Velarde **Presenter:** Raymond B. Sedilla, Mapua University, Philippines **Abstract:** Navigation systems are frequently used by people and are a basis for routes, transportation, and logistics. Many users of GPS applications often encounter problems when using these systems due to incorrect data being received. The study investigated the issues users face regarding their use of GPS applications and the lack of features that need to be improved or included. The study utilized the data gathered in the survey to understand underlying themes and problems encountered by respondents, and it shows that the integration of AI with navigation systems will benefit users. The survey also discovered that most respondents have a high level of complete agreement on integrating AI into navigational applications. The research explores integrating real-time data from CCTV cameras across Metro Manila into AI-powered GPS navigation apps. By collecting data from CCTVs, the study aims to advance the accuracy and capability of GPS navigation and devising routes in Metro Manila. By understanding individual behavior and preferences, AI algorithms can provide tailored suggestions for nearby points of interest and route preferences. The level of personalization greatly enhances the user experience gives a broader perspective on navigation throughout Metro Manila and improves engagement with AI-integrated GPS tracking applications.
MC1077 14:55-15:10	**Title: HydroSentry: IoT-Based River Water Level Monitoring and Forecasting with Advanced Dual Layer Neural Networks** **Authors:** Jhon Lloyd Dayuno, Luis Angelo Fruto, Janrev Lance Villadores, Rhodessa J. Cascaro, Patrick D. Cerna **Presenter:** Patrick DELA CORTE Cerna, Map , Philippines

Abstract: The Philippines is an archipelago nation particularly vulnerable to natural disasters. According to the Flood Hazard Maps provided by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA), several river basins are highly vulnerable to flooding [1]. To address this pressing issue, this paper proposes the development of an IoT and web-based water level monitoring and forecasting system. The forecasting model utilizes a 128-neuron ReLU-activated dense layer for feature extraction followed by a single-neuron linear layer for final prediction. The Adam optimization algorithm ensures efficient model training. This system aims to empower these flood-prone communities by providing them with real-time data and proactive flood predictions. In preparing for model development, researchers sourced external data from international rivers via Kaggle, covering hourly intervals over a span of 33 years. From this extensive dataset, researchers extracted recent data from January to February 20, amounting to 744 hourly data points. Overall, Training and testing RMSEs for the dual-layer forecasting model were 2.73 and 3.54, respectively. This suggests that there is still a low average prediction error. The average of the squares of the errors is measured by the Mean Square Error (MSE), which gives an idea of how far off the predictions are overall from the real values. Since this metric squares the differences before averaging, it is especially sensitive to larger errors.

MC1018
15:10-15:25

Title: IoT-Based Fertilizer Recommendation System for Smart Agriculture

Authors: Priya. S, T.Sasilatha, A.Suresh, Sridevi. V, M. Batumalay, D.A.Dewi

Presenter: Malathy Batumalay, INTI International University, Malaysia

Abstract: Agriculture is the key engine driving economic growth in our country. These days, smart agriculture is surpassing traditional agriculture in terms of farming productivity. Rapid technological developments in food production are necessary due to the world's growing food demand, but smallholder farmers lack the financial resources to purchase expensive monitoring equipment. We developed an Arduino-based GSM-enabled crop monitoring system to solve these issues. Our primary objective in this project is to maintain, control, or monitor agricultural trends or systems that provide frequent user access to data about the region. One person is frequently insufficient to monitor affairs and keep things under control. If we're going to advance, we need to focus on the agriculture monitoring system and collect more field data. Ambient temperature, moisture content, pH level, and moisture content of the soil will all be monitored by the suggested system and apparatus. To reduce reliance on rainfall, a variety of irrigation techniques are used today. Here, an agricultural monitoring system has been established using sensors such as temperature and moisture sensors. Essentially, the purpose of temperature sensors is to track temperature, whereas soil moisture sensors are used to measure soil moisture content. Using a GSM SIM 900, data is transmitted to the closest agriculture officer. When choosing the proper fertilizer, the farmer may receive guidance from officials.

Session 3

MC1080 15:55-16:10	**Title: INT: Integrating Neighborhood and Textual Information for Knowledge Graph Entity Typing** **Authors:** Qihang Zhang, Hongbin Zhang, Chong Chen, Weiwen Zhang, Lianglun Cheng **Presenter:** Qihang Zhang, Guangdong University of Technology, China **Abstract:** Knowledge Graph Entity Typing (KGET) aims to infer missing types of entities in knowledge graphs, which plays an essential role for various downstream tasks. Existing methods for KGET model type instances, but overlook the information hidden in entity texts. In this paper, we propose a model called INT, which Integrates entity Neighborhood information and Textual type features. Specifically, the model takes into account complex relations and focuses on the interaction information among them. It is achieved by independently considering relation neighbors and type neighbors to infer missing entity types. Meanwhile, we extract type-specific information from entity text to strengthen the semantic representation of entity, further improving the performance of complex and fine-grained entity type prediction. We conduct extensive experiments on two public datasets, i.e., FB15kET and YAGO43kET. Experimental results demonstrate that our proposed model can outperform other methods. In addition, we verify the effectiveness and necessity of each module in the proposed model.
MC1081 16:10-16:25	**Title: Fine-tuning Urdu NER Models Using Context-Aware Embeddings** **Authors:** Nikhar Azhar, Seemab Latif, Sahar Arshad **Presenter:** Nikhar Azhar, National University of Sciences and Technology (NUST), Pakistan **Abstract:** Many applications rely on Named Entity Recognition (NER) to accurately identify and extract key pieces of information from large amounts of text. For applications that deal with high-risk and sensitive data, having a reliable and efficient model becomes crucial. While there have been many advancements for NER in the English language, low-resource languages like Urdu are still lagging behind. In this research, we have focused on Urdu text NER. We used the MK-PUCIT corpus, which is currently the largest labeled dataset available for Urdu NER. We fine-tuned two transformer models, Urduhack's "roberta-urdu-small" and Google's "muril-based-cased", and achieved F1-scores of 0.942 and 0.941 respectively. However, through analyzing the results of our fine-tuning, we found many mislabeling errors in the MK-PUCIT corpus. These errors include incorrect tagging of names as locations and punctuation marks as entities. Despite these issues, our study shows the potential for enhancing Urdu NER by addressing these errors and improving the quality of the dataset.

