iiWAS 2023

MoMM 2023

The 25th International Conference on Information Integration and Web Intelligence (iiWAS2023)
The 21st International Conference on Advances in Mobile Computing & Multimedia Intelligence (MoMM2023)

4 - 6 December 2023, Denpasar - Bali, Indonesia

@WAS
Web Applications Society

JKU
Institute for Telecooperation

UNIVERSITAS UDAYANA

PROGRAMBOOK

The 25th International Conference on Information Integration and Web Intelligence
(iiWAS2023)
The 21st International Conference on Advances in Mobile Computing & Multimedia Intelligence
(MoMM2023)
4 - 6 December 2023, Denpasar - Bali, Indonesia

The 25th International Conference on Information Integration and Web Intelligence (iiWAS2023)

and

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CONTENT

The 25th International Conference on Information Integration and Web Intelligence
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Welcome Message

"Welcome to iiWAS and MoMM 2023 Conferences"

iiWAS was founded 25 years ago to address the critical need for an international conference focused on the evolving landscapes of information integration and web-based applications and services. Four years later, in 2003, it was joined by MoMM, a conference dedicated to the ways in which mobile multimedia can be used to augment web-based applications.

iiWAS and MoMM are now two international conferences that have been at the forefront of innovation in web-based applications and mobile multimedia. The conferences have provided a forum for researchers and practitioners from around the world to share their latest findings and insights on the latest trends and technologies in the field. iiWAS and MoMM have also played a vital role in fostering collaboration and innovation.

Gabriele Kotsis

As the organizers of this conference, it brings us immense satisfaction to witness iiWAS and MoMM evolution. What began as a gathering of forward-thinking academics 25 years ago in Indonesia has now blossomed into a remarkable global assembly, with over 3000 international participants, distinguished speakers, and esteemed guests in the past years.

iiWAS and MoMM 2023 owes its success to the collaborative efforts of Web Applications Society (@WAS), the Institute of Telecooperation at Johannes Kepler University Linz, and Udayana University for their generosity, unwavering commitment and hard work in making iiWAS and MoMM 2023 a big success

Ismail Khalil

Our commitment remains unwavering in providing you with three distinct experience:
• A Learning experience: This year's program boasts a robust lineup of 70 thought-provoking presentations across 20 sessions, two distinguished keynote talks and the ABC (AI-Big Data Convergence) Forum which consists of a tutorial and a panel.
• A Networking experience: You'll have the opportunity to cultivate valuable partnerships and enduring friendships with like-minded scholars across the globe. The diversity is evident, with participants from 28 countries and representation from over 75 research and academic institutions.
• A Motivational experience: Our emerging colleagues will be exposed to the latest breakthroughs in our fields, propelling them towards their own research and discoveries. The social program is equally captivating, featuring a Welcome Reception and a Conference Dinner.

Pari Delir Haghighi

As organizers, we extend our heartfelt gratitude to the iiWAS and MoMM conferences program committee chairs, along with all committee members, for their meticulous review of paper submissions and for crafting this captivating program. We are confident that the presentations and talks in this year's lineup will leave you inspired and foster future collaborations.
Our sincere appreciation goes out to our distinguished speakers: Prof René Mayrhofer from Johannes Kepler University, Linz, Austria, Prof. Maureen Tanner from University of Cape Town, South Africa, Prof. Won Kim from Gachon University, South Korea and Prof. Stéphane Bressan from the National University of Singapore.

On behalf of all the participants, we would like to express our sincere gratitude to the organising committee at Udayan University for organizing such a wonderful conference. It was a truly enriching and informative experience, and we are so grateful for all their hard work and dedication. Every effort has been made to ensure your comfort and convenience. The dedication of these individuals, and countless others working behind the scenes, contributes to the unique atmosphere that makes each iiWAS and MoMM conferences feel like a welcoming homecoming.
So, welcome to Bali for the 2023 iiWAS and MoMM conferences. We extend our heartfelt gratitude for your participation and sincerely hope you find immense enjoyment in this conference."

Gabriele Kotsis
Ismail Khalil
Pari Delir Haghighi

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The Organisation

Steering Committee:
- Gabriele Kotsis, Johannes Kepler University Linz, Austria
- Ismail Khalil, Johannes Kepler University Linz, Austria
- Pari Delir Haghighi, Monash University, Australia
- Eric Pardede, La Trobe University, Australia
- Dirk Draheim, Tallinn University of Technology, Estonia
- Syopiansyah Jaya Putra, Universitas Islam Negeri, Indonesia

Program Committee Chairs:
- Pari Delir Haghighi, Monash University, Australia – MoMM2023
- Gillian Dobbie, University of Auckland, New Zealand – iiWAS2023
- Vithya Yogarajan, University of Auckland, New Zealand – iiWAS2023

@WAS Organizing Committee:
- Hesti Sudjana, @WAS Organization/Johannes Kepler University Linz, Austria
- Paul Wiesinger, Johannes Kepler University Linz, Austria
- Heriansyah, Johannes Kepler University Linz, Austria

Host University Organizing Committee:
- Linawati, Udayana University, Indonesia
- I Nyoman Budiarsa
- Kadek Diana Harmayani
- I Gusti Ketut Sukadana
- I Made Agus Dwi Suarjaya
- I Putu Agung Bayupati, Udayana University, Indonesia
- Ngurah Agus Sanjaya ER, Udayana University, Indonesia
- Desy Purnami Singgih Putri
- Ni putu Sutramiani
- Fajar Punama
- Wayan Oger Vihikan
- Agus Muliantara

Co-Organizers & Sponsors:
- Web Application Society (@WAS)
- Johannes Kepler University Linz (JKU Linz)
- Udayana University
- ASEA-UNINET

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Keynote Speakers

Keynote Talk,
Monday, 4 December 2023 – 09:30 – 10:30

The Domestication of ChatGPT by University Students
Maureen Tanner, *University of Cape Town, South Africa*

Abstract

Recent technological advancements have brought about significant disruptions in various aspects of society, including the field of education. Among these advancements, Artificial Intelligence (AI) has made remarkable strides, leading to the development of OpenAi's ChatGPT. With its extraordinary capabilities, ChatGPT has gained widespread attention on social media platforms and news outlets worldwide. This generative AI tool has also found its way into educational settings, where students have embraced and domesticated its usage. However, the incorporation of ChatGPT in education remains a subject of controversy. While some view it as a potential facilitator of teaching and learning, others express concerns that it might lead to students becoming overly reliant on AI tools, hampering their analytical skills and overall engagement. Nevertheless, the undeniable potential of ChatGPT to enhance students' learning experiences and improve educational outcomes cannot be overlooked. As university students adopt to this technological advancement, exploring the implications of ChatGPT's domestication within the educational environment becomes imperative. In light of this, this talk offers insights into how technological innovations, such as ChatGPT, are domesticated by university students, with a specific focus on the commodification phase, the appropriation phase, and the conversion phase. Insights are provided on how students engage with and integrate ChatGPT into their educational activities, highlighting the opportunities, challenges, and outcomes associated with its domestication.

