The 19th International Conference on Computer Science & Education

(ICCSE 2025)

Aug. 19-24, 2025

Osaka&Fukui, Japan

Final Program & Book of Abstracts

ICCSE 2025 is

Organized by

Computer Education Research Association of Chinese Universities (CERA-CU)

Hosted by

University of Fukui, Japan

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ICCSE 2025

The 19th International Conference on Computer Science and Education

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Welcome to ICCSE

It is with great pleasure and deep appreciation that I welcome all of you to the **19th International Conference on Computer Science and Education (ICCSE 2025)**, held this year in the beautiful and historically rich city of **Fukui, Japan**.
Since its inception in 2006 in Xiamen, ICCSE has grown into a vibrant annual gathering where researchers, educators, and professionals from around the globe come together to exchange knowledge, inspire innovation, and collaboratively shape the future of computer science and education. This year marks the 19th anniversary of the conference, and we are honored to celebrate this milestone in Fukui—a region where nature, tradition, and technological innovation coexist in harmony.

The theme of ICCSE 2025, **"AI and Digital Literacy: Shaping the Future of Education"**, reflects the growing significance of integrating artificial intelligence and digital literacy into modern educational practices. The convergence of artificial intelligence, large-scale models, data science, and neurocognitive research opens new frontiers not only in how we educate, but also in how we understand human behaviors, cognition, and social interaction. ICCSE 2025 will feature presentations that span educational technology, cognitive science, linguistic analytics, and intelligent healthcare—demonstrating how cross-disciplinary inquiry can generate solutions to the complex challenges facing today's digital society.

During this year's conference, a **pre-conference academic exchange** will be held in Osaka from **August 19 to 20**, at **Ritsumeikan University, Osaka Ibaraki Campus**. The main conference will take place in **Fukui from August 21 to 24, 2025**.

We are honored to host a distinguished lineup of keynote speakers, whose insights will guide us through the intersections of **generative AI**, **cybersecurity**, **digital ethics**, and **educational transformation**. In addition, several invited sessions organized by leading researchers will enrich and deepen the breadth of topics explored. This year's **Special Workshops** will focus on themes ranging from **cutting-edge medical imaging** to **neurocognitive approaches in language learning and behavior**. Furthermore, the **DCLC Workshop** will highlight assessments of digital capabilities and the advancement of digital skills through emerging technologies.These workshops and invited sessions exemplify the depth and diversity of ICCSE, encouraging dynamic and collaborative dialogues between the fields of engineering, humanities, and social sciences.

Our host city, **Fukui**, offers a tranquil yet intellectually stimulating environment. Nestled between the Sea of Japan and the Echizen mountains, it is a place where one can experience breathtaking coastal scenery, enjoy world-renowned **Echizen cuisine**, and explore a rich tapestry of cultural heritage, including ancient Zen temples and traditional crafts. Visitors can explore the historic Zen monastery **Eiheiji**, savor regional delicacies such as **Echizen crab** and **buckwheat soba**, and enjoy some of Japan's finest **sake**, brewed from the region's pristine water and high-quality rice. Fukui is also widely known as Japan's **"Dinosaur Kingdom."** With ongoing fossil discoveries and the renowned **Fukui Prefectural Dinosaur Museum**, the region proudly celebrates its identity through education, tourism, and innovation. We encourage all participants to take time to experience the warmth, flavors, and distinct character of this remarkable city.

As the General Chair, I would like to express my heartfelt gratitude to everyone who made this conference possible. My sincere thanks go to the keynote speakers, workshop organizers, paper reviewers, and local committee members for their unwavering dedication and hard work. Special recognition is due to the team at the **University of Fukui** and our partner institutions for their outstanding support and seamless coordination.

I look forward to the vibrant discussions, new collaborations, and inspiring moments that lie ahead. May **ICCSE 2025** be a truly **memorable and enriching experience** for every participant.

Dr. Hiroki Takada
General Chair, ICCSE 2025
University of Fukui, Japan

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Keynote Speech I

High-Precision, Full-Color, Real-Time 3D Shape Measurement System with High-Brightness Fringe Projection and the Whole-Space Tabulation Method

Professor Motoharu Fujigaki

Human and Artificial Intelligent Systems, Graduate School of Engineering

University of Fukui, JAPAN.

