2nd 2025 KASEA Academic Presentations

- Date: 13th (Saturday) December 2025
- Time: 8:50 – 11:00 am (Sydney, Australia), (6:50-9:00am, Japan)
- Venue: Room 402, Civil Engineering Building (H20), UNSW Sydney, NSW
- Online link: **Join the meeting now**
  Meeting ID: 480 121 186 197 7
  Passcode: sk3w3yE6
- **Theme: AI, Computer Science and Information Technology**

Time	Speaker	Title
08:55 - 09:00	**Dr. Jun-Seok Bae** KASEA president	Greeting and Opening Speech
09:00 - 09:20	**Prof. Byeong Ho Kang** University of Tasmania	Beyond Principles: A Technical Blueprint for Safe AI Orchestration
09:20 - 09:35	**Dr. Minjune Kim** CSIRO Data61	CyberAlly: Leveraging LLMs and Knowledge Graphs to Empower Cyber Defenders
09:35 - 09:50	**Heemoon Yoon** AQ1System	Monitoring Bluefin Tuna using Machine Learning
09:50 - 10:10	**Dr. Mira Park** University of Tasmania	Automatic Detection of Amyloid Beta Plaques in Somatosensory Cortex of an Alzheimer's Disease Mouse using Deep Learning
10:10 - 10:40 (online)	**Prof. Jungpil Shin** University of Aizu, Japan	Vision and Sensor Based System for Human Activity Recognition using Machine Learning
10:40 – 11:00	**Morning tea**	

Prof. Byeong Ho Kang, University of Tasmania:

Bio: Dr. Byeong Ho Kang is a Professor in the School of ICT at the University of Tasmania, a position he has held since January 2000, following Head of the School from January 2018 to June 2021. He earned his Ph.D. in Computer Science and Engineering from the University of New South Wales in 1996, and a Bachelor's in Mathematics from Pusan National University in 1988. His career also includes roles as an Associate Professor in Kyung Hee University, South Korea, and a Research Fellow at HITACHI, Japan, in addition to consultancy and project management roles with various international companies.

A highly productive researcher, Dr. Kang has authored over 300 publications, peer reviewed journals/conferences and authored/edited books. His diverse research areas prominently include Artificial Intelligence (AI), with applications in health, advanced manufacturing and internet services. A significant focus is on data and knowledge management, particularly focusing on meta knowledge-based sharing frameworks and platforms. He has been instrumental in securing over 30 funded projects since 2015, collaborating with various government and industry partners in Australia, the US, Qatar and Korea, and has held significant leadership roles in academic AI communities.

Abstract: Artificial Intelligence (AI) is at a critical turning point. While recent progress in large language models (LLMs) and agentic systems brings major opportunities, it also introduces serious risks—such as system failure, lack of transparency, and ethical misalignment. Traditional approaches, including monolithic AGI architectures and today's generative AI systems, are often criticized for centralizing risk and being difficult to control or audit.

We propose a new approach called orchestrated intelligence. It offers a technical roadmap that addresses current challenges by shifting from abstract ideas to a machine-enforceable architecture. The framework is based on nine essential principles that ensure AI is developed in a safe, transparent, and trustworthy way. A key feature of the system is its two-layer structure, which separates governance (control plane) from execution (integration layer). This design helps localize risks and ensures all actions are traceable. Inspired by cognitive science and symbolic AI, the framework includes practical safeguards, such as symbolic gatekeeping, blockchain-based accountability, and human-in-the-loop (HITL) auditing.

We also emphasize the difference between the conceptual design of orchestrated AI and its technical implementation. By using current AI tools to build a meta-technology for coordination and oversight, we argue that the main risks of generative AI come from weak architecture—not from the technology itself.

In summary, the orchestration model redefines AI as a collaborative partner. It provides a clear path toward auditable, human-centered AI that aligns with societal values and can be developed responsibly.

Dr. Minjune Kim, CSIRO Data61:

Bio: Dr. Minjune Kim is a research engineer at CSIRO's Data61, Sydney, Australia. He holds a Ph.D. (2023) in computer science from The University of Queensland (UQ), Brisbane, Australia and a bachelor's degree (2006) in electrical engineering from Korea University, Seoul, South Korea. Before joining UQ, he had worked for Samsung Electronics Co., Ltd., Suwon, South Korea as a senior software engineer for over 12 years. I have developed an embedded system from scratch (IGNIS, 1000 thermal cameras for Korean firefighters in 2017), developed an Android app (Samsung Connect with over 500 million downloads) on Android, and contributed a location framework in TIZEN (1st Contributor). His research interests are (i) Moving Target Defence; (ii) Network Security; (iii) Human Centric Security; (iv) Security in Internet Of Things; and (v) Location-Based Services.