Short Bio

Professor Maureen Tanner is the Head of Department for Information Systems at the University of Cape Town, South Africa. Prof Tanner's research agenda explores Software Development (SD) from various perspectives. Similar to a "value-chain", the perspectives help to understand the software development discipline better and are linked with each other. The various perspectives focus on software engineering issues, team collaboration and management, Software Development context, end-user perspectives, the impact of software solutions on people and society, as well as how to disseminate Software Development-related knowledge. Her research contributions are highly relevant to both practitioners and academia. Through in-depth case studies, she has acquired knowledge of the latest software development techniques that practitioners employ and strive to inculcate this knowledge to postgraduate students. These essential components of her Software Development research "value-chain", contribute to the ultimate aim of delivering quality software that makes a valuable impact on people, business and society.

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Keynote Speakers

Keynote Talk,
Tuesday, 5 December 2023 – 09:00 – 10:00

The Android Platform Security Model (and the security status of actual devices)
René Mayrhofer, *Johannes Kepler University Linz, Austria*

Abstract

This talk is about the Android platform with over 3 Billion active devices - not even counting devices that are based on AOSP (the Android Open Source Project code) but are not officially Android. Providing security guarantees in such a massive and diverse ecosystem with multiple stakeholders is a major challenge. This keynote will present the main aspects of the security model, system architecture, and mitigations and safeguards developed over more than 10 years. Some of the early design decisions shaped the platform from the start and still form the foundation for its current security posture, while many additional safeguards were added over time. More recently, an academic consortium has started building a public transparency database for collecting measurements about the security status of devices, both from special device farms under laboratory settings and from in-the-field devices through crowd sourcing. Using such data to check for compliance with the Android platform security model and potentially ranking devices based on their security attributes is another interesting challenge. In this keynote, we will also present the current state of this database and ides for next steps.

Short Bio

René Mayrhofer is currently heading the Institute of Networks and Security at Johannes Kepler University Linz (JKU), Austria. Between 2017 and 2019, he was the Director of Android Platform Security at Google in Mountain View (US) and helped make recent advances in usable, mobile security research available to the Billions of Android users. Since his return to Linz, he continues to be involved with Android security as a domain expert to foster exchange and collaboration between Android teams at Google and academic research groups and is now leading a new Christian Doppler Laboratory on "Private Digital Authentication in the Physical World" to proactively answer upcoming questions on privacy in cloud-based digital identity systems.

Previously, he held a full professorship for Mobile Computing at Upper Austria University of Applied Sciences, Campus Hagenberg, a guest professorship for Mobile Computing at University of Vienna, and a Marie Curie Fellowship at Lancaster University, UK. His research interests include computer security, mobile devices, network communication, and machine learning, which he currently brings together in his research on securing mobile devices and digital identity. Within the scope of u'smile, the Josef Ressel Center for User-friendly Secure Mobile Environments, his research group looked into full-stack security of mobile devices from hardware through firmware up to user interaction aspect. One particular outcome was a prototype for a privacy conscious Austrian mobile Driving License (AmDL) on Android smartphones supported by tamper-resistant hardware. Research results and concepts from this prototype are being contributed to the upcoming ISO 18013-5 standard for international mobile driving licenses and have directly influenced the new Identity Credentials framework in Android 11. René has contributed to over 100 peer-reviewed publications and is a reviewer for numerous journals and conferences. He received Dipl.-Ing. (MSc) and Dr. techn. sub ausipiciis praesidentis rei publicae (PhD) degrees from Johannes Kepler University Linz, Austria and his venia docendi for Applied Computer Science from University of Vienna, Austria.

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ABC Forum

ABC (AI-Big Data Convergence) Forum
Monday, 4 December 2023 – 13:30 – 16:00

Tutorial

Demystifying Large Language Models and Generative Pretrained Transformer

Won Kim, *Gachon University, South Korea*

The release of ChatGPT from OpenAI has generated huge excitement and interest in Large Language Models (LLMs). Many companies have been busy developing their own LLMs and applications of the LLMs.
An LLM is a computer algorithm that processes natural language inputs and predicts the next word based on what it has already seen. LLMs use the transformer, which is a type of neural network architecture. GPT (generative pretrained transformer) is the name OpenAI has given to its LLM, and has become perhaps the best-known LLM.
In this tutorial, I will explore what LLM is and how it works, with emphasis on GPT. In particular, I will examine how input text is transformed into vectors and matrices of numbers, and how they flow through key layers of the transformer architecture. I will also discuss the opportunities and issues of the LLMs.
The tutorial is organized as follows:
- Introduction to LLM
- LLM training and inference
- GPT performance
- Input text tokenization
- Input token embedding and position encoding
- Attention concept
- Transformer architecture
- How Attention works
- Evolution of the GPT models
- Opportunities and issues of the LLMs

Short Bio
Won Kim is currently a distinguished professor with the School of Computing in Gachon University, near Seoul, Korea. He is also AI Vice President of Gachon University and Managing Director of the National Program of Excellence in Software Education at Gachon University, sponsored by the Korean Ministry of Science & Technology and Information Communication Technology.

Before joining the faculty of Gachon University, he was a professor with SKKU (SungKyunKwan University), and a senior vice president of Samsung Electronics, both in Korea.

He was the founder and CEO of UniSQL (where he led the development of world's first object-relational database system) and also Cyber Database Solutions in the US. Before founding UniSQL, he worked as a researcher at IBM Almaden Research Center; and as a research director at MCC(Microelectronics and Computer Technology Corporation), where he led a team that developed the ORION object-oriented database system (one of the first OODBs).

He received a Ph.D. in computer science from the University of Illinois at Urbana-Champaign.
In 2017, he received an Order of Service Merit Medal from the Government of Korea for his services to IT industry for both the US and Korea. In 2018, he received an Alumni Outstanding Educator Award from the Computer Science Department of the University of Illinois at Urbana-Champaign.

In the US, he served as Chair of ACM (Association of Computing Machinery) SIGMOD (special interest group on management of data) and founding Chair of ACM SIGKDD (special interest group on knowledge discovery and data mining). He also served as Editor-in-Chief of ACM Transactions on Database Systems, and founding Editor-in-Chief of ACM Transactions on Internet Technology..