Abstract: We have developed a full-color, real-time 3D shape measurement device based on a projected fringe pattern. In recent years, we have developed a high-brightness fringe pattern projection unit using high-power LEDs and a cylindrical lens array. This has enabled the realization of a compact and high-speed 3D measurement device. We have also proposed the Whole-Space Tabulation Method (WSTM), which eliminates systematic errors such as lens distortion. By combining this method with the device, we have achieved a high-precision and high-speed 3D measurement system. This device can be applied to human body measurement for medical and apparel purposes, appearance inspection in manufacturing, and the inspection of infrastructure structures by mounting it on drones. In this presentation, we will introduce its principles, design method, and prototype.

Speaker Biography

Motoharu Fujigaki is a Professor in University of Fukui. He received his doctoral degree in Engineering from Osaka University in 2001. He is interested in optical metrology using image processing, especially 3D shape and deformation measurement using phase analysis of fringe patterns. His research areas include robot sensing, experimental mechanics, nondestructive inspection, remote sensing, and life mechatronics. He is also President of Kaeru Keisoku Co., Ltd., a university-originated venture company he established in 2022. He is actively engaged in promoting industry-academia collaboration through this company.

Keynote Speech II

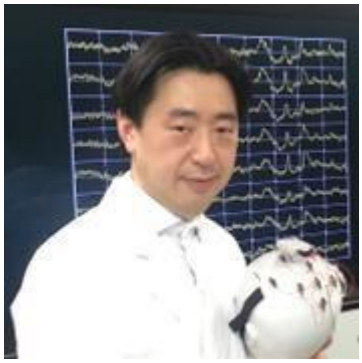
Neurotraining and Inclusive Gaming Using a Virtual Brain Switch

Dr. Ryohei P. Hasegawa

National Institute of Advanced Industrial Science and Technology (AIST), JAPAN

Abstract： We have developed a communication system, Neurocommunicator®, based on a brain-machine/computer interface (BMI/BCI) that interprets electroencephalogram (EEG) signals to support individuals with severe motor impairments. This system enables users to express their intentions via a virtual EEG switch, even without speech or movement. Clinical trials revealed reduced brain responsiveness in elderly or bedridden users, prompting the development of Neurotrainer® — a hands-free cognitive training platform that utilizes the same brain-switch mechanism. Initially designed for physically impaired patients, it has since shown promise in broader applications, including dementia prevention and attention training for neurodiverse children. To further enhance engagement and social interaction, we also created bSports (the "b" stands for brain), a competitive activity where players either control PC games or humanoid robots via the EEG switch. This inclusive framework enables intergenerational participation and equal competition regardless of physical ability. In this talk, we introduce the system's core principles, technical implementation, and its future potential as an EEG-based ecosystem for communication support and cognitive enhancement.

Speaker Biography



Dr. Ryohei P. Hasegawa is Chief Senior Research Scientist at the Research Institute on Human and Societal Augmentation (RIHSA), National Institute of Advanced Industrial Science and Technology (AIST), Japan. He also holds visiting professorships at the University of Fukui, Nagoya University, and Tokyo University of Science. His work focuses on BMI/BCI technologies, cognitive engineering, and neurotechnology for assistive communication and healthcare applications. His Neurocommunicator, an EEG-based system for users with severe motor disabilities, has earned multiple awards and attracted broad attention from both national and international media for its clinical and societal impact. Dr. Hasegawa leads interdisciplinary initiatives bridging neuroscience, engineering, and inclusive design.

Keynote Speech III

From Digital Literacy to Digital Leadership: A Three-Tier Capability Framework

Professor HONG Wenxing

School of Aerospace Engineering

Xiamen University, China.

Abstract: In the era of generative AI and ubiquitous digitalization, cultivating a robust pipeline of digital talent has become a strategic imperative for nations, industries, and organizations. This keynote distills lessons from China's national initiatives, large-scale pilot programs, and an evidence-based three-tier capability model—Digital Literacy Foundations, Applied Digital Skills, and Digital Leadership—to chart a practical path from individual competence to systemic transformation. Drawing on the first national "Digital Competence Level Certification" (DCLC), the accompanying open-access curriculum, and AI-enhanced assessment tools, we demonstrate how universities, enterprises, and governments can co-create an ecosystem that closes the projected 25–30 million digital-talent gap by 2026, embeds ethical and inclusive practices, and accelerates AI-driven innovation across finance, manufacturing, and public services. Actionable next steps—dynamic certification linked to public-service platforms, localized industry-academy hubs, and generative-AI-assisted learning—are proposed to ensure that digital literacy evolves into digital leadership, ultimately powering high-quality, sustainable digital economies worldwide.