MC1079 16:25-16:40	**Title: Leveraging Contextual Interaction and Semantic Knowledge for Multi-hop Question Answering** **Authors:** Peifeng Jia, Weiwen Zhang **Presenter:** Peifeng Jia, Guangdong University of Technology, China **Abstract:** Knowledge Graph Question Answering (KGQA) is a fundamental task in Knowledge Graph (KG). Existing works of KGQA deduce path information from the neighborhood of the subgraph and obtain the answer to the question. However, the global semantic information may not be obtained for sparse KG. In addition, the interaction between question and the knowledge base is ignored. In this paper, we propose a model called Contex- tual Interaction and Semantic Knowledge (CISK) for multi-hop question answering. We leverage the attention mechanism to fuse contextual information to enhance the question. Additionally, we use knowledge graph embedding (KGE) to ensure the integrity of the KG. Compared to the baseline (EmbedKGQA), our model achieves 0.7% and 2.0% accuracy improvements on 2- hop questions for MetaQA full and MetaQA half datasets, 0.3% and 1.6% on 3-hop questions, respectively, and 3.8% accuracy improvements on WebQSP full and 0.9% on WebQSP half, respectively.
MC1037 16:40-16:55	**Title: Design Analysis in Improving Customer Relations Using Conversational Artificial Intelligence** **Authors:** Mary Jane C. Samonte, Ermelie C. Lising **Presenter:** Ermelie C. Lising, Mapua University, Philippines **Abstract:** A chatbot is equally vital if its purpose and objective are known. Chatbots are commonly used in marketing, sales, and customer service. Artificial Intelligence has been with us since the first half of the twentieth century. Due to hardware limitations at that time, computers could not execute and store commands. Because of the fast pace of technology, both storing and executing flourished, and so came the birth of artificial intelligence. This study aims to explore how artificial intelligence affects customer relations by discussing different kinds of chatbots. It briefly outlines how integrating chatbots or conversational AI significantly affects how customers behave in the retail business. Incorporating human characteristics into conversational agents drives the design of generative AI chatbots. Studies indicate that more work has to be done to improve chatbot performance. Improvements include reducing the chatbot's usage of cliches and enabling users to approach conversations sincerely. Studies indicate that more work has to be done to improve chatbot performance. Circling back to the anthropomorphism theory, trust in chatbots and chatbot overload further significantly impact service evaluation and customer purchase.
MC1058 16:55-17:10	**Title: Interpretability in Financial Forecasting: The Role of eXplainable AI in Stock Market** **Authors:** Hira Tanveer, Sahar Arshad, Huma Ameer, Seemab Latif **Presenter:** Hira Tanveer, National University of Sciences and Technology, Pakistan **Abstract:** The financial services sector, particularly asset management companies, is subject to stringent regulations, with investment decisions undergoing continuous scrutiny by committees. While Artificial Intelligence (AI) has the potential to revolutionize financial services, its adoption in complex market analysis is hindered by its black-box

	nature. This paper addresses the challenge of time series forecasting for predicting market stability, leveraging comprehensive data from the Pakistan Stock Exchange. We conducted an experimental comparative study to classify time series data and to enhance model interpretability. We proposed an Explainable AI (XAI) framework using post-hoc techniques such as Local Interpretable Model-agnostic Explanations (LIME) and SHapley Additive exPlanations (SHAP). Our Conv1D-BiLSTM architecture achieved an accuracy of 83%. LIME interpretations revealed that moving averages were the most significant contributors to the predictions. The proposed framework provides key feature contributions, making model decisions transparent and interpretable for stock market participants.
MC1064 17:10-17:25	**Title: Advancing Systems Integration and Administration: Harnessing Artificial Intelligence for Enhanced Security** **Authors:** Mary Jane C. Samonte, Ma. Lhealynn N. Daquioag-Vasquez, Lex Anilov T. Ogaya **Presenter:** Lex Anilov Ogaya, Mapua University, Philippines **Abstract:** This paper explores the pivotal role of Systems Integration and Administration in AI/Security, emphasizing their importance amidst rapid technological advancements. Traditional cybersecurity measures are increasingly inadequate against evolving threats, necessitating the integration of AI-driven solutions. While maneuvering through the complexity of today's systems, a clear trend of more effective integration and good administration become even more prominent as the years go by. Through the careful exploitation of the processes and the analysis, the specialists draw attention to the great complementarity of Systems Integration and Administration to technological breakthroughs. Systems integration helps organizations to turn the fragmented processes into a systematic approach for more effective use of resources and to foster innovation. Through a comprehensive literature review, this study elucidates the critical role of Systems Integration and Administration in facilitating the seamless operation of complex systems, particularly when augmented by AI technologies such as machine learning and deep learning. The integration of AI enhances security measures, enabling organizations to detect and mitigate threats in real-time. The convergence of Systems Integration, Administration, Artificial Intelligence, and Security offers transformative potential, bolstering defenses against cyber threats while fostering innovation and efficiency. Through interdisciplinary collaboration, organizations can harness the power of AI to navigate the evolving threat landscape with confidence, contributing to a more secure and resilient future.
MC1066 17:25-17:40	**Title: Artificial Intelligence Integration and Administration into Pharmaceutical Manufacturing Execution Systems: Assessing Potentials and Challenges for Process Optimization** **Authors:** Mary Jane C. Samonte, Herzon B. Chu, Lex Anilov T. Ogaya **Presenter:** Herzon Chu, Mapua University, Philippines **Abstract:** This study investigates the benefits and challenges of integrating Artificial Intelligence (AI) technologies into the Manufacturing Execution System (MES), specifically in the pharmaceutical industry. The main objective of this paper is to use various AI methodologies, such as machine and deep learning, to refine manufacturing processes and assess their effectiveness. Moreover, the study suggests that AI has the