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ABC Forum

ABC (AI-Big Data Convergence) Forum
Monday, 4 December 2023 – 13:30 – 16:00

Panel

The Future of LLMs

Large language models (LLMs) are a type of artificial intelligence that are trained on massive datasets of text and code. They can generate text, translate languages, write different kinds of creative content, and answer your questions in an informative way. LLMs are still under development, but they have already had a significant impact on a wide range of industries and applications.
This panel will discuss the future of LLMs, including the following topics:
-New and emerging applications of LLMs. How will LLMs be used in the future? What new possibilities will they open up?
-The challenges of developing and deploying LLMs. LLMs are complex and computationally expensive to train and deploy. What are the challenges that need to be overcome in order to make LLMs more accessible and affordable?
-The ethical and social implications of LLMs. LLMs have the potential to be used for good or for bad. What are the ethical and social implications of this technology? How can we ensure that LLMs are used responsibly?

The panel will feature experts from academia, industry, and government. They will share their insights and perspectives on the future of LLMs and discuss the challenges and opportunities that lie ahead.

This panel will provide a valuable opportunity to learn about the future of LLMs and the challenges and opportunities that lie ahead. It will also be a forum for discussion and debate about the ethical and social implications of this technology.

Moderator:
Stéphane Bressan, *National University of Singapore, Singapore*

Stéphane Bressan is Associate Professor in the Department of Computer Science of the School of Computing (SoC) of the National University of Singapore (NUS). Stéphane is Track Leader for Maritime Information Technologies at NUS Centre for Maritime Studies (CMS), Affiliate Professor at NUS Business Analytics Centre, Faculty Affiliate at NUS Institute of Data Science, and a member of the Image & Pervasive Access Lab (IPAL) (Singapore-France CNRS UMI 29255).
In 1990, Stéphane joined the European Computer-industry Research Centre (ECRC) of Bull, ICL, and Siemens in Munich (Germany). From 1996 to 1998, he was Research Associate at the Sloan School of Management of the Massachusetts Institute of Technology (MIT) (United States of America).
Stéphane's research interest is the integration, management, and analysis of data from heterogeneous, disparate, and distributed sources. Stéphane has developed expertise in data- and physics-driven modelling, simulation, and optimisation with data mining and machine learning algorithms.

Panelist
Ngurah Agus Sanjaya ER, *Udayana University, Indonesia*

Ngurah Agus Sanjaya ER is an Associate Professor in Informatics Department at Udayana University. His research mainly focuses on automatic extraction of information from semi or unstructured data. He finished his PhD from Télécom Paristech, Paris - France, in which he defended his Doctorate thesis entitled "Advanced Information Extraction by Example". He addresses in this thesis an alternative method of searching for information, i.e. by giving examples of the information in question. He first tries to improve the accuracy of the search by example systems by expanding the given examples syntactically. Later, he uses truth discovery paradigm to rank the returned query results. Finally, he investigates the possibility of expanding the examples semantically through labelling each group of elements of the examples. He currently continues his work on text mining focusing on preserving Balinese language through machine learning. He has published articles on Stemmer, and Part-of-Speech (POS) tagger for Balinese language. He develops a digital portal and a mobile application for Balinese folklore stories where he implemented all of his research. His research interests also include (but not limited to) truth discovery, natural language processing, data mining and big data.

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ABC Forum

Panelist
Gabriele Kotsis, Johannes Kepler University Linz, Austria

Gabriele Kotsis is Full Professor in computer science at Johannes Kepler University, Linz, Austria, and Past President of the ACM. Receiving recognition for her work from the very beginning (her master 's thesis, submitted at the University of Vienna in 1991, was honored with the student sponsorship award of the Austrian Computer Society, and her PhD in 1995 was honored with the highly prestigious HeinzZemanek award) was doubtlessly a motivating factor for her and her decision to dedicate her career to research in academia and to the scientific community. In 2002, she was one of the co-founding chairs of the working group for professors in computer science within the Austrian Computer Society (OCG). From 2003 to 2007 she was President of the Austrian Computer Society, being the first female holding this position in Austria. In addition to her two-term presidency at OCG, Gabriele takes an active part in the Editorial Board of the OCG Book Series, in the working group Fem-IT (Association of Female University Professors in IT) and in the OCG award committee. From 2007 to 2015 she served as Vice-Rector for Research at Johannes Kepler University (JKU). Her responsibilities included the development of R&D strategies and policies within the university, coordination and interaction with national and international governmental organisations and funding bodies, and the establishment of collaborations with other research organisations and business partners. From 2016 to 2020, Gabriele Kotsis has been JKU´s representative in the ASEA-UNINET academic research network, which promotes cooperation among European and South-East Asian public universities. Her active involvement in this network led to her nomination and election as President for the current period, February 2019 to July 2022, and to her election as Austrias National Coordinator from 2020 on.

Panelist
A Min Tjoa, Vienna University of Technology, Austria

A Min Tjoa received his Ph.D. in Computer Science from the Johannes Kepler University in Linz, Austria, and has been a Professor of Software Technology at the Vienna University of Technology since 1994, with research expertise in data warehousing, business intelligence, cybersecurity, and environmental informatics. He is the author of more than 200 peer-reviewed articles.
Currently, he is also an Adjunct Professor at ITB (Bandung Institute of Technology).
He is the Executive Chairman of the Austrian National Competence Center for Excellent Technologies in the field of IT Security (SBA). He was the President of the United Nations Commission on Science and Technology for Development (UN-CSTD) in 2019/2020 and its Vice President from 2020 to 2022.
He was Honorary Secretary of IFIP (International Federation of Information Processing) from 2013 to 2019 and Vice President of Infoterm (International Information Center for Terminology).
He is also President of the Austrian-Indonesian Society (since 2017).
He is a member of the Executive Board of the ASEAN-European Academic University Network (ASEA-UNINET). He has received an honorary doctorate from the Czech Technical University in Prague and an honorary professorship from Hue University in Vietnam.

Panelist
Dirk Draheim, Tallinn University of Technology, Estonia

Dirk Draheim received the PhD from Freie Universität Berlin and the habilitation from Universität Mannheim, Germany. Currently, he is full professor of information society technology at Tallinn University of Technology (Taltech), Estonia, head of the Taltech Information Systems Group and holds the Taltech National Professorship in Information Society Technology. The Information Systems Group conducts research in large and ultra-large-scale IT systems. Dirk (co-)authored over 200 publications and is author of the Springer books ``Business Process Technology", ``Semantics of the Probabilistic Typed Lambda Calculus" and ``Generalized Jeffrey Conditionalization", and co-author of the Springer book ``Form-Oriented Analysis". He is also an initiator and leader of numerous digital transformation initiatives.

