The IEEE ProComm Japan 2025 Workshop

Date & Time: December 15, 2025 (Monday) 19:00~21:00 (Japan Standard Time)

Free Online Event

Workshop Schedule:

19:00-19:05 (JST) Opening Remarks

Kayoko H. Murakami (Shibaura Institute of Technology)

Chair, IEEE PCS Japan Chapter

19:05-19:45 (JST): Keynote Talk

Prof. Akihiko Shirai, PhD (AICU Inc., Digital Hollywood University Graduate School)

Tentative Title: Creative AI in Education

Bio: https://akihiko.shirai.as/

Photo: https://gallery.shirai.as/

19:55-20:55 (JST): Presentations (3 Parallel Sessions: Breakout rooms A, B, & C)

SESSION A: Technologies & Communication 1

1. Curriculum Innovations for Developing Students' AI Literacies and Academic Literacies in Japanese Higher Education

   Tingjia Wang (Hiroshima University)

   Abstract: This presentation aims to report preliminary findings in a newly launched curriculum called Technology-enhanced Research Writing in a national university in Japan. The innovative curriculum was adapted from a traditional English academic writing curriculum as a direct response to the increasing use of GenAI in students' English research writing in Japanese higher education. Alongside the increasing use of GenAI in students' writing, students and faculties raised high demands for more academic supports in the development of AI literacy. The new curriculum develops student-centered, problem-based learning to prompt students' critical reflection on: (a) their own human writing, (b) their learning needs in GenAI experiences (e.g., Why and when do they typically need GenAI to assist their writing? On which level of the language do they need GenAI's suggestions?, etc.), and (c) the effectiveness of GenAI's language suggestions. This presentation will first introduce the latest attitude and concerns towards GenAI in Japanese higher education, then describe the innovative curriculum design, and then report the preliminary observation of student-GenAI interactivity in the course. This presentation will provide insights for deepening the understanding of student-GenAI interactions and discuss pedagogical innovations for teachers to better monitor students' ethical use of GenAI in their English research writing.

2. Investigation into the Effect of Olfactory Stimulation on Reducing VR Sickness: The Use of 360-Degree Virtual Tourism Videos for the Elderly and the Role of Scents

   Ren Adachi, Kayoko H. Murakami (Shibaura Institute of Technology), Atsuko K. Yamazaki (Digital Hollywood University Graduate School), Adilin Anuardi (Hiroshima University), Wei Liu (Shibaura Institute of Technology)

   Abstract: This study examined the efficacy of olfactory stimulation as a mitigation strategy for VR sickness

in VR tourism, based on an experiment with five elderly participants. VR content serves as an effective tool for expanding tourism opportunities for individuals, including the elderly, with physical or temporal constraints. However, VR sickness, caused by the mismatch between visual and other sensory information, remains a key challenge to its widespread adoption. We introduced scent stimuli as a non-invasive mitigation method, independent of hardware performance. Five elderly participants viewed a 4-minute VR video, with intermittent exposure to a no-scent condition or four scents (Hinoki, Peppermint, Grapefruit, and Lavender). Sufficient 5-minute rest intervals were provided to prevent olfactory adaptation. NIRS brain activity measurements suggested that Hinoki and Grapefruit promoted greater brain activation compared to the no-scent condition. Furthermore, questionnaire data confirmed a perceived insufficiency of multi-sensory input compared to real-world experiences and a stress tendency toward scents incongruent with the visual content.

3. A Hybrid Computational Model for Interpreting Emotional Communication in Music Through Lyrics and Rhythmic Signals

Nur Ezurin Farisha binti Jusshairi, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