Speaker Biography

Prof. Hong Wenxing is a Professor and Director of the Department of Automation at Xiamen University, where he also serves as a Ph.D. advisor. He received his Ph.D. in 2010 through a joint doctoral program between Xiamen University and Nanyang Technological University. He currently leads the Xiamen Institute of Information Technology and serves as Secretary-General of the Fujian Society of Systems Engineering.

His research interests span data mining, big data analytics, intelligent systems, and the digital economy. He has led multiple projects focusing on smart financial services, risk control, personalized recommendation, smart city technologies, and healthcare data platforms. He is also actively engaged in developing digital infrastructure, including the Digital Silk Road Innovation Service Platform, to foster data-driven innovation and cross-sector integration.

Invited Sessions

Topic 1: Building Science Popularization Educational Resources in the Age of AI

Chairs:

Session Chair

ZHOU Wei, Beijing Jiaotong University, China (wzhou@bjtu.edu.cn)

Co-Chair

CHEN Yulin, National Penghu University of Science and Technology, Taiwan region (yulinchen@gmail.com)

QIANG Yan, School of Software, North University of China, China (27420265@qq.com)

Abstract

Artificial intelligence has not only changed the forms and content of education but also put forward new requirements for the development, integration, and distribution of educational resources. Universities, primary and secondary schools, enterprises, scientific research institutions, and social venues all played crucial roles in science popularization education. How can we efficiently build science popularization educational resources and effectively carry out science popularization activities in the age of artificial intelligence? This special session aims to bring together various parties to explore the paths and strategies for constructing science popularization educational resources in the age of artificial intelligence, providing theoretical support and practical guidance for building a more inclusive social education system.

Topics include but are not limited to:

- Application of artificial intelligence in the development of science popularization educational resources;
- Construction of information technology and programming resources for young people;
- Sustainable development of science popularization activities, such as organizing volunteers, planning personalized activities;
- Successful cases and practical experience.

Short Bio of Chairs

ZHOU Wei

Prof. ZHOU Wei is Senior Researcher of Computer Science and Technology at Beijing Jiaotong University, China. She received the Ph.D. degree from Nagoya University (Japan).

With main research interests in Data Science, AI, System Engineer, Education Technology, Information Services, she has published many papers of international conference and journals, and served on some editorial boards.Her current research interests include IoT, cloud computing and artificial intelligence.

Details of Prof. ZHOU's experiences can be found at: http://faculty.bjtu.edu.cn/8405/

CHEN Yulin

CHEN Yulin, Ph.D., is an Associate Professor in the Department of Marketing and Logistics Management at National Penghu University of Science and Technology. She received the Ph.D. degree from Nagoya University (Japan). She delivers advanced instruction in Internet Marketing, Big Data Analytics, Social Media Analysis, and Quantitative Research Methods.

Dr. CHEN's academic inquiry is centered on the intersection of social media mining, large-scale data analytics, AI-enhanced multimodal content interpretation, and latent topic modeling.

QIANG Yan

Prof. QIANG Yan, Dean of the School of Software, North University of China, Ph.D. in Engineering, Professor, Doctoral Supervisor. He is a famous teacher in Shanxi Province, an expert in engineering education certification of the Ministry of Education, a standing member of the Virtual Reality and Visualization Committee of the China Computer Society, and an executive member of the Education Committee. In recent years, he has published more than 80 SCI papers, including one highly cited paper in the top 1% of ESI global top.

Prof. Qiang is mainly engaged in the research of computer application technologies such as medical image processing and artificial intelligence algorithms, focusing on the cross-disciplinary research of medicine and engineering.