Conferences & Workshops Program

Program Structure

Time	Monday, 4 December 2023		
08:00 – 09:00	**Registration** @Lobby ground floor		
09:00 – 10:30	Aula Room – R.3.01 @3rd floor **Opening & Keynote Talk I**		
10:30 – 11;00	*Morning Coffee break @Lobby 3rd floor*		
	Track 1 R.3.08 @3rd floor	**Track 2** R.3.10 @3rd floor	**Track 3** R.3.09 @3rd floor
11:00 – 12:30	**iiWAS Session 1** **Business Data & Application 1**	**iiWAS Session 2** **Data Management 1**	**MoMM Session 3** **Security in Mobile Environments**
12:30 – 13:30	*Lunch @Lobby 3rd floor*		
13:30 – 15:00	Aula Room – R.3.01 @3rd floor **ABC (AI-Big Data Convergence) Forum** **Tutorial** **Demystifying Large Language Models and Generative Pretrained Transformer**		
15:00 – 15:30	*Afternoon Coffee break @Lobby 3rd floor*		
15:30 – 17:00	Aula Room – R.3.01 @3rd floor **ABC (AI-Big Data Convergence) Forum** **Panel Discussion** **The Future of LLMs**		
17:00 – 19:00	**Welcome Reception** **Central Park, Udayana University Campus Sudirman**		

Time	Tuesday, 5 December 2023		
08:00 – 09:00	**Registration** @Lobby ground floor		
09:00 – 10:00	Aula Room – R.3.01 @3rd floor **Keynote Talk II**		
10:00 – 10:30	*Morning Coffee break @Lobby 3rd floor*		
	Track 1 R.3.08 @3rd floor	**Track 2** RK.2.05 @2nd floor	**Track 3** R.3.09 @3rd floor
10:30 – 12:00	**iiWAS Session 3** **Deep & Machine Learning 1**	**iiWAS Session 4** **Generative AI**	**MoMM Session 2** **Mobile Computing and Wireless Sensors**
12:00 – 13:00	*Lunch @Lobby 3rd floor*		
13:00 – 14:30	**iiWAS Session 5** **Image Data & Knowledge Graph I**	**iiWAS Session 6** **Similarity Measure & Metric I**	**MoMM Session 3** **Image and video processing**
14:30 – 15:00	*Afternoon Coffee break @Lobby 3rd floor*		
15:00 – 16:00	**iiWAS Session 7** **Business Data & Application II**	**iiWAS Session 8** **Topic and Text Matching I**	**iiWAS Session 9** **Data Management II &** **Similarity Measure & Metric II**
19:00 – 21:30	**Conference Dinner & Best Paper Award** **@ Breeze Garden, Mercure Sanur Resort Bali** Jl. Mertasari, Sanur, South Denpasar, Bali		

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Conferences & Workshops Program

Time	Wednesday, 6 December 2023		
08:00 – 09:00	**Registration** @Lobby ground floor		
	Track 1 R.3.08 @3rd floor	**Track 2** RK.2.05 @2nd floor	**Track 3** R.3.09 @3rd floor
09:00 – 10:30	**iiWAS Session 10** Image Data & Knowledge Graph II	**iiWAS Session11** Deep & Machine Learning II & Topic and Text Matching II	**iiWAS Session 12** Recommendation Systems
10:30 – 11:00	*Morning Coffee break @Lobby 3rd floor*		
	Track 1 R.3.08 @3rd floor	**Track 3** R.3.09 @3rd floor	
11:00 – 12:00	**iiWAS Session 13** Business Data & Application III	**MoMM Session 4** Security in mobile environments & Mobile Computing and Wireless Sensors & Image and video processing	
12:00 – 12:30	Aula Room – R.3.01 @3rd floor **Closing Session**		
12:30 – 13:30	*Lunch @Lobby 3rd floor*		

Room Allocations:
The conference is located at Gedung Faklutas Pasca Sarjana (Postgraduate Faculty Building), Udayana University, Sudirman Campus, Denpasar - Bali

The Meeting rooms:
- Aula Pasca Sarjana (Postgraduate Assembly Room), 3rd Floor : Opening , Plenary and Closing Session
- Room R.3.08, 3rd Floor: Track 1
- Room R.3.09, 3rd floor: Track 3
- Room R.3.10, 3rd Floor: Track 2 (Monday only)
- Room RK.2.05. 2nd Floor: Track 2 (Tuesday * Wednesday)

Registration Desk: Lobby ground floor
Lunch & Coffee Break: Lobby 3rd Floor
Welcome Reception: Central Park, garden ground floor

2nd floor plan

3rd floor plan

Monday, 4 December 2023

08:00 – 09:00	Registration and Morning Coffee	**Lobby ground fl.**
09:00 – 10:30	**Opening Session**	**Aula Room – R.3.01, 3rd fl.**

• Welcome & Opening speech from:
   - Host University Organising Chair
   - Vice Rector Udayana University
   - General Conference Chair & Program Committee Chair
• Token appreciation from WAS organisation to Host University
• Group Photo

Keynote Talk 1:
"The Domestication of ChatGPT by University Students"
Maureen Tanner, *University of Cape Town, South Africa*

10:30 – 11:00	**Morning Coffee Break**	**Lobby 3rd fl.**

11:00 – 12:30	**Parallel Session**	
	Track 1: iiWAS session 1	**R.3.08, 3rd fl.**
	Business Data & Application 1	

• **How Domain Engineering Can Help to Raise Adoption Rates of Artificial Intelligence in Healthcare**
  Markus Bertl, Toomas Klementi, Gunnar Piho, Peeter Ross, Dirk Draheim
  Estonia
• **Enhancing AI Adoption in Healthcare: A Data Strategy for Improved Heart Disease Prediction Accuracy through Deep Learning Techniques**
  Rohan Deshamudre, Sahand Ziabari, Marc van Houten
  The Netherlands
• **WISHFUL - Website Extraction of Institutional Sources with Heterogeneous Factors and User-driven Linkage**
  Saijal Shahania, Myra Spiliopoulou, David Broneske
  Germany
• **DISA - A Blockchain-Based Distributed Information Security Audit**
  Lukas König, Martin Pirker, Herfried Geyer, Michael Feldmann, Simon Tjoa, Peter Kieseberg
  Austria

11:00 – 12:30	**Track 2: iiWAS Session 2**	**R.3.10 @3rd fl.**
	Data Management 1	