Abstract: Music has a profound impact on human emotions, making it a universal language that enhancing user experiences in applications such as personalized music recommendations and emotional well-being. Traditional approaches often focus on either lyrical or rhythmic components in isolation, leading to fragmented analyses. This research introduces a Hybrid Model for Music Emotion Recognition (HMMER) that integrates lyric sentiment analysis and rhythm-based emotion detection to address these challenges. The model leverages artificial intelligence, employing a Multi-Layer Perceptron (MLP) neural network trained on TF-IDF vectors for lyric analysis and another MLP model combined with Linear Discriminant Analysis (LDA) for rhythm-based emotion detection. Achieving accuracies of 87% and 85% for lyrics and rhythm analysis, respectively, the system provides robust emotion recognition. Additionally, a weighted hybrid approach using 60% lyrics and 40% rhythm enhances predictive accuracy and enables personalized music recommendations. This research contributes to advancing music emotion analysis by offering a comprehensive and user-friendly solution for improving emotional well-being and music personalization. This research advances the interpretation of emotional communication in music within digital and intelligent systems. The proposed model enhances user-centered interaction by generating more precise emotional insights that support personalization, adaptive responses, and context-aware decision making in music applications.

4. CrowdTune: A Real-Time Multimodal Emotion Intelligence System Using Behavioral and Visual Cues

Hariz Bin Ahmad Fauzi, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

Abstract: CrowdTune is a real-time multimodal visual emotion intelligence system designed to improve audience engagement, safety protocols and stage experience. The system captures a live video feed of crowds and analyzes individual faces to generate a unified, quantifiable collective mood profile. The camera incorporates Facial Emotion Recognition (FER) technology with Convolutional Neural Network (CNN) to classify emotions into standard categories such as happy, sad, fear and anger. The crowd aggregation module computes overall crowd emotion using Weighted Dominance Model, which is visualized on a dynamic dashboard with live charts and mood indicators to provide actionable insights for event organizers and security personnel. The system architecture consists of four integrated modules which includes a camera feed to capture live video, a FER framework to detect and classify individual faces, a crowd aggregation to compute the collective emotion and a visualization dashboard to display graphs and indicators. These modules function together to provide a cohesive, real-time understanding of collective psychological behavior during live events. By integrating FER, visual analysis and crowd aggregation, CrowdTune offers the foundation to support emotion-driven event optimization and personalization. This system will define how nonverbal intelligence in entertainment and tourism can guide event organizers and security personnel to facilitate data-driven decision making, improve audience engagement and enhance situational safety for an immersive event experience.

5. Digital Learning Preferences of Gen Z Saudi EFL Learners and Their Role in Achieving Quality Education (SDG 4)

Imanat Ali (Majmaah University), Zuraina Ali (Universiti Malaysia Pahang Al-Sultan Abdullah)

Abstract: Artificial Intelligence (AI) is reshaping educational environment, particularly for Generation Z (Gen Z) learners in Saudi Arabia, a generation deeply immersed in technology and driven by innovation,

interactivity, and personalization. This study investigates the impact of AI-powered tools such as ChatGPT, padlet, and google docs on English as a Foreign Language (EFL) learning among Saudi Gen Z students. Grounded in the principles of the United Nations Sustainable Development Goal 4 (SDG 4), which advocates for inclusive and equitable quality education as well as Majmaah University quality education goal. The research examines how AI-assisted learning enhances student engagement, autonomy, and linguistic proficiency. Employing a mixed-methods design, the study gathers quantitative data through student surveys and qualitative insights from semi-structured interviews with EFL instructors. The anticipated results aim to reveal the extent to which AI tools facilitate individualized learning, motivation, and language development, while addressing pedagogical challenges such as technological dependency and data privacy issues. By aligning AI integration with SDG 4 objectives particularly fostering digital literacy, promoting equal access, and developing 21st-century competencies. The study offers evidence-based recommendations for policymakers, educators, and curriculum designers. Ultimately, it seeks to advance the reimagining of English language education in Saudi Arabia to better serve the evolving needs of Gen Z learners in an increasingly interconnected world.