Abstract: The increasing frequency and sophistication of cyberattacks demand innovative approaches to strengthen defence capabilities. Training on live infrastructure poses significant risks to organizations, making secure, isolated cyber ranges an essential tool for conducting Red vs. Blue Team training events. These events enable security teams to refine their skills without impacting operational environments. While such training provides a strong foundation, the ever-evolving nature of cyber threats necessitates additional support for effective defence. To address this challenge, we introduce CyberAlly, a knowledge graph-enhanced AI assistant designed to enhance the efficiency and effectiveness of Blue Teams during incident response. Integrated into our cyber range alongside an open-source SIEM platform, CyberAlly monitors alerts, tracks Blue Team actions, and suggests tailored mitigation recommendations based on insights from prior Red vs. Blue Team exercises. This demonstration highlights the feasibility and impact of CyberAlly in augmenting incident response and equipping defenders to tackle evolving threats with greater precision and confidence.

Heemoon Yoon, AQ1Systems:

Bio: Mr. Heemoon Yoon received the B.S. degree in computer science and engineering from Soongsil University, Seoul, South Korea, in 2019, and the M.S. degree in information and communication technology from the University of Tasmania, in 2020. He is currently working in the machine learning and data science R&D department, AQ1Systems. His research interests include artificial intelligent and image processing.

Abstract: The live Bluefin Tuna (BFT) fishery monitoring process relies extensively on underwater video documentation of transfer and caging operations using stereoscopic and conventional camera systems. Manual review of extensive video datasets from fishing campaigns presents significant operational challenges, including substantial time requirements, human error susceptibility, and delayed information delivery that impacts fish survival rates and operational efficiency.

This study evaluated artificial intelligence implementation for automated BFT transfer and caging video analysis across multiple operational scenarios, including initial transfers, subsequent transfers, caging procedures, control transfers, and carry-over operations. The deployed AI system utilized advanced machine learning algorithms to automate fish counting and size measurement processes.

Performance evaluation demonstrated high accuracy in length measurements, with AI-derived caudal fork length distributions showing mean deviations of 3.59 cm (± 4.30) per transfer compared to manual measurements, representing 1.82% difference in mean length calculations. Fish counting accuracy achieved 92.2% concordance with manual counting methodologies. Processing efficiency improvements were substantial, with AI systems demonstrating up to 74-fold speed increases over manual analysis methods, averaging 30-fold reduction in analysis time requirements.

The results indicate AI-based automated video analysis systems can effectively replace manual monitoring processes while maintaining measurement accuracy and delivering significant operational efficiency gains for BFT fishery management.

Dr. Mira Park, University of Tasmania:

Bio: Dr Mira Park is a Lecturer in the School of Information and Communication Technology at the University of Tasmania, Australia. She previously held research fellow positions at the University of Melbourne and the University of Newcastle. Her research expertise spans image processing, computer vision, and deep learning. Dr Park has authored over 60 peer-reviewed publications, which have collectively received more than 1,000 citations. She has been the recipient of multiple research grants, securing over $1 million in funding across her academic appointments. Her interdisciplinary research has contributed to advancements in medical imaging for computer-aided diagnosis, as well as intelligent vision systems powered by artificial intelligence and computer vision technologies.

Abstract: Accurate identification and quantification of amyloid beta (Aβ) plaques in the cerebral cortex is essential for advancing therapeutic research in Alzheimer's Disease (AD). This study presents a novel deep learning-based framework for automated measurement of Aβ plaques within anatomically segmented cortical regions. The proposed pipeline comprises three key stages: (1) Data Acquisition and Preprocessing, which includes image enhancement and normalisation via a custom plaque removal algorithm; (2) Atlas Development, involving anatomical segmentation using a trained deep neural network (DNN); and (3) Quantitative Analysis, where Aβ plaque burden is assessed within the segmented regions. A dataset of 946 annotated mouse brain sections exhibiting Aβ plaque labelling was used to train and evaluate five DNN architectures: FCN32, FCN16, FCN8, SegNet, and U-Net. Among these, U-Net demonstrated superior performance, achieving an atlas segmentation accuracy of 83.98% and a Dice coefficient of 91.21% on the test set. The framework enabled automated segmentation of the somatosensory cortex and precise quantification of Aβ plaque intensity and distribution. This work contributes to the field of computational neuroscience by enabling region-specific, high-throughput analysis of histological images using deep learning, thereby facilitating scalable and reproducible assessment of pathological features in AD models.