• **Towards a Unified Symbolic AI Framework for Mining High Utility Itemsets**
  Amel Hidouri, Badran Raddaoui,Said Jabbour
  France
• **RDF Data Partitioning for Efficient SPARQL Query Processing with Spark SQL**
  Kosuke Yamasaki, Toshiyuki Amagasa
  Japan
• **A Comparative Evaluation of Additive Separability Tests for Physics-Informed Machine Learning**
  Zi-Yu Khoo, Jonathan Sze Choong Low, Stéphane Bressan
  Singapore
• **Data integration in a multi-model environment**
  Jaroslav Pokorný
  Czech Republic

Program Details

11:00 – 12:30	**Track 3: MoMM Session 1**	**R.3.09 @3rd fl.**

Security in Mobile Environments
- **Anonymously publishing liveness signals with plausible deniability**
  Michael Sonntag, Rene Mayrhofer, Stefan Rass
  Austria
- **Analysis of data obtained from the mobile botnet**
  Jaroslaw Kobiela, Piotr Urbaniec
  Poland
- **On the Impact of FFP2 Face Masks on Speaker Verification for Mobile Device Authentication**
  David Sedlak, Rainhard Dieter Findling
  Austria
- **Blockchain-Enhanced IoHT: A Patient-Centric Internet of Healthcare Things Platform with Smart Contract-Driven Data Management**
  Bang N. H., Khoa T. D., Triet M. N., Khanh V. H., Khiem H. G., Bao Q.T., Phuc N. T., Hieu M. D., Loc V.C.P., Quy T. L., Anh N. T., Hien Q.N., Bang L. K., Trong D.P.N., Ngan N. T. K., Son H., Luong H. H.
  Vietnam

12:30 – 13:30	**Lunch**	**Lobby 3rd fl.**

13:30 – 15:00	**ABC (AI-Big Data Convergence) Forum**	**Aula Room – R.3.01, 3rd fl.**

Tutorial:
Demystifying Large Language Models and Generative Pretrained Transformer
  Won Kim, Gachon University, South Korea

15:00 – 15:30	**Morning Coffee Break**	**Lobby 3rd fl.**

15:30 – 17:00	**ABC (AI-Big Data Convergence) Forum**	**Aula Room – R.3.01, 3rd fl.**

Panel Discussion:
The Future of LLMs
Moderator
- *Stéphane Bressan, National University of Singapore, Singapore*

Panelists
- *Ngurah Agus Sanjaya ER, Udayana University, Indonesia*
- *Gabriele Kotsis, Johannes Kepler University Linz, Austria*
- *A Min Tjoa, Vienna University of Technology, Austria*
- *Dirk Draheim, Tallinn University of Technology, Estonia*

17:00 – 19:00	**Welcome Reception @ Central Park Udayana University**

Address: Gedung Pasca Sarjana (Postgraduate Building), Udayana University
Jalan P.B. Sudirman, Denpasar, Bali 80232

Program Details

08:00 – 09:00	**Registration**	**Lobby ground fl.**

09:00 – 10:00	**Plenary session**	**Aula Room – R.3.01, 3ʳᵈ fl.**

Keynote Talk II

The Android Platform Security Model (and the security status of actual devices)
- *René Mayrhofer, Johannes Kepler University Linz, Austria*

10:00 – 10:30	**Morning Coffee Break**	**Lobby 3ʳᵈ fl.**

10:30 – 12:00	**Parallel Session**	
	Track 1: iiWAS Session 3	**R.3.08 @3ʳᵈ fl.**

Deep & Machine Learning 1
- **Unsupervised Clustering and Explainable AI for Unveiling Behavioral Variations Across Time in Home-appliance Generated Data**
  Ramona Tolas, Raluca Portase, Camelia Lemnaru, Mihaela Dinsoreanu, Rodica Potolea
  Romania
- **A Deep Learning-Based Technique to Determine Various Stages of Alzheimer's Disease From 3D Brain MRI Images**
  Shamim Ripon, Tahzib-E-Alindo, Pranto Kubi, Anika Islam, Md. Amir Hozaifa Bin Zaher
  Bangladesh
- **Churn Prediction in Enterprises with High Customer Turnover**
  William Jones Beckhauser, Renato Fileto
  Brazil
- **Data Fusion Performance Prophecy: A Random Forest Revelation**
  Zhongmin Zhang, Shengli Wu
  China, UK

10:30 – 12:00	**Track 2: iiWAS Session 4**	**RK.2.05 @2ⁿᵈ fl.**

Generative AI
- **Generating Fine-Grained Aspect Names from Movie Review Sentences Using Generative Language Model**
  Tomohiro Ishii, Yoshiyuki Shoji, Takehiro Yamamoto, Hiroaki Ohshima, Sumio Fujita, Martin J. Duerst
  Japan
- **Reducing Human Effort in Keyphrase-Based Human-in-the-Loop Topic Models: A Method for Keyphrase Recommendations**
  Muhammad Haseeb UR Rehman Khan, Kei Wakabayashi
  Japan
- **Movie Keyword Search Using Large-Scale Language Model with User-Generated Rankings and Reviews**
  Tensho Miyashita, Yoshiyuki Shoji, Sumio Fujita, Martin J. Duerst
  Japan
- **Extraction News Components Methods for Fake News Correction**
  Masaya Sueyoshi, Akiyo Nadamoto
  Japan

10:30 − 12:00 **Track 3: MoMM session 2**   **R.3.09 @3rd fl.**
Mobile Computing and Wireless Sensors

- **Does Use of Blink Interface Affect Number of Blinks When Reading Paper Books?**
  Junpei Uchida, Tsutomu Terada, Masahiko Tsukamoto
  Japan
- **A Method for Stimuli Control of Carbonated Beverages by Estimating and Reducing Car bonation Level**
  Yusuke Miyajima, Tsutomu Terada, Masahiko Tsukamoto
  Japan
- **A Knee Injury Prevention System by Continuous Knee Angle Recognition using Stretch Sensors**
  Ayumi Ohnishi, Kota Kirinoe, Tsutomu Terada, Masahiko Tsukamoto
  Japan
- **Ubiquitous Mobile Application for Conducting Occupational Therapy in Children with ADHD**
  Jonnathan Berrezueta-Guzman, Melissa Montalvo, Stephan Krusche
  Germany, Ecuador

12:00 − 13:00 **Lunch**   **Lobby 3rd fl.**

13:00 − 14:30 **Parallel Session**
Track 1: iiWAS Session 5   **R.3.08 @3rd fl.**
Image Data & Knowledge Graph I