Details of Prof. QIANG's experiences can be found at: https://ss.nuc.edu.cn/info/1022/4136.htm

Topic 2: AI-enabled Computer Practice Teaching

Chair:

Session Chair

QU Dapeng, Liaoning University, China (dapengqu@lnu.edu.cn)

Co-Chair

HE Qiang, Northeastern University, China (heqiang@bmie.neu.edu.cn)

Abstract

The rapid advancement of artificial intelligence (AI) is revoluting education, various innovative AI-driven methodologies, tools, and platforms are reshaping how computer practice is taught and learned. AI is integrated into curriculum design, personalized learning experiences, automated assessment systems, and the ethical considerations of AI in education etc. By bringing together educators, researchers, and industry experts, this session is intended to provide a forum to share insights, challenges, and future directions in AI-enabled computer practice teaching.

Topics are included but not limited to:

- AI-Driven Learning Paths in Computer Science Education;
- Automated Assessment and Feedback Systems in Programming Courses;
- Ethical Implications of AI in Educational Settings;
- AI-Enhanced Virtual Labs for Computer Practice;
- Integrating AI into Curriculum Design.

Short Bio of Chairs

QU Dapeng

QU Dapeng, Ph.D., Associate Professor, Master's Supervisor, Senior Member of CCF, Executive Committee Member of Computer Education Committee, and Internet Committee in CCF. Director of the Science and Innovation Center, Faculty of Information, Liaoning University, Outstanding Party Affairs Worker of Liaoning Province, and Outstanding Young Faculty Member in Liaoning University.

HE Qiang

HE Qiang received the Ph.D. degree in computer application technology from the Northeastern University, Shenyang, China in 2020. He also worked with School of Computer Science and Technology, Nanyang Technical University, Singapore as a visiting Ph.D. researcher from 2018 to 2019. He is currently a Professor at the College of Medicine and Biological Information Engineering, Northeastern University, Shenyang, China. His research interests include cloud computing, edge computing, machine learning, social network analytic, health care, etc. He has published more than 90 journal articles and conference papers, including IEEE/ACM Transactions on Networking, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Mobile Computing, IEEE Transactions on Neural Networks and Learning Systems, NeurIPS, AAAI.

Topic 3: Innovation and Practice in AI Education and Teaching

Chairs:

Session Chair

LUO Juan，Hunan University (juanluo@hnu.edu.cn)

Co-Chair

ZHAO Huan, Hunan University (hzhao@hnu.edu.cn)

CAI YuHui，Hunan University (rj_cyh@hnu.edu.cn)

Abstract

The widespread application of artificial intelligence (AI) technology is accelerating the transformation of the educational ecosystem, driving innovation in curriculum systems, interdisciplinary integration, and the modernization of teaching and management models. To address this trend, this session focuses on core issues such as the design of AI general education systems, multidisciplinary collaborative innovation, and AI-empowered teaching, aiming to explore new educational paradigms tailored to the intelligent era.

Topics include but are not limited to:

- Design and Exploration of AI General Education Curriculum Systems: Development of AI literacy frameworks and curriculum reforms for students across diverse academic disciplines;
- Interdisciplinary Integration and Research in AI: Curriculum reforms for cultivating cross-disciplinary talent through AI applications in fields such as humanities, social sciences, and engineering;
- Practical Teaching Research in AI: Innovations in teaching models, laboratory platform design, case study development, student competency training, and evaluation of educational outcomes in AI practice;
- AI-Empowered Teaching: Research on AI-driven personalized learning, intelligent tutoring systems, automated assessment, and educational big data analytics. This session seeks to establish a collaborative forum for AI education research, promote the translation of theoretical advancements into practical teaching, and provide systematic solutions for educators worldwide.

Short Bio of Chairs

LUO Juan

LUO Juan, Ph.D., is a Professor, doctoral supervisor, and associate dean at the College of Computer Science and Electronic Engineering. She earned her bachelor's degree from the National University of Defense Technology and her master's degree and Ph.D. from Wuhan University. Previously, she worked at Fiberhome Networks, a company affiliated with the Wuhan Academy of Posts and Technology, and was a visiting scholar at the University of California, Irvine. She has been recognized as a New Century Outstanding Talent by the Ministry of Education and was granted the Hunan Province Outstanding Youth Fund.

Her current research focuses on IoT, cloud computing, and artificial intelligence.