SESSION B: Technologies & Communication 2

1. Prospects for Integrating Nostalgia Tourism and Metaverse Technologies to Promote Regional Tourism

   Wei Liu, Kayoko H. Murakami (Shibaura Institute of Technology), Atsuko K. Yamazaki (Digital Hollywood University Graduate School), Adilin Anuardi (Hiroshima University)

   Abstract: Japan is currently experiencing severe population decline and aging, with the Tokyo metropolitan area continuing to absorb residents from surrounding regions. This ongoing concentration has accelerated depopulation and economic stagnation in many nearby towns. As a result, tourism has emerged as a crucial approach for revitalizing regional economies, particularly with the growing popularity of nostalgia tourism. A representative example is Bungotakada City, which has drawn significant attention through attractions such as the “Showa Town.” This study explores how the expanding integration of Virtual Reality (VR) and Augmented Reality (AR) technology can strengthen the promotion of nostalgia tourism destinations and increase tourists’ travel intentions. By proposing a conceptual framework that incorporates these three stages of nostalgia tourism, this research seeks to enhance domestic and international tourists’ motivation to engage with nostalgic travel in Japan, promote traditional Japanese culture, and support regional tourism revitalization. The framework was developed through a review of previous studies as well as interviews with local tourism bureaus.

2. Analyzing Tourist Behavior and Identifying Challenges in Gotemba City Using Online Reviews and Human Mobility Data

   Ryosuke Inada (Shibaura Institute of Technology), Axel Sulmont (Centre des Etudes Superieures Industrielles), Kayoko H. Murakami, Shintaro Fujita, Kaede Fujita (Shibaura Institute of Technology)

   Abstract: Gotemba City in Shizuoka Prefecture, the subject of this study, is a city characterized by its proximity to Mount Fuji. It boasts diverse tourist attractions and various facilities such as Premium Outlets and Tokinosumika. It is one of the prefecture's leading tourist cities. Gotemba City has two problems. One of them is the concentration of tourists at Gotemba Premium Outlets. Another one is the short average length of stay. This study aimed to obtain foundational documents for addressing these challenges by analyzing review data and Human Mobility data. Review data was collected from TripAdvisor and Jalan. KH Coder was used for text mining. Analysis by travel companion type and destination, along with a comparison of the two sites, extracted destination-specific characteristics and challenges. Furthermore, Human Mobility was visualized on maps using ArcGIS to clarify tourist behavior patterns. These results provide foundational insights for promoting circulation within Gotemba City and diversifying the utilization of its tourism resources.

3. Visual Display Colour Effects on Brain Activation: A Pre-study Using a Fill-in-the-Blank Calculation Task

   Shogo Murakami, Adilin Anuardi, Takahiro Sumiya (Hiroshima University), Atsuko K. Yamazaki (Digital Hollywood University Graduate School), Kayoko H. Murakami (Shibaura Institute of Technology)

   Abstract: As tablet devices become increasingly widespread, opportunities for older adults to use digital

technology are growing. However, operating these devices can impose cognitive load, and display settings such as background and text color may influence cognitive function. In this study, we used a fill-in-the-blank arithmetic task to examine the effects of background and text color combinations on cognitive processing. As a preliminary investigation, seven young adults performed the task under eight different conditions, and near-infrared spectroscopy (NIRS) was used to measure hemodynamic responses in their prefrontal cortex. The results showed lower brain activation in conditions featuring white text, particularly against a black background, where the effect was most notable. On the other hand, brain activation increased under the white background conditions, with the strongest response observed with the blue text combination. Despite these neural differences, no significant differences in task accuracy were found across conditions. Overall, these findings suggest that display settings, particularly the combination of background and text color, may substantially influence cognitive function in daily technology use. Building on these results, the main experiment will involve older adults to further examine how different display settings affect their cognitive responses.

4. AirChef: Intelligent Hands-Free Kitchen Assistant

   Syamshul Aleeya Batrisya Binti Shamshul Amree, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

   Abstract: Modern kitchen environments have increased the reliability of digital tools, yet many cooking processes still depend completely on manual interactions that interrupt the workflow, reduce hygiene and create barriers for users that require hands-free support. These challenges highlight the broader communication issues between human and smart devices which include how the instruction, feedback and interaction can occur seamlessly in a fast-paced and multitasking environment. To address these problems, the project introduces AirChef: Intelligent Hands-Free Kitchen Assistant, an AI-driven system that is designed to enhance the cooking experiences through intuitive and contact-free communication channels. The system integrated with computer vision, machine learning and natural language processing to interpret user gestures and spoken commands, enabling the user to control cooking steps, access recipe guidance and receive personalized recipe suggestions without touching any surface. By transforming movement and speech into a meaningful system, AirChef: Intelligent Hands-Free Kitchen Assistant is an evolution in technical and digital communication where the information exchange occurs through multimodal and natural interactions rather than traditional interfaces. The system is also designed to be culturally adaptable, acknowledging the cooking style, ingredients used and communication preferences which can vary across regions and communities. The expected outcome is a system that is smarter, hygienic, high adaptability and more inclusive, where the cooking environment demonstrates how innovative communication technologies can improve everyday tasks and strengthen human-technology collaboration in diverse contexts.