- **Buy Eye-mask Instead of Alarm Clock!: Graph-based Approach to Identify Functionally Equal Alternative Products**
  Tsukasa Hirano, Yoshiyuki Shoji, Takehiro Yamamoto, Martin J Duerst
  Japan
- **Automatic Hypotheses Testing Over Heterogeneous Biological Databases using Open Knowledge Networks**
  Hasan Jamil, Stephen Krawetz, Alexander Gow
  USA
- **Provenance-Aware Data Integration and Summarization Querying for Knowledge Graphs**
  Pei-Yu Hou, Jing Ao, Kara Schatz, Alexey V. Gulyuk, Yaroslava G. Yingling, Rada Chirkova
  USA
- **Integration of Knowledge Bases and External Information Sources via Magic Properties and Query-driven Entity Linking**
  Yuuki Ohmori, Hiroyuki Kitagawa, Toshiyuki Amagasa, Akiyoshi Matono
  Japan

13:00 − 14:30 **Track 2: iiWAS Session 6**   **RK.2.05 @2nd fl.**
Similarity Measure & Metric I

- **The Actualization of TikTok Affordances to Challenge Female Unrealistic Standards of Beauty**
  Saffiya Ebrahim, Maureen Tanner
  South Africa
- **Novel Blocking Techniques and Distance Metrics for Record Linkage**
  Nachiket Deo, Sanguthevar Rajasekaran, Joyanta Basak, Ahmed Soliman, Daniel Weinberg, Rebecca Steorts
  USA
- **Efficiently discovering spatial prevalent co-location patterns without distance thresholds**
  Vanha Tran, Duyhai Tran, Anhthang Le, Trongnguyen Ha
  Vietnam

• **Boosting Similar Compounds Searches via Correlated Subgraph Analysis**
Yuma Naoi, Hiroaki Shiokawa
Japan

13:00 − 14:30 **Track 3: MoMM session 3**   **R.3.09 @3rd fl.**
Image and video processing
• **Implementation of a Video Game controlled by Pressing the Upper Arm using PPG Sensor**
Kazuki Yoshida, Goro Mizuno, Naoki Kurata, Kazuya Murao
Japan
• **Face to Face with Efficiency: Real-Time Face Recognition Pipelines on Embedded Devices**
Philipp Hofer, Michael Roland, Philipp Schwarz, René Mayrhofer
Austria
• **Multi-camera Live Video Streaming over Wireless Network**
Takashi Koyama, Yusuke Gotoh
Japan
• **Effects of Deep Generative AutoEncoder Based Image Compression on Face Attribute Recognition: A Comprehensive Study**
Ahmed Baha Ben Jmaa, Dorsaf Sebai
France

14:30 − 15:00 **Afternoon Coffee Break**   **Lobby 3rd fl.**

15:00 − 16:00 **Parallel Session**
Track 1: iiWAS Session 7   **R.3.08 @3rd fl.**
Business Data & Application II
• **A Label Aggregation Method using Worker Quality in Crowdsourcing**
Nana Oota, Yu Suzuki
Japan
• **ImputAnom: Anomaly Detection Framework using Imputation Methods for Univariate Time Series**
Tirana Noor Fatyanosa, Mahendra Data, Neni Alya Firdausanti, Israel Mendonca, Putu Hangga Nan Prayoga, Masayoshi Aritsugi
Indonesia, Japan
• **Smart Cities as Hubs: navigating the Smart City data provider's landscape**
Ioannis Nikolaou, Leonidas Anthopoulos
Greece

15:00 − 16:00 **Track 2: iiWAS Session 8**   **RK.2.05 @2nd fl.**
Topic and Text Matching I
• **A Machine Learning Approach to Enterprise Matchmaking Using Multilabel Text Classification Based on Semi-Structured Website Content**
Jan Vellmer, Peter Mandl, Tobias Bellmann, Maximilian Balluff, Manuel Weber, Alexander Doeschl, Max-Emanuel Keller
Germany
• **TraPM: A Framework for Online Pattern Matching over Trajectory Streams**
Rina Trisminingsih, Salman Ahmed Shaikh, Toshiyuki Amagasa, Hiroyuki Kitagawa, Akiyoshi Matono
Japan
• **Attention Based Stopword Generation for Neural Network based Text Processing**
Yuki Kuwabara, Yu Suzuki
Japan

| 15:00 – 16:00 | **Track 3: iiWAS session 9** | **R.3.09 @3rd fl.** |

Data Management II and Similarity Measure & Metric II

- **Efficient Similarity Searches for Multivariate Time Series: A Hash-based Approach**
  Yuma Yasuda, Hiroaki Shiokawa
  Japan
- **Character Entity Recognition using Hybrid Binary-Particle Swarm Optimization and Conditional Random Field on Balinese Folklore Text**
  I Made Satria Bimantara, Ngurah Agus Sanjaya ER, Diana Purwitasari
  Indonesia
- **Observing the patterns of correlation while drill-down**
  Sijo Arakkal Peious, Rahul Sharma, Minakshi Kaushik, Mehtab Shahin, Dirk Draheim
  Estonia

| 16:00 – 19:00 | **===== FREE TIME =====** |

| 19:00 – 21:30 | **Conference Dinner and Best Paper Award Presentation** |

Venue: Breeze Garden, Mercure Sanur Resort Bali
Jl. Mertasari, Sanur, South Denpasar, Bali
Note: *please bring the invitation card for admission. One invitation valid for one person*

Wednesday, 6 December 2023

| 08:00 – 09:00 | **Registration** | **Lobby ground fl.** |

| 09:00 – 10:30 | **Parallel Session** | |
| | **Track 1: iiWAS Session 10** | **R.3.08 @3rd fl.** |

Image Data & Knowledge Graph II

- **Enhancing Taxi Placement in Urban Areas using Dominating Set Algorithm with Node and Edge Weights**
  Sonia Khetarpaul, Dolly Sharma, Somya Ranjan, Saurabh Mishra
  India
- **Fast Correlated DNA Subsequence Search via Graph-based Representation**
  Ryuichi Yagi, Yuma Naoi, Hiroaki Shiokawa
  Japan
- **Efficient Maximum k-plex Search via Selective Branch-and-Bound**
  Shohei Matsugu, Hiroaki Shiokawa
  Japan
- **Deep image analysis for microalgae identification**
  Jeffrey Soar, Oh Shu Lih, Loh Hui Wen, Aletha Ward, Ekta Sharma, Ravinesh C. Deo, Prabal Datta Barua, Ru-San Tan, Eliezer Rinen, U Rajendra Acharya
  Australia, Singapore

| 09:00 – 10:30 | **Track 2: iiWAS Session 11** | **RK.2.05 @2nd fl.** |

Deep & Machine Learning II and Topic & Text Matching II

- **Celestial Machine Learning: Discovering the Planarity, Heliocentricity, and Orbital Equation of Mars with AI Feynman**
  Zi-Yu Khoo, Gokul Rajiv, Abel Yang, Jonathan Sze Choong Low, Stéphane Bressan
  Singapore
- **Deep Learning Based Emotion Recognition Using EEG Signal**
  Shamim Ripon, Tashfia Choudhury, Shabrina Akter Shara, Sharmin Sharkar Rima, Shaolin Zahan Aume
  Bangladesh