	potential to improve process efficiency, reduce costs, and enhance decision-making processes. However, successful implementation requires addressing challenges such as data integration, algorithm selection, and workforce upskilling. In essence, this research underscores the imperative for a comprehensive and nuanced approach to AI integration into MES within the pharmaceutical domain. By acknowledging both the opportunities and challenges this integration presents, organizations can lay the groundwork for a future where AI-driven manufacturing optimization becomes synonymous with industry success and innovation. Thus, understanding these complexities is crucial, and this research provides valuable insights for manufacturers and researchers alike.

Session 4

Time: 15:40-18:05 (GMT+8, Beijing Time)
Date: Saturday, August 17
ZOOM ID: 896 8272 6455
Password: 081618
Zoom Link: https://us02web.zoom.us/j/89682726455
Topic: Software Design and Information System Development
Chaired by: Prof. Suraiya Jabin, Jamia Millia Islamia, India

Session Keynote Lecturer 15:40-16:05	**Title: Traditional Information Systems Management** **Author:** Paulo Batista, University of Évora, Portugal **Presenter:** Paulo Batista, University of Évora, Portugal **Abstract:** Following the Second World War an explosion in the quantity of documentation led to a dramatic change in Archiving, or the profession referred to as records managers/records management and archivists/archives. Starting in the 1980s, however, archivists in Quebec began to make great progress by changing their approach and looking at the entire documentary cycle from current to definitive information. Carol Couture and Jean-Yves Rousseau made a crucial contribution towards the understanding of the Three Age Theory that viewed Archiving as an integrated discipline centered on a structural understanding of archives. In 1994, their work Les Fondements de la Discipline Archivistique, presented a new interpretation of Theodore Schellenberg's Three Age Theory. They called attention to the fact that the three phases of archival documents are not separate but, on the contrary, integrated. They argued that these three stages can even be looked at in a segmented way, provided the union between them is ensured. Their great innovation relative to Schellenberg's work lay, precisely, in critiquing the division and separation between the three ages of archival documents. Couture and Rousseau thereby brought together all the phases of the lifecycle of records, from production to dissemination, in opposition to the sterile distinction advocated by traditional archivists and document managers. In my opinion, however, the best approach to integrating information management is known as records continuum, which places archives in a post-custodial, informational, and scientific paradigm. This Australian concept arose in the 1990s amid the huge explosion of information, communication technologies and new media. This context forced Information Science to redefine its object of study. Records continuum is closely related to the integrated management model of Couture and Rousseau, while it carries their innovation further, perfecting it and replacing it with systemic dynamics and providing continuity between archives. In fact, records continuum means, literally, continuous management. It looks at the whole process from the production of records to their final archiving. Otherwise, we cannot speak of continuous management. That is why, when we speak of rigid archives – current, intermediate, and definitive, this approach is more theoretical than practical. There is, in fact, no separation between these phases, even less so from the point of view of the value of documents. The traditional distinction between information with probative and historical value ceases to exist. The information is simultaneous and is, in fact, the same.
MC1033 16:05-16:20	**Title: An In-Depth Analysis on Systems Integration and Architectural Design and Implementation on Security** **Authors:** Mary Jane C. Samonte, Mark Gabriel E. Artista and Derrick E. Javier **Presenter:** Mark Gabriel E. Artista, Mapua University, Philippines

Abstract: Systems integration and architecture are two of the backbones of today's interconnected society, dealing with the inner workings of digital gears that make our world go round. The field plays a pivotal role in the modern technological landscape and, as such, makes the task of ensuring it keeps playing is crucial. Currently, keeping robust security measures within integrated systems remains a challenge. Through a systematic review of relevant literature, this meta-analysis will comb through findings from a range of studies to evaluate the effectiveness of the various present strategies, frameworks, and technologies in achieving secure systems integration and architecture. This analysis considers the factors of implementation methodologies, security protocols, organizational contexts, and technological advancements in the framing for the evaluations. The key insights from the meta-analysis aim to offer valuable implications for practitioners, policymakers, and researchers alike in enhancing the security posture of integrated systems and architectural design of today and securing its effectiveness for the future.

MC1062

16:20-16:35

Title: SFTCS: Multiform Sematic Fusion Based on Transformer for Code Summarization

Authors: Jun Yang, Longhao Ao, Rongzhi Qi

Presenter: Jun Yang, Hohai University, China

Abstract: Automatic code summarization aims to create coherent natural language descriptions for code snippets. Recent studies indicate that integrating additional code representation structures improve the quality of generated summaries beyond token sequence-based approaches. Current technical research mainly concentrates on the graph structure information of code snippets. However, using a graph method makes it challenging to extract meaningful semantic information from the code snippets. To address the issue, we investigate how to learn more about code semantics and information from the perspective of code text feature representation. Consequently, we propose a novel model named SFTCS. SFTCS employs a conjoint feature fusion strategy, focusing on two types of information in code snippets: code token sequence features and FGT features based on Abstract Syntax Trees (AST) sequence and graph sequence. An N-adjacency matrix based on AST features is constructed, and the corresponding feature for AST block are optimized through a graph-based structure. Subsequently, a FGC decoder processes the two types of features. With the aid of an attention mechanism for feature enhancement, the SFTCS model ultimately predicts the results concretely. Evaluations on two publicly available Java datasets validate the effectiveness of SFTCS, showing its superiority over six advanced code summarization models. Ablation studies further elucidate the contributions of each component within the SFTCS model.