5. AirCanvas: A Multimodal Gesture and Voice-Enabled Interactive Drawing System for Enhanced Smart Classroom Engagement

   Zaki Adib Bin Abdurrahman, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

   Abstract: AirCanvas is a multimodal, touchless drawing system designed to enhance teaching interaction for kindergarten and primary school environments. The system allows educators to draw simple shapes in mid-air using hand gestures, which are captured by a standard webcam and translated into digital drawings in real time. This project integrates computer vision technology using hand-tracking models from MediaPipe to detect fingertip positions, stroke paths and gesture-based actions. In addition to gesture recognition, the system incorporates voice command processing through a speech recognition engine, enabling teachers to verbally resize shapes or convert 2D sketches into basic 3D forms. The combination of gesture-based drawing and voice-controlled transformation aims to help teachers create engaging visual explanations without touching a whiteboard, pen or touchscreen device. This hands-free interaction supports more dynamic movement during lessons and encourages student focus through interactive visualisation. The system architecture includes three core modules which are gesture detection, voice command recognition and visual display, all integrated to produce a user-friendly and low-cost tool suitable for standard classroom setups. By utilising accessible AI-driven technologies, AirCanvas demonstrates how computer vision and speech recognition can be applied to support creative teaching practices. The project ultimately aims to provide a practical educational innovation that improves classroom engagement, reduces teaching limitations and introduces young students to interactive digital learning experiences.

SESSION C: Technologies & Communication 3

1. AR-Based Storytelling for the Revival of Rural Tourism in Gotemba

   Viktoria Paschinger, Martin Hasitschka (University of Applied Sciences

Technikum Wien), Kayoko H. Murakami (Shibaura Institute of Technology)

Abstract: Rural destinations often struggle to attract visitors and do not have the financial resources for large scale infrastructure or new attractions. Research shows that tourists frequently choose rural areas to experience nostalgia, yet this emotional driver is rarely used strategically. Augmented reality is well accepted in tourism and can increase engagement and revisit intention. Storytelling strengthens attention and emotional connection, suggesting that AR based narratives may offer a low cost way to enhance rural experiences. This project proposes the development of a lightweight AR storytelling prototype that brings local narratives to life at historical or cultural sites, using Gotemba City in Japan as an example. The system architecture will be designed so that municipalities can adapt the application to additional sites. AI will support the creation of visual and narrative content, reducing the manual effort required for producing story based AR experiences. A questionnaire and a later user study will examine whether tourists respond positively to visual and interactive AR content and whether such experiences increase nostalgia and intention to visit compared to a non AR control condition.

2. Conditions for Sino-Japanese Code-Switching in Conversations among Chinese Residents in Japan

Dayu Wu, Mayu Shintani (Shibaura Institute of Technology)

Abstract: This study investigates Japanese–Chinese code-switching (CS) among Chinese residents in Japan by integrating linguistic patterns with individual and psychological factors. Following the post-COVID recovery in international student mobility, Chinese students now represent the largest share of foreign students in Japan, creating numerous settings where Japanese and Chinese are used side by side. While CS—bilingual speakers alternating between two language systems within a single utterance—is widely observed in daily interactions, quantitative research connecting CS behavior with psychological states remains limited. Drawing on previous work by Gumperz (1982), Moriizumi and Hu (2020), and Li Min (2017), this study addresses three gaps: (1) the lack of research focusing specifically on Japanese–Chinese CS, (2) the absence of quantitative measures of identity-related factors, and (3) the limited application of data-driven analytical methods. Twenty Chinese participants with study-abroad experience in Japan complete questionnaires measuring Japanese proficiency, intercultural sensitivity, cultural identity, self-esteem, perceived discrimination, satisfaction, and attitudes toward Japan and China. Paired conversations on daily topics are recorded to extract CS features. Using data mining techniques, the study aims to model how linguistic choices correspond to psychological variables and individual attributes. The expected outcome is a set of CS–psychological profiles that reveal how bilingual speakers strategically employ CS to express identity, negotiate social positioning, and adapt to intercultural workplace environments.