Details of Prof. LUO's experiences can be found at: http://csee.hnu.edu.cn/people/luojuan

ZHAO Huan

ZHAO Huan, Ph.D., Professor, Doctoral Supervisor, Associate Dean, College of Computer Science and Electronic Engineering. She is visiting scholar at the University of California, San Diego, the member of the Computer Basic Teaching Steering Committee of the Ministry of Education, and the member of the Steering Committee of the Education and Training of Industrial and Information Talents. She won the second prize of National Teaching Achievement Award, the Outstanding prize of BAOGANG distinction teacher and Huo Yingdong Education Foundation Education and Teaching Award.

Her research interests include embedded computer systems and speech information processing.

Details of Prof. ZHAO's experiences can be found at: http://csee.hnu.edu.cn/people/zhaohuan

CAI Yuhui

CAI Yuhui is an Associate Professor at the College of Computer Science and Electronic Engineering in Hunan University whose research interests include computer networks, image processing, and artificial intelligence. He won the second prize of the Chinese University Science and Technology Award. And he was employed by the Ministry of Education of PRC in 2023 as a member of the course construction team for Computer Science Undergraduate Education and Teaching pilot reform program.

Details of Prof. CAI's experiences can be found at: http://csee.hnu.edu.cn/people/caiyuhui

Topic 4: Cultivating Computational and Mathematical Thinking through Solving Problems by Programming

Chair:

Session Chair

WU Yonghui, Fudan University, China (yhwu@fudan.edu.cn)

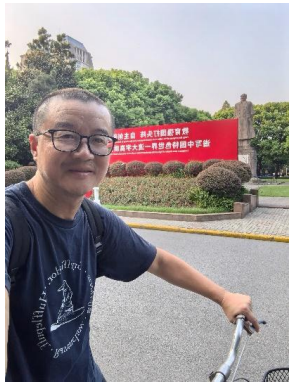
Abstract

Now all professions reliant on tool-based skills, including programmers, are being replaced by AI technologies. First, the lecture analyzes programming education and programming contests, and proposes cultivating computational and mathematical thinking through solving problems by programming is the breakthrough point for the reform of computer education in the AI era.

Second, the lecture demonstrates cultivating computational and mathematical thinking:

- The book series "for collegiate programming contests and education": programming knowledge system and programming strategies, using programming contest problems and their analyses as experimental learning units;
- Curriculums for solving problems by programming: The guiding ideology is programming is a technology. Case teaching is as the teaching mode. And virtual programming contests are informatization technologies;
- "1+M+N" programming training system cross regions: one programming curriculum series for solving problems by programming, collaborating across regions with M universities, enabling N students to benefit from the learning experience. Finally, the innovation and effects are introduced;

Short Bio of Chairs



WU Yonghui

Dr. WU Yonghui, Associate Professor at Fudan University, a visiting scholar at Stony Brook University, and an Adjunct Professor at Quanzhou University of Information Engineering. He won three medals in ACM ICPC World Finals for Fudan University. His book series "Collegiate Programming Contests and Education" has been published in simplified and traditional Chinese and English: the former by respective publishers of mainland China and Taiwan, and the latter by CRC Press. Since 2013, he has been giving lectures not only in China, but also in other countries.

Special Workshop 1

The Expanding Role of Imaging: Understanding Aging, Supporting Diagnosis, Guiding Therapy

Session Overview

This invited session explores the expanding roles of imaging in modern radiological practice. Topics include neuroscience applications such as fMRI-based visualization of age-related brain changes, AI-powered diagnostic support in nuclear medicine, and CT-image-guided adaptive proton therapy. Through these diverse yet complementary perspectives, the session highlights how medical imaging is evolving beyond simple visualization into a foundational tool for intelligent, patient-centered care.

Speakers & Presentations

1. Akihiro Sugiura, RT, Ph.D.

Affiliation: Gifu University of Medical Science

Title: Visualizing Visual Function and Aging Using fMRI

Short Bio

Akihiro Sugiura

Associate Professor, Certified Radiological Technologist, Ph.D. in Information Science. Actively engaged in neuroscience and MRI research, articularly in visual information processing and age-related brain changes.

2. Akinobu Kita, RT, Ph.D.

Affiliation: Gifu University of Medical Science

Title: Nuclear Medicine and Deep Learning: Utilizing AI for Patient-Friendly Imaging

Short Bio

Akinobu Kita

Associate Professor, RT, Ph.D. in Health Sciences.
Specializes in nuclear
medicine and the application of AI technologies such as image rest oration andSPECT quantification.