MC1071

16:35-16:50

Title: A Method to Detect Vulnerability of Java Source Code based on AST and Graph Attention Networks

Authors: Jin Zhu, Hui Ge, Xiao Jin, Rui Luo

Presenter: Jin Zhu, China Aerospace Academy of Systems Science and Engineering, China

Abstract: It is crucial to Detecting vulnerabilities in source code at the beginning of projects. Traditional source code vulnerability detection algorithms are hard to represent the feature information and the relationships between code blocks. To address these issues, this paper uses abstract syntax tree to represent the feature of source code. This paper adds data dependency edges and control dependency edges to the original AST, transforming the tree-structured AST into a graph-structured Enhanced-AST in order to solve the limited ability

	of the original AST to represent data flow and control flow. Word2Vec algorithm is used for embedding Enhanced-AST nodes, and Graph Attention Networks (GAT), which introduces an attention mechanism to better capture the dependencies and important information between nodes, are used to learn the feature information of Enhanced-AST. This paper collects Java CWE vulnerability datasets from the SARD dataset, implements a function-level vulnerability detection method based on the dataset, and compares it with BiLSTM and method using AST to extract code features. Experimental results show that the proposed method achieves optimal F1 values in most cases.
MC1048 16:50-17:05	**Title: SuSci: Using Interactive Games to Help Mental Recollection** **Authors:** JOEL DE GOMA, CRISTINA PASCUA, Ethan Enrico Eseo, John Aston Martin De Guzman, Christine Anne Arches **Presenter:** CRISTINA PASCUA, Mapua University, Philippines **Abstract:** Forgetting information is a natural problem that all of us encounter to a certain degree. As such, experts and professionals thought of various practices and strategies that helped people recall information. People who forget certain valuable and useful information when they need to is detrimental to one's personal growth especially to students and their academics. Research showed that cognitivism is one of the many effective strategies used to help people recall information albeit the same learning theory applied in interactive video games has not been established yet. The project discussed the use of interactive video games as a method to assist students regarding information recall. Through the use of an original 2D point-and-click escape room interactive game, a survey questionnaire is distributed to students above the Grade 6 level and the collected data were analyzed to determine whether interactive games help the students' mental recollection. As a result, the study concluded that interactive games are in fact effective in promoting information recall with regards to students above the Grade 6 level.
MC1075 17:05-17:20	**Title: Implementing ISO 27001 Security Measures in Educational Open-Source ERP Systems** **Authors:** Saima Bibi, Farooque Azam, Muhammad Waseem Anwar **Presenter:** Saima Bibi, National University of Sciences and Technology (NUST), Pakistan **Abstract:** This paper explores the applicability of security standards ISO 27001 to Open-source Enterprise Resource Planning (ERP) software for educational institutes. The gap in existing security measures, particularly in the implementation of ISO 27001 concerning data privacy, integrity and availability, are identified for Odoo ERP system that aims to establish a benchmark for similar systems for ensuring data privacy, integrity, and availability. Mixed-methods approach proposed in this paper integrates expert analysis and quantitative survey methodology for effective compliance with ISO 27001 controls for the EPR system of educational institutes. The findings of this paper contribute to enhancing security measures for ERP systems in educational institutes by applying ISO 27001 standards. The expert analysis provides the standardization of industrial best practices for ERP system and current state of security measures are evaluated using quantitative surveys for educational ERP systems.

MC1070 17:20-17:35	**Title: Cloud-Native E-commerce Solutions: Evaluating the Cost-Effectiveness of Cloud Platforms for Hosting and Scaling E-commerce Applications** **Authors:** Mary Jane Samonte, James Marius De Luna, FItzpatrick Alberca, Alessandra Leonina Eco, Joel De Goma **Presenter:** James Marius De Luna, Mapua University, Philippines **Abstract:** This paper delves into the critical role of cloud-native e-commerce solutions in the contemporary digital landscape, emphasizing the secure and efficient hosting and scaling of applications. Through a comprehensive evaluation, the study assesses the performance, cost-effectiveness, and security aspects of various cloud platforms tailored for e-commerce. The findings underscore the transformative impact of cloud-native architectures in enhancing operational efficiency, optimizing customer experiences, and boosting competitiveness in the digital marketplace. Key insights reveal that security risks, performance benchmarking, and cost analysis are pivotal in shaping the strategic adoption of cloud-native solutions. Implementing robust security measures is crucial to mitigate vulnerabilities and ensure data integrity. Additionally, tailored performance evaluations help identify the most suitable cloud configurations, while strategic cost optimization strategies contribute to sustainable business operations. The study also explores the integration of edge computing and hybrid cloud setups, highlighting their potential to enhance energy efficiency, achieve significant cost savings, and improve operational resilience. These advancements allow businesses to adapt to fluctuating demands and maintain continuity in service delivery. Looking forward, the future of cloud-native e-commerce solutions lies in strategically integrating emerging technologies such as AI and IoT, establishing robust security frameworks, and adopting agile operational practices. These elements drive business growth, foster innovation, and maintain a competitive edge in the rapidly evolving digital economy.
MC1009 17:35-17:50	**Title: Defining Metrics for Evaluating Transparency in Software Engineering Process** **Authors:** Paulinus Ofem, Bassey Isong, Francis Lugayizi **Presenter:** Paulinus Ofem, North-West University, South Africa **Abstract:** Transparency has become an important nonfunctional quality requirement of software products and processes. In software engineering, stakeholders, especially software developers and requirements engineers, do not fully know how to benefit from transparency because of the lack of suitable measures and metrics that can be utilised in transparency evaluation and its improvement. Few existing metrics are also poorly defined and, therefore, poorly understood. This paper proposes measures and metrics for evaluating and improving transparency. By integrating the "define-your-own-model," the Goal Question Metric and the model-driven engineering paradigms, we provide a comprehensive set of transparency quality measures and metrics that can be used in a transparency improvement programme.