Prof. Jungpil Shin, University of Aizu, Japan:

Bio: JUNGPIL SHIN (Senior Member, IEEE) received the B.Sc. degree in computer science and statistics and the M.Sc. degree in computer science from Pusan National University, South Korea, in 1990 and 1994, respectively, and the Ph.D. degree in computer science and communication engineering from Kyushu University, Japan, in 1999, under a scholarship from the Japanese Government (MEXT). He was an Associate Professor, a Senior Associate Professor, and a Full Professor with the School of Computer Science and Engineering, The University of Aizu, Japan, in 1999, 2004, and 2019, respectively. He has co-authored more than 490 published papers for widely cited journals and conferences. His research interests include pattern recognition, image processing, computer vision, machine learning, human–computer interaction, non-touch interfaces, human gesture recognition, automatic control, Parkinson's disease diagnosis, ADHD diagnosis, user authentication, machine intelligence, bioinformatics, and handwriting analysis, recognition, and synthesis. He is a member of ACM, IEICE, IPSJ, KISS, and KIPS. He serves as an Editorial Board Member for Scientific Reports. He was included among the top 2% of scientists worldwide edition of Stanford University/Elsevier, in 2024, and the top 0.5% of AI researcher worldwide edition of ScholarGPS, in 2024. He served as the general chair, the program chair, and a committee member for numerous international conferences. He serves as an Editor for IEEE journals, Springer, Sage, Taylor & Francis, Sensors (MDPI), Electronics (MDPI), and Tech Science. He serves as a reviewer for several major IEEE and SCI journals.

Abstract: My lifelong vision is to create an information society where communication is seamless and grounded in mutual trust. This vision began during my university studies in pattern recognition, leading me to focus on biometric verification and identification systems. Over the years, I have developed innovative algorithms for recognition, verification, and synthesis, making significant contributions to pen computing, including stroke-order-free character recognition for Japanese and Korean scripts, 3D virtual brush simulation, signature verification, handwriting font generation, and Kanji learning systems. Leveraging dynamic programming, segmentation, and advanced image processing techniques, I extended this research to digital image processing, gesture recognition, and content-based retrieval using sensors like Kinect, Leap Motion, and smart devices. In Human-Computer Interaction (HCI) and Natural User Interfaces (NUI), I have pioneered gesture recognition algorithms using CNNs, RNNs, Graph Convolutional Networks, and multi-head attention mechanisms. These innovations enable intuitive, non-touch input systems, improving accessibility and usability. Channel attention and residual connections further enhance feature extraction and model stability, laying the groundwork for robust real-time interaction systems. Currently, my research emphasizes integrating AI-driven sensing with healthcare, bridging advanced computing and clinical applications. Projects include:

1. Movement Disorder Detection: Analyzing handwriting and motion data to diagnose Parkinson's disease with over 95% accuracy.

2. Alzheimer's Detection: A dual-stream deep learning framework using MRI scans and Haar wavelet transforms achieves 99.05% accuracy in early-stage diagnosis.

3. ADHD/ASD Identification: Multimodal approaches combining handwriting analysis and fNIRs signals provide non-invasive, objective screening, achieving over 93% accuracy.

4. Fall and Abnormality Analysis: Machine learning-based assessment of fall risks, abnormal movement patterns, and physical fitness.

Through these efforts, research team is building integrated, real-time diagnostic systems combining handwriting, motion, and brain imaging data with machine and deep learning. This research not only advances intelligent interfaces and pattern recognition but also addresses pressing healthcare challenges, demonstrating the transformative potential of AI in medicine.

Access to the venue

Date: Saturday, 13 December
Time: 8:50 AM – 11:00 AM
Location: Room 402, Civil Engineering Building (H20), UNSW Sydney, NSW
Campus Map: UNSW Interactive Map
Getting Here: Directions to UNSW
Getting to UNSW

- **By public transport (recommended option):** Take the **L2 Randwick Line** light rail from the CBD or Central Station and get off at **UNSW High Street Station**. *Other public transport options are also available—please refer to the UNSW travel information link above for details.*
- **By car:** Use the **Botany Street Parking Station** (access via Gate 11, Botany Street). Parking is **free on Saturdays**.
- **Building access:** Call Taehwan Kim (taehwan.kim@unsw.edu.au) upon arrival, as the building entrance remains locked on weekends.

Lunch (Optional): 1:30 pm to 3:00 pm
After the session, we will have lunch at **Chao Praya Thai Restaurant** in *The Spot, Randwick* (approximately 15 minutes' walk). Restaurant website