3. Yoshikazu Maeda, Ph.D., Medical Physicist

Affiliation: University of Fukui

Title: CT-image guided proton radiotherapy and related researches aiming for adaptive treatment

Short Bio

Yoshikazu Meada

Professor and Certified Medical Physicist,
specializing in adaptive protontherapy.
Formerly a senior researcher at Fukui Prefectural Hospital, where he led clinical implementation of CT-based image guidance and real-timedose monitoring.

Special Workshop 2

Quantitative and Neurocognitive Analyses in Language, Behavior, and Brain Function

Session Overview

This session brings together researchers working at the intersection of neuroscience, language, and data-driven behavioral analysis. The presentations cover a range of quantitative methodologies applied to cognitive function, linguistic dynamics, and eye movement behavior. Specifically, the session explores (1) the use of high-frequency EEG and wavelet analysis for detecting early cognitive decline, (2) morphological parsing to track emotional and social shifts in film dialogue, (3) text mining techniques to reveal stylistic differences in literary translations, (4) the role of microsaccades in covert attention, and (5) high-speed reading aloud as a pedagogical strategy for enhancing cognitive and expressive language skills in non-Kanji background learners. Together, these studies showcase innovative approaches to understanding human cognition and communication through empirical and computational techniques, offering new insights for both clinical and cultural applications.

Speakers & Presentations

1. Kakeru Amano

Affiliation: Department of Human and Artificial Intelligent Systems, Graduate School of Engineering, University of Fukui, Japan

Title: High-Frequency EEG Biomarkers of Cognitive Function Revealed by Wavelet Analysis

2. Sana Domae

Affiliation: Department of Cross Cultural Studies, Gifu City Women's College, Japan

Presentation: Quantitative Analysis of Dialogue Dynamics: Tracking Emotional Shifts in Green Book Through Morphological Parsing

3. Kokoro Chaya

Affiliation: Education and Research Center for Data-Driven Science, Gifu City Women's College, Japan

Title: Comparative Analysis of Translator Styles in Lu Xun’s Works using Text Mining

4. Fumiya Kinoshita

Affiliation: Graduate School of Engineering, Mie University, Japan

Title: A Study on the Effect of Covert Attention on Microsaccade Direction

5. Kenichiro Kutsuna

Affiliation: Faculty of Humanities and Social Sciences,Thaksin University, Japan

Title: High-speed Reading Aloud as a Pedagogical Strategy for Enhancing Cognitive and Expressive Language Skills in Non-Kanji Background Learners

General Conference Information

Language

The official language of the conference is English.

Pre-Conference Academic Exchanging Event

Visit the Intelligent Image Processing Lab,College of Information Science and Engineering, Ritsumeikan University and tour the Ritsumeikan University Ibaraki Campus.

Official Website： https://media.ritsumei.ac.jp/iipl/

Address: 2-150 Iwakura-cho, Ibaraki, Osaka 567-8570 Japan

Chairs:

Event Chair

LIU Jiaqing, Ritsumeikan University, Japan.

Co-Chairs

ZHOU Wei, Beijing Jiaotong University, China.

CUI Binyue, Xiamen University, China.

Short Bio of Chairs

LIU Jiaqing

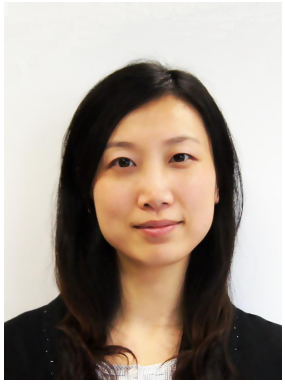
LIU Jiaqing received his B.E. degree from Northeastern University, China, in 2016. He then earned both his M.E. (2018) and D.E. (2021) degrees from Ritsumeikan University in Kyoto, Japan. From 2020 to 2021, he was a JSPS Research Fellow for Young Scientists. He subsequently served as a Specially Appointed Assistant Professor at the Department of Intelligent Media, Institute of Scientific and Industrial Research (ISIR), Osaka University, from October 2021 to March 2022. He is currently an Assistant Professor at the College of Information Science and Engineering, Ritsumeikan University. His research interests include computer vision, medical engineering, and deep learning.