Session 5

MC1012 9:30-9:45	**Title: A Design Analysis of A Web-Based 2D Virtual Laboratory Application for Phlebotomy Learning** **Author:** Mary Jane C. Samonte, Joshua Kyle C. Bondoc, Friah Maxine P. Chua, Andrea May M. Pineda **Presenter:** Joshua Kyle C. Bondoc, Mapua University, Philippines **Abstract:** Digital transformation has changed the education sector, switching from traditional learning methods to a flexible digital setup through the use of e-learning. In line with this, the primary goal of this study is to determine the prior knowledge of 1st-year medical technology students regarding the concepts of phlebotomy and also to administer a pre-test to find the lessons that need more reinforcement for the proposed web application. The pre-test contained 15 questions from the six foundational phlebotomy lessons. Initial results have shown that students have prior knowledge regarding phlebotomy, and the results of the pre-test assessment show an average score of 9 out of 15. Moreover, the lessons Introduction to Phlebotomy and Anatomy and Physiology of the Circulatory System need more supplemental learning support in the proposed e-learning web application as students only scored 56.67% and 23.33% of correct answers, respectively, the lowest out of all. Based on the initial findings, the proposed system for this study is an innovative web-based platform that aims to transform phlebotomy education in order to provide immersive learning experiences for medical technology students.
MC1074 9:45-10:00	**Title: PERFORMANCE COMPARISON OF SINGLE CODE BASE DEVELOPMENT TOOLS: FLUTTER, REACT NATIVE, AND XAMARIN** **Authors:** Faran Mushtaq, Farooque Azam, Muhammad Waseem Anwar **Presenter:** Faran Mushtaq, National University of Sciences and Technology (NUST), Islamabad, Pakistan **Abstract:** The efficacy of cross-platform frameworks for An- droid devices has become a concern as more and more companies shift towards them. This paper examines the comparative performance dynamics of the Android application development life-cycle of three leading frameworks: Flutter, React Native, and Xamarin. These frameworks provide write-once, run-anywhere capabilities that aim to streamline development processes while promising to ensure performance and user experience at par with the native applications. Through an empirical approach (using tools such as Android Studio's Profiler and Perfetto), this study develops a standard benchmarking application to measure critical performance/ quantifiable metrics across these frameworks. Experimental results have shown that Flutter offers the best performance due to its direct compilation of native code on Android. On the other hand, React Native has a very low learning curve being dependent on JavaScript which is a famous language among web developers and Xamarin has the most easy setup process because it can be installed as a module on Visual Studio Community. Both

	subjective (user-dependent) and objective approaches offer valuable insights for developers to select a framework that can align with the organizational expertise and project needs.
MC1016 10:00-10:15	**Title: HogCare: A Web-based Pig Farming Learning Application Hog Growing Management** **Authors:** Mary Jane C. Samonte, Hans Christian D. Deniega, Archie Brendan B. Mangubat, Alfred Bien R. Rodriguez **Presenter:** Hans Christian D. Deniega, Mapua University, Philippines **Abstract:** Web-based applications are now essential tools for work productivity and service access. Agriculture employs a large percentage of the workforce in the Philippines, with the swine industry being particularly important. In spite of this, a lot of hog farmers still employ older methods. The purpose of this study aimed to create a web application designed specifically to assist hog farmers with the goal to reduce their daily workload and improve operational effectiveness. The Post-Study System Usability Questionnaire (PSSUQ), the System Usability Scale (SUS), and ISO 9126 standards were utilized to assess the Hog Growing Management application. This provided a thorough examination of both user acceptability and usability. Positive feedback and great user satisfaction were observed in the results. In conclusion, by modernizing pig-rearing techniques and streamlining day-to-day farm management, this program increases the productivity and efficiency of hog farmers, reducing manual labor and increasing profitability. These outcomes in this study demonstrate how technology has the potential to incorporate technology in conventional farming methods, developing an improved and sustainable agricultural industry.
MC1054 10:15-10:30	**Title: Boosting Mobile Performance: An In-Depth Guide to X-Mech Optimization** **Authors:** William P. Rey, Alberto C. Villaluz **Presenter:** Willam P. Rey, Mapua University, Philippines **Abstract:** In the dynamic realm of on-demand service platforms, "X-Mech" stands as a pivotal player, facilitating seamless connections between service providers and consumers while reshaping transactional experiences. This study delves into the intricacies of the mobile user experience within X-Mech, focusing on challenges like slow loading times and unresponsive interfaces. The core objective is to optimize the performance of X-Mech's mobile application using a structured approach. The study commences with a comprehensive pre-optimization assessment, analyzing baseline metrics and identifying performance bottlenecks. Subsequently, targeted optimization strategies are deployed, addressing issues such as client-side workloads, render-blocking resources, and JavaScript optimization. Post-optimization evaluation entails rigorous testing of web vitals, consolidating insights, and recommending ongoing monitoring and enhancements. A thorough literature review explores the significance of mobile optimization in on-demand service platforms, delineating unique challenges and pertinent studies in the field. The methodology elucidates a systematic framework, and the results underscore the tangible impact of optimization efforts on X-Mech's performance metrics. The study culminates with recommendations for sustained optimization practices, embracing emerging technologies, and proactive measures for continual refinement. These findings contribute to elevating user experience standards, empowering service providers, and fostering a resilient ecosystem within the on-demand service sector.