09:00 – 10:30
- **Digital Index Card Creation and Management for Memorizing What You See on the Web**
  Yuna Saka, Yoshiyuki Shoji, Hiroaki Ohshima, Kouzou Ohara
  Japan
- **Multitask, Cross-lingual Recipe Classification using Joint Fine-Tuning Mechanisms**
  Vlad-Andrei Negru, Camelia Lemnaru, Rodica Potolea
  Romania

09:00 – 10:30   **Track 3: iiWAS Session 12**   **R.3.09 @3rd fl.**
Recommendation Systems
- **Taste Representation Learning Toward Food Recommendation Balancing Curiosity and Comfort**
  Yuto Sakai, Qiang Ma
  Japan
- **Tag2Seq: Enhancing Session-based Recommender Systems with Tag-based LSTM**
  Yahya Bougteb, Elyazid Akachar, Brahim Ouhbi, Frikh Bouchra
  Morocco
- **ClinLearning: An Online Clinical Tutoring and Crowdsourced Treatment Recommendation System**
  Hasan Jamil, Tyler Bland, Evanthia Bernitsas, Nancy Car, Derrick Phillips, Farjahan Shawon, Berhane Seyoum, Alexander Gow
  USA
- **Using Derived Sequential Pattern Mining for E-Commerce Recommendations in Multiple Sources**
  Ritu Chaturvedi, Christie I. Ezeife, Md. Burhan Uddin
  Canada

10:30 – 11:00   **Morning Coffee break**   **Lobby 3rd fl.**

10:30 – 11:00   **Parallel Session**
Track 1: iiWAS Session 13   **R.3.08 @3rd fl.**
Business Data & Application III
- **Revolutionizing Real Estate: A Blockchain, NFT, and IPFS Multi-Platform Approach**
  Hung N. N., Khoa T. Dang, Triet M. N., Hong K. Vo, Bao Q. Tran, Khiem H. G., Phuc N. T., Hieu M. D., Loc V. C. P., Quy T. L., Anh N. T., Hien Q. N., Bang L. K., Nguyen D. P. T., Ngan N. T. K., Son X. H., Huong H. L.
  Vietnam
- **Analysing Online Review by Bank Employees: A Predictive Analytics Approach**
  Dominic Desmond Anil Abraham Emmanuel, James Tan Swee Chuan, Priyanka Gupta
  Singapore
- **Optimizing Visit Booking at CERN: A Drools-Based Approach**
  Alberto Cortina Eduarte, Cristian Schuszter, Jacome Costales Ballesteros, Jose Antonio Garcia Fuentes, Marcin Mazurek
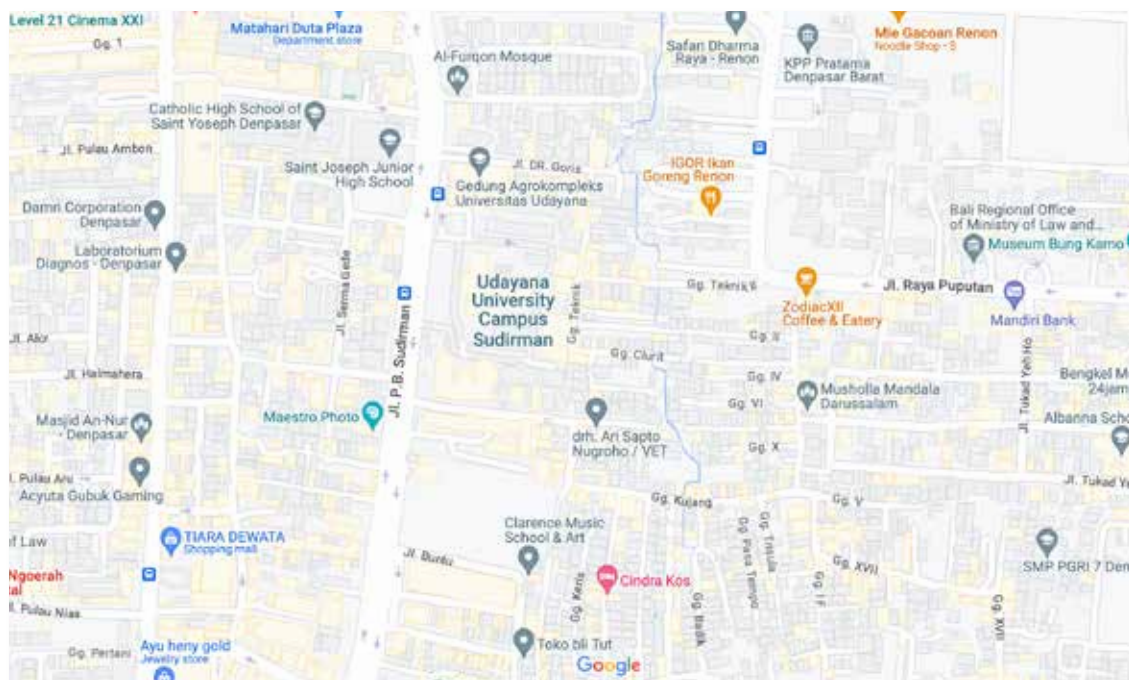 *Switzerland*

Program Details

13:30 – 15:00	**Track 3: MoMM session 4** **Security in mobile environments and Mobile Computing and** **Wireless Sensors and Image and video processing**	**R.3.09 @3rd fl.**

- **Federated Learning for Collaborative Cybersecurity of Distributed Healthcare**
  Svetlana Boudko
  Norway
- **Wearable Device Supporting Light/Dark Adaptation**
  Hiroki Sato, Ayumi Ohnishi, Tsutomu Terada, Masahiko Tsukamoto
  Japan
- **Immerscape: Supporting the creation of Immersive Soundscapes by users in Cultural Heritage contexts**
  Carolina Ferreira, Sofia Cavaco, Armanda Rodrigues, Nuno Correia
  Portugal

12:00 – 12:30	**Closing Session**	**Aula Room – R.3.01, 3rd fl.**
12:30 – 13:30	**Lunch**	**Lobby 3rd fl.**