ZHOU Wei

Prof. ZHOU Wei is Senior Researcher of Computer Science and Technology at Beijing Jiaotong University, China. She received the Ph.D. degree from Nagoya University (Japan).

With main research interests in Data Science, AI, System Engineer, Education Technology, Information Services, she has published many papers of international conference and journals, and served on some editorial boards.Her current research interests include IoT, cloud computing and artificial intelligence.

Details of Prof. ZHOU's experiences can be found at: http://faculty.bjtu.edu.cn/8405/



CUI Binyue

CUI Binyue, Ph.D. in Information Science, Associate Professor, and Special Research Fellow at the Belt and Road Research Institute, Xiamen University. She has published over 40 academic papers, authored one monograph, led and participated in multiple research projects in Japan and China. She was a key contributor to the development of the group standard "Digital Literacy and Skills Certification" led by the Computer Education Research Association of Chinese Universities, and has been actively involved in promoting the implementation and practice of the Digital Capability Level Certification. Her research interests include digital education, data intelligence, Intelligent assessment of capabilities and literacy.

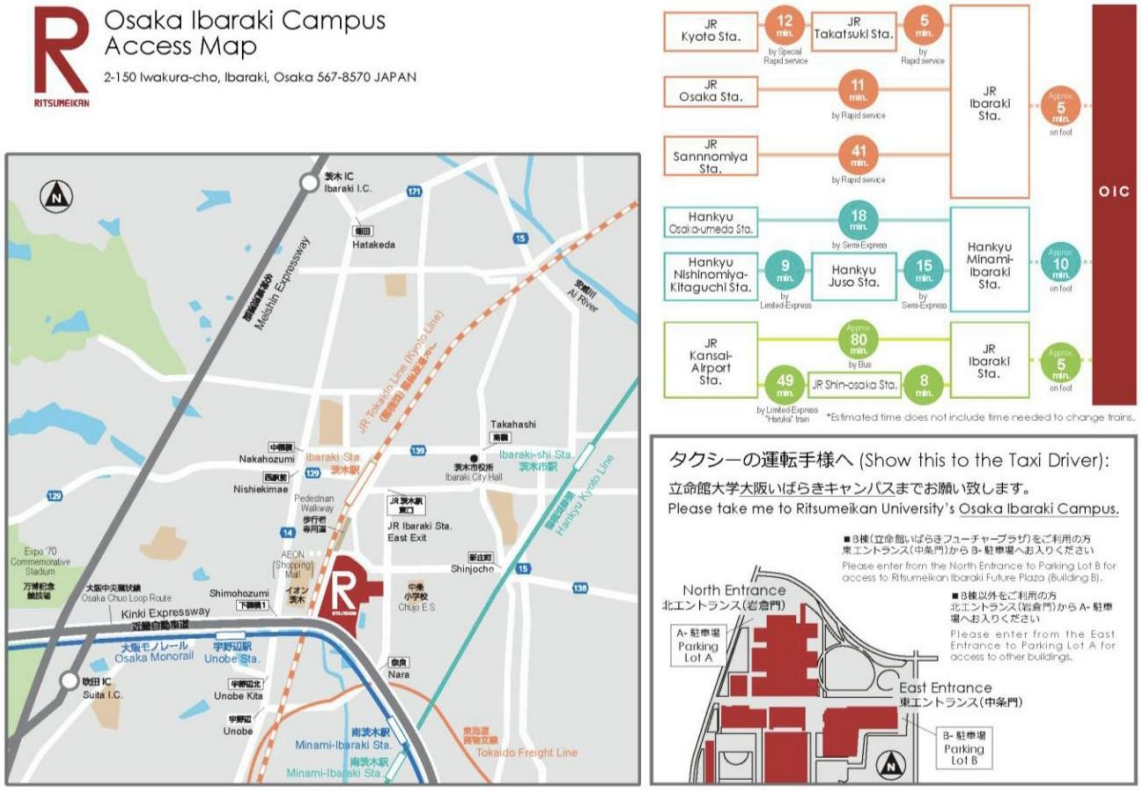
Pre-conference Venue

- **Osaka Ibaraki Campus (OIC), Ritsumeikan University, Osaka, Japan**