MC1001 10:30-10:45	**Title: Assessment of the proposed Recycleph mobile application Using Six Thinking Hats and SWOT Analysis** **Authors:** GRACE LORRAINE INTAL, MARLO CAPALA, JOHN ERICK FRANY, NEIL TYRELL MIEMBRO, JORJ ANDREI SIONAL **Presenter:** JOHN ERICK FRANY, Mapua University, Philippines **Abstract:** This study introduces and assesses RecyclePH, a mobile application designed to tackle the solid waste crisis in the Philippines. The app facilitates direct connections between individual households and recycling facilities, assigning specific collectors to users. Users earn income by recycling their materials through the app, contributing to a more sustainable waste management system. Employing the Six Thinking Hats concept and SWOT/TOWS analysis, the research rigorously assesses the app's strengths, weaknesses, opportunities, and threats. Strengths include a robust reward system and image recognition, with identified weaknesses in UI design and response time. Utilizing Google Forms surveys, 50 respondents contribute insights, revealing positive user reception and emphasizing the need for UI design and response time improvements. The study serves as a strategic roadmap, advocating collaboration with local authorities, user engagement, and expanding the range of recyclable materials. Opportunities for optimization are identified, focusing on community engagement and education, while threats involve potential competition and user unfamiliarity with technology. The TOWS analysis suggests strategies to enhance RecyclePH's impact, emphasizing collaboration with local authorities. RecyclePH stands as a promising solution for sustainable waste management, with the potential to revolutionize waste disposal practices, foster environmental consciousness, and contribute to a cleaner, more environmentally conscious future in the Philippines.
MC1038 10:45-11:00	**Title: A Study of Modified Mobile Church Application for Filipino Catholics** **Authors:** Elcid Serrano, Matthew Oel Martinez, Angel Mcbrylle De Guzman, Charles Dustinn Lloyd Go, Mico Ruiz Linco, Miles Gabriel Macabeo, Drew Antoni Villasor **Presenter:** Elcid Serrano, Mapua University, Philippines **Abstract:** Eighty percent (80%) of Filipinos are Christians, and their strong religious faith led researchers to investigate mobile applications for Filipino Catholic churches. They found a lack of such apps and aimed to enhance "The Church" app to better serve Filipino Catholics. The study focused on adding features to the app based on feedback from users and existing research. A prototype was developed and tested with five (5) churchgoers aged 18-75 from four (4) churches in Dasmariñas City, Cavite. After using the prototype, participants completed a System Usability Scale (SUS) survey. Despite some issues with ease of use and efficiency, the prototype achieved an 88 SUS score, indicating above-average usability.
MC1049 11:00-11:15	**Title: FiliFoods: A Mobile Application in Cultivating Healthy Eating Habits and Cultural Appreciation Among Filipino Students Locally and Internationally** **Authors:** Adam Lee B. Buenaventura, Vince Daniel C. Del Rosario, Alen Alfred A. Navarro, Tricia Ann Bernadette C. Radovan, Christian Benjamin B. So, Elcid A. Serrano, Ma. Vivianne D. San Juan **Presenter:** Alen Alfred A. Navarro, Mapua University, Philippines **Abstract:** In the midst of trials in terms of academic challenges or lifestyle choices, college

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students are the general group of people in which time and convenience posts play a key role in how they can live their day-to-day lives. In this study, the researchers are able to dwell in incorporating the means of indulging in cultural (Filipino) culinary choices through the means of an application. This program promotes the means involvement between cultural endeavors, means of robust nourishment while not compromising how the user indulges in sufficing their everyday tasks and responsibilities time wise. This study properly utilized the means of User Experience Questionnaire to gather the thoughts and understanding of the users on the application proper which are namely that of college students. It was interpreted from the data that the Pragmatic scale scored a peak of 1.957, Hedonic Scale scoring highest at 1.512 and Overall Scale scoring at 1.771. The survey rated FiliFoods as user-friendly, interesting, and conventional, with varied opinions on information layout and innovativeness. Overall, the Short UEQ Scale showed positive evaluations.

MC1008 11:15-11:30	**Title: Leveraging Historical Measures for Bug Prediction in Android Applications** **Authors:** Dongyu Wang, Ran Mo, Wenjing Zhan, Yingjie Jiang **Presenter:** Ran Mo, Central China Normal University, China **Abstract:** Android applications have become increasingly pop ular, with billions of users relying on them for various tasks. However, the presence of bugs in these apps can lead to poor user experience, security problems, and financial losses. Bug prediction techniques offer a proactive approach that identifies potential bugs before they manifest in released applications. This paper presents an approach for bug prediction in Android apps by leveraging historical measures and applying the random forest algorithm. Through our evaluation of twelve real-world Android applications, we have demonstrated that our approach can effectively predict buggy files. This indicates the importance of historical data when assessing Android applications' quality and reliability. In addition, we have explored the importance of each historical measure in bug prediction. The corresponding results can provide insights guiding developers in selecting the important measures to build effective bug prediction models for Android applications.
MC1031 11:30-11:45	**Title: Threat Landscape Navigation: Mitigating Risks Through Integrated Mobile App Protection** **Authors:** Mary Jane C. Samonte, Aaron B. Chicano, Riel C. Victorio **Presenter:** Aaron B. Chicano, Mapua University, Philippines **Abstract:** Current literature investigates security issues with mobile applications in networked systems. By offering a multi-layered security plan that combines tried-and-true methods with Runtime Application Self-protection (RASP), this study expands on what is already known. RASP provides real-time attack detection and mitigation capabilities by continually monitoring mobile applications during runtime. This proactive strategy is meant to supplement more conventional techniques such as code hardening and access control. This study explores how mobile threats are changing and emphasizes how malware and data breaches are becoming more sophisticated. After that, it examines the security threats brought about by system integration, paying particular attention to the expanded attack surface and communication flaws. The study offers a thorough security framework that combines secure communication protocols (HTTPS), strong access control models (ABAC, STRBAC), and RASP to address these issues. Organizations can greatly improve the resilience of their mobile applications in networked environments by combining these few

	tactics. To set itself apart, this paper promotes a multi-layered defense strategy that incorporates RASP and offers insightful information to developers and businesses looking to enhance mobile application security in the complicated digital environment of today.