3. NOVA ONE: "Where Gesture Meets Intelligence"

Tuan Hanis Naisha Binti Tuan Zaimi, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

Abstract: NOVA ONE introduces a new paradigm for digital interaction by combining gesture recognition and natural voice communication in a single intelligent assistant. Designed to operate without a mouse or keyboard, it translates human motion into precise control actions and interprets spoken language to execute commands with high accuracy. From navigating the desktop to launching productivity tools and handling online meetings, NOVA ONE responds fluidly to both physical and verbal input. Its capabilities extend beyond utility: the system adapts to user emotion, retains contextual memory, and delivers responses with warmth and empathy. Built on an advanced, reasoning-driven AI architecture, NOVA ONE conducts web searches, manages communication, and multitasks across threads in the background. By bridging human behavior and artificial intelligence in a unified experience, NOVA ONE represents a significant step toward more natural, intuitive, and emotionally aware human-computer interaction.

4. Can Practicing in Metaverse Improve Speaking Accuracy and Fluency Using Virtual Reality Enhanced Task-Based Language Learning and Teaching?

Wan Noor Farah Wan Shamsuddin, Nik Aloesnita Nik Mohd Alwi, Umi Kalsom Masrom (Universiti Malaysia Pahang Al-Sultan Abdullah)

Abstract: This study examines the impact of incorporating virtual reality (VR) into task-based language learning and teaching (TBLT) classrooms by focusing on two key components of language production: fluency and accuracy. It does so by evaluating the effectiveness of a VR application called /spiːɤ/, which was designed around a mock job interview scenario that replicates an authentic Malaysian interview setting. A total of 93 students participated in the study which were divided into experimental and control groups. There measures were used to assess fluency which are on participants' number of words per minute, number of filled pauses, and speech rate. Accuracy, on the other hand, is measured based on

percentage of error-free clauses, number of self-corrections, and number of errors per 100 words. The measures were analysed before and after the three sessions of using /spi:x/. Then, paired samples t-tests were computed to see the significant difference of the treatments. The findings revealed that participants who completed three VR treatments produced more accurate and fluent language compared to the non-VR group. The findings indicate strong potential for using virtual reality to enhance language production, especially in speaking tasks.

5. The Banshees of Sintok

Ahmad Afzat Bin Azlan, Mohamad Sabri Bin Sinal @ Zainal (Universiti Utara Malaysia)

Abstract: The Banshees of Sintok is a 2D narrative-based horror game that is currently being developed to explore how interactive digital media can be used to communicate cultural stories while also supporting the promotion of a specific region as a potential tourism spot. The game draws from Malaysian folklore and uses real locations around Universiti Utara Malaysia (UUM), with the intention of turning the campus into an engaging narrative space. Through this approach, players are encouraged to experience local myths through atmosphere, exploration, and story elements built into the game world. The development focuses on visual tension, environmental clues, and resource-limited mechanics, for example the restricted torchlight battery, to help present cultural narratives in a way that feels more emotional and approachable. An AI-based enemy is also being introduced to make the experience less predictable and to create a stronger sense of suspense tied to the folklore themes. More than a form of entertainment, this project suggests how games can become a cultural meeting point and offer UUM a new way to position itself as a digital tourism destination. By exploring the in-game environment, players are exposed to local stories and traditions that may not be highlighted through conventional promotional methods. Overall, this work shows how serious games can support cultural preservation, tourism communication, and regional branding, and how Malaysian identity can be shared with a wider audience through interactive play.

20:55-21:00 (JST): Closing

Adilin Anuardi (Hiroshima University)

Treasurer, IEEE PCS Japan Chapter

To participate in the Workshop, please register at:

https://forms.gle/DsRFPG648ozhAc1m7

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