The 25th International Conference on Information Integration and Web Intelligence
(iiWAS2023)
The 21st International Conference on Advances in Mobile Computing & Multimedia Intelligence
(MoMM2023)

4 - 6 December 2023, Denpasar - Bali, Indonesia

Conference Venue

iiWAS2023 and MoMM2023 takes place at the Postgraduate Faculty, Udayana University in Sudirman Campus Denpasar Bali

Address : P.B. Sudirman St. - Denpasar, Bali, Indonesia 80114
Phone : (0361) 223797
Email : pascasarjana@unud.ac.id
Website : https://pps.unud.ac.id/

A Brief about Udayana University

Udayana University

By a decision of the Directorate General of Higher Education, Ministry of Education and Culture of Indonesia, Udayana University (UNUD) was officially founded in August 17, 1962. Initially Unud consisted of four faculties: Letters, Medicine, Veterinary Sciences and Animal Husbandry and Education and Teacher Training. The Faculty of Letters was actually established on 29th September 1958, however, the time it was a subsidiary of the Faculty of Letters of Airlangga University in Surabaya (East Java). This Faculty was then integrated into Udayana University in 1962. Although it was founded on August 17, the anniversary date of Udayana University is not August 17, but was choosen to be on September 29 to commemorate the date of establishment of the Faculty of Letters in 1958. Unud has develop rapidly, in 2015 the university has 13 faculties (Faculty of Cultural Knowledge, Faculty Medic and Health Sciences, Faculty of Law, Faculty of Engineering, Faculty of Agriculture, Faculty of Economics and Business, Faculty of Animals Husbandry, Faculty of Math and Natural Sciences, Faculty of Veterinary Science, Faculty of Agricultural Technology, Faculty of Tourism, Faculty of Social and Political Sciences, Faculty of Marine Science and Fisheries), 25 master programs and 10 doctoral programs.

Udayana University today's is listed as one of the 50 "Promising Universities of Indonesia" published by the Ministry of Education of Republic Indonesia, out of nearly 2.500 higher education institutions around the country. The university has a strong position as one of the leading university particularly in the Eastern Indonesian Territory.

The Faculty of Engineering, Udayana University was officially established on October 1, 1965 with PTIP Ministerial Decree No. 248/Sek/P.U/1965, dated 20 October 1965, which consists of two departments, namely the Department of Architecture and the Department of Fine Arts. The background to the establishment of the Faculty of Engineering, Udayana University, was in the context of preserving and developing Balinese regional culture in particular and national culture in general, especially in dealing with tourism development and development. In line with existing developments, the Faculty of Engineering, Udayana University continues to improve and develop itself. To anticipate technological developments and society's demands for technical personnel.

Currently the Faculty of Engineering consists of 7 undergraduate programs (Architecture, Electrical Engineering, Civil Engineering, Mechanical Engineering, Information Technology, Industrial Engineering, Environmental Engineering), 5 postgraduate programs (Master of Architecture, Master of Electrical Engineering, Master of Civil Engineering, Master of Mechanical Engineering, Doctor of Engineering Sciences), and 2 international programs (Global Engineering Program, Tropical Engineering).

Social Events

Welcome Reception

Monday, 4 December 2023, 17:00 – 19:00 pm at Central Park, Udayana University Campus

After the last session of the first day finished, all participants are invited to a welcome reception which located in the garden just outside the building. The garden is called "Central Park" because it is the central of the campus area where the "pura" of the campus is located. This informal reception is an ice breaker for all participants to chill out and networking with peers while enjoying the evening with an acoustic music performance by the students of Undayana University. Some drinks & small foods will be served (p.s. Alcohol is not permitted in the campus)

Conference Dinner

Tuesday, 5 December 2023, 19:00 – 21:30, at the @ the Breeze Garden, Mercure Sanur Resort Bali, Jl. Mertasari, Sanur, South Denpasar, Bali

On the second day, iiWAS/MoMM 2023 invites all participants to the Conference Dinner which will be held at the Breeze Garden Restaurant located at Mercure Sanur Resort Bali on the side of Mertasari Beach Sanur. The best papers awards will also be presented to the selected papers. Bring along your shawl or light jacket as the sea wind might a bit chilly.

General Information

Registration Desk
The Registration Desk is located at the Lobby ground floor, Gedung Fakultas Pasca Sarjana (Postgraduate Faculty Building) Udayana University Sudirman Campus, Denpasar - Bali

Opening hours:
Mon &Tue, 4 & 5 Dec 2023; 08.00 – 16.00   Wed, 6 Dec 2023; 08.00 – 11.00

Coffee Breaks & Lunches
Coffee Break and Lunch will be served at the Lobby 3rd floor during the conference days.
Please always wear/bring your ID badge throughout the conference programs, coffee breaks and lunches.

Smoking Policy
Smoking only permitted in the restricted area and outside the building. No smoking inside the buildings.

Mobile Phone Courtesy
All mobile phones and other equipment with audible alarms should be turned off in all sessions as a courtesy to the presenters and to the other attendees.

Presentation Equipment
The conference organizer will provide a standard presentation equipment projector and flipchart. All presenters are recommended to bring their personal laptop for presentation including any adaptors required for the laptop, otherwise please inform the organizer earlier before presentation schedule.

WLAN Access
Free WiFi is available in the entire meeting rooms, please contact registration desk for WiFi connection.

Electricity Supply
Electricity in Austria is supplied at 220V. Please make sure to bring your own travel adapter if needed. We cannot guarantee the availability of the appropriate adaptor or transformer.

Public Transport in Denpasar Bali
Mass Public transport in Bali is not a popular mean of transport and it is not recommended for foreigners. Major transportation means are Taxi and E-hailing services/online taxi which can be car or motorbike.
Taxis are easily available around the island and most of them charge by meter, but some un-reliable taxis are not. Be sure to ask whether they use meter or not before boarding. **"Blue Bird"** taxi is most recommending taxi flag.
Grab is the most popular **e-hailing** services in Bali. Simply download the app (Grab or Gocar/Gojek) to start booking your trips. Payment is either by cash or credit/debit card.

Important:
Udayana University has two campuses which located in two different districts; one in Denpasar and another one in Bukit Jimbaran. iiWAS/MoMM 2023 conferences venue is **Udayana University (UNUD) campus Denpasar at Jalan Sudirman, Denpasar.** BE SURE to tell the Taxi or E-hailing/online taxi to go to the correct campus.

The 25th International Conference on Information Integration and Web Intelligence
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NOTES

iiWAS 2023   MoMM 2023