Session 6

Time: 13:30-15:30 (GMT+8, Beijing Time)
Date: Sunday, August 18
ZOOM ID: 875 8698 8633
Password: 081618
Zoom Link: https://us02web.zoom.us/j/87586988633
Topic: Machine Learning and Computation in Image Analysis
Chaired by: Dr. Branislav Vuksanovic, University of Portsmouth, UK

MC1003
13:30-13:45

Title: Classification of esophageal disease images based on deep fusion network with weight transfer

Authors: Hai Yang, Junyang Cao, Juan Wang

Presenter: Hai Yang, China West Normal University, Nanchong City, China

Abstract: Esophageal cancer (EC) is the sixth leading cause of cancer mortality and has one of the poorest survival rates among all cancers. Endoscopy is the usual method for diagnosing esophageal disease, but it may be subject to doctors' subjective judgments. Objective tools can assist doctors in enhancing their accuracy. This paper proposes a deep fusion network (DFY-Net) based on the weight transfer (WL) method, which uses the Kvasir public dataset, high-resolution images cropped from public video databases, and some private Barrett's esophagitis (BE) Endoscopy pictures. The FDY-Net architecture utilizes a modified ResNet50 network (named RY_RNet50) and VGG16 for feature extraction and selectively freezes specific layers during training. Its top-level part uses support vector machine (SVM) as a classifier to classify esophagitis and BE. Experimental results show that the overall classification accuracy of DFY-Net is as high as 97.71%, of which the accuracy of esophagitis is 97.22% and the accuracy of BE is 99.11%. Additionally, we use Grad-CAM (Gradient Weighted Class Activation Map) to increase the interpretability of the model. This study can provide an objective reference for endoscopists' diagnosis, help improve the diagnostic accuracy of esophageal diseases, and play an important role in the prevention of esophageal cancer.

MC1082
13:45-14:00

Title: Visual Analysis of Tobacco Leaf Recognition Research Based on CiteSpace

Authors: Dai Yanting, Zhou Hua

Presenter: Dai Yanting, Southwest Forestry University College, China

Abstract: This study utilizes CiteSpace software to conduct a visual analysis of the literature in the field of tobacco leaf recognition technology in recent years, aiming to reveal the research hotspots, development trends, and contributions of key institutions and scholars in this domain. By analyzing the changes in the number of publications, keyword co-occurrence networks, author collaboration patterns, and keyword burst situations, this paper demonstrates the in-depth exploration and innovation in both basic research and practical applications of tobacco leaf recognition technology. Firstly, through the analysis of the annual publication volume, we found that research on tobacco leaf recognition has shown a significant growth trend over the past decade, indicating the increasing importance of this field in both academia and industrial applications. Secondly, the analysis of research institutions and authors reveals the dominant positions of institutions such as the Chinese Academy of Agricultural Sciences, the Chinese Academy of Sciences, and Nanjing Agricultural University, as well as the outstanding contributions of scholars like Wang Ying, Wang Lu, and Guo Yongfeng in terms of publication volume and collaboration

relationships. Furthermore, the keyword co-occurrence network and cluster analysis show that the research focus of tobacco leaf recognition technology covers multiple keyword groups, including gene expression, transcription factors, plant resistance, and biosynthesis, reflecting researchers' multifaceted efforts in theoretical exploration and practical applications. Finally, the keyword burst analysis reveals the rise and fall of keywords in different periods. For instance, the period from 2014 to 2017 was mainly concentrated on "gene expression" and "transgenic tobacco," while from 2018 to 2020, emerging research hotspots such as "functional analysis" and "cell death" became prominent. This study provides profound insights and significant references for the future development of tobacco leaf recognition technology, offering theoretical and practical guidance for its application in the tobacco industry by academia and industry.

MC1073
14:00-14:15

Title: Mitigating Vishing in Digital Banking through Caller Authentication and Verification Technologies

Authors: Mary Jane C. Samonte, Jonathan K. Callejo, Daimler Chrysler N. Lumbera, Josh Chi B. Ocaya

Presenter: Josh Chi B. Ocaya, Mapua University, Philippines

Abstract: This paper investigates various caller authentication and verification technologies to mitigate vishing attacks within the banking sector, a significant and growing threat in the era of digital banking. Vishing attacks exploit telephone communications' personal and direct nature to deceive individuals into revealing sensitive information, posing substantial risks to financial security and consumer trust. This paper reviews the effectiveness of several technologies, including Caller ID verification, voice biometrics, two-factor authentication, and blockchain-based authentication. It discusses the application and limitations of these technologies, emphasizing a multi-layered security approach to enhance protection against sophisticated cyberattacks. The review extends to sector-specific adaptations and pilot implementations, highlighting the practical challenges and successes. Future directions for research focus on real-world applications, user acceptance, and the integration of advanced technologies to further secure digital banking against vishing.

MC1027
14:15-14:30

Title: Automated Waste Classification using Convolutional Neural Network

Authors: Rajermani Thinakaran, J. Somasekar, Vikram Neerugatti, P. Guru Saran

Presenter: P. Guru Saran, INTI International University Negeri Sembilan, Malaysia

Abstract: Efficient waste management relies on precise waste classification, which facilitates recycling, composting, and appropriate disposal. Conventional waste classification methods often involve manual sorting or simple rule-based systems, which are labor intensive and prone to errors. This study investigates the application of Convolutional Neural Networks (CNNs) for automated waste classification using image data. CNNs have shown significant success in various image classification tasks due to their ability to learn hierarchical features directly from pixel values. The methodology outlined covers data collection, preprocessing, model architecture design, and training procedures for the CNN model. Experimental results demonstrate the effectiveness of the CNN approach in accurately categorizing various waste types. Additionally, we discuss the practical implications of CNN-based waste classification systems for real-world waste management applications. By leveraging CNNs, waste management processes can be optimized, leading to better resource utilization and environmental sustainability. The authors also highlight potential avenues for future research, including exploring advanced CNN architectures and integrating emerging technologies like Internet of Things (IoT) sensors for improved waste

management solutions. Overall, this study emphasizes the potential of CNNs to transform waste classification practices and enhance the efficiency of waste management systems.

MC1029 14:30-14:45	**Title: Advancements in Skin Cancer Detection: A Comprehensive Review of Convolutional Neural Network Approaches** **Authors:** Rajermani Thinakaran, J. Somasekar, Vikram Neerugatti, Krishna Ganga **Presenter:** Krishna Ganga, INTI International University Negeri Sembilan, Malaysia **Abstract:** Skin cancer is one of the most prevalent types of cancer globally, with its incidence steadily rising over the past decades. Early and accurate detection of skin cancer plays a pivotal role in improving patient outcomes and reducing mortality rates. In recent years, Convolutional Neural Networks (CNNs) have emerged as powerful tools for automated image analysis and classification, offering promising results in various medical imaging tasks, including skin cancer detection. This paper provides a comprehensive review and analysis of CNN-based approaches for skin cancer classification. We discuss the challenges associated with traditional methods of skin cancer diagnosis and highlight the potential of CNNs in addressing these challenges. Furthermore, we survey state-of-the-art CNN architectures, dataset collections, preprocessing techniques, and evaluation metrics commonly used in skin cancer classification tasks. We also delve into the transfer learning and data augmentation strategies employed to improve model generalization and robustness. Additionally, we review recent advancements in interpretability techniques for CNNs, which enhance the transparency and trustworthiness of automated skin cancer diagnosis systems. Finally, we discuss the limitations and future directions of CNN-based approaches in skin cancer classification, emphasizing the need for large-scale, diverse datasets, standardized evaluation protocols, and interdisciplinary collaborations to facilitate the clinical translation and deployment of CNN-based diagnostic tool.
MC1063 14:45-15:00	**Title: Artificial Intelligence in Analyzing Medical Imaging in Detecting Cancers** **Authors:** Mary Jane C. Samonte, David Matthew D. Antonio, Eduardo Jose P. Del Rosario, Paul Vincent E. Contreras, Lance H. Salvador, Lex Anilov T. Ogaya **Presenter:** Lex Anilov Ogaya, Mapua University, Philippines **Abstract:** Challenging to diagnose early on due to its nature of being our own cells; we likely only realize we have it when it gets bad. Artificial Intelligence is a trending field in computer science whose relevance is attributed to its ability to be a solution to almost every problem. Research is trying to implement Artificial Intelligence in diagnosing cancer from image samples of patients. Through the PRISMA protocol, we systematically obtained literature from 2018 until now for a systematic literature review. Various AI architectures and features are presented and discussed. We also examine the overall reception of research into the application of AI in clinical practices. The analysis and results of this paper are meant to serve as a basis for anyone deciding if AI would be reliable for clinical practice. Our results show that the AI models have enough capability to be a feasible solution to assist doctors in diagnosis, and many researchers show confidence in future applications of AI in the clinic. In our statistical analysis, even when their technique is different, the different implementations perform similarly to others, they have accuracies scores above 80 and they deviate similarly, except for SVM. The analysis and results of this paper are meant to serve as a basis for anyone deciding if AI would be reliable for clinical practice. Our results show that the AI models have enough capability to be a feasible solution to assist doctors for diagnosis, and many researchers show confidence in future applications of AI in the clinic.

MC1044 15:00-15:15	**Title: HalamanPH: Mobile Object Detection of Orchid Plants** **Authors:** Katrice Asher G. Albano, Andre A. Aquino, Matthew Raphael C. Corbe, Gabriel Isiah G. Fortes, Cloe A. Rosario, Elcid A. Serrano **Presenter:** Elcid Serrano, Mapua University, Philippines **Abstract:** Plant detection systems have significantly benefited industries such as agriculture, environmental management, and ecological monitoring. Data augmentation plays a crucial role in developing accurate object detection models, involving techniques like cropping, resizing, flipping, and scaling to enhance the training dataset's robustness. HalamanPH, an Android-based object detection application developed for this study, addresses the need for comprehensive information on Philippine flora, featuring six plant species. Evaluation by two respondents, (1) BS Biology student from UP Baguio, and (1) botanist from Philippine Taxonomic Initiative, confirmed the application's performance. Moving forward, integrating additional functionalities and expanding datasets within the application is recommended to further enhance its overall performance and utility in future projects across various industries.
MC1076 15:15-15:30	**Title: DriSafeph: An IoT Based Realtime Driver Drowsiness Detection System using Hybrid Machine learning Algorithm** **Authors:** Kenneth Von C. Golosinda, Neil P. Magloyuan, Jasper Van D. Marcellones, Patrick D. Cerna **Presenter:** Neil P. Magloyuan, Mapua Malayan College Mindanao, Philippines **Abstract:** Driver drowsiness contributes significantly to road accidents worldwide, and while drowsiness detection systems have already been implemented on higher-end cars, this research introduces an embedded system using a Raspberry Pi that can be implemented in any enclosed vehicle. It aims to address the prevalent issue of driver drowsiness on the road by developing a real-time driver drowsiness detection system and leveraging a hybrid machine learning algorithm that processes facial landmarks and gestures to accurately detect drowsiness, which has yet to be used in its field and will be compared to other algorithms already in use. Additionally, the researcher aims to provide a warning notification to the driver through a text-to-speech algorithm when the appropriate drowsiness level is detected and optimize the machine learning model's performance. The study conducted a survey to gather drivers' opinions on a drowsiness detection system and their personal experiences with drowsy driving. The results showed that the respondents viewed the working prototype positively. Additionally, the data revealed that more than 70% of the respondents had experienced drowsy driving, highlighting the need for such a device. The recommended approach of the DriSafePh model was evaluated using a performance matrix, and the detection for the face, eye, and mouth provides a high accuracy level of 96–99%. In the meantime, eye closure and yawn detection accuracy were able to match the other existing algorithms on the Raspberry Pi device with an accuracy of 96.89% and 85.93%, respectively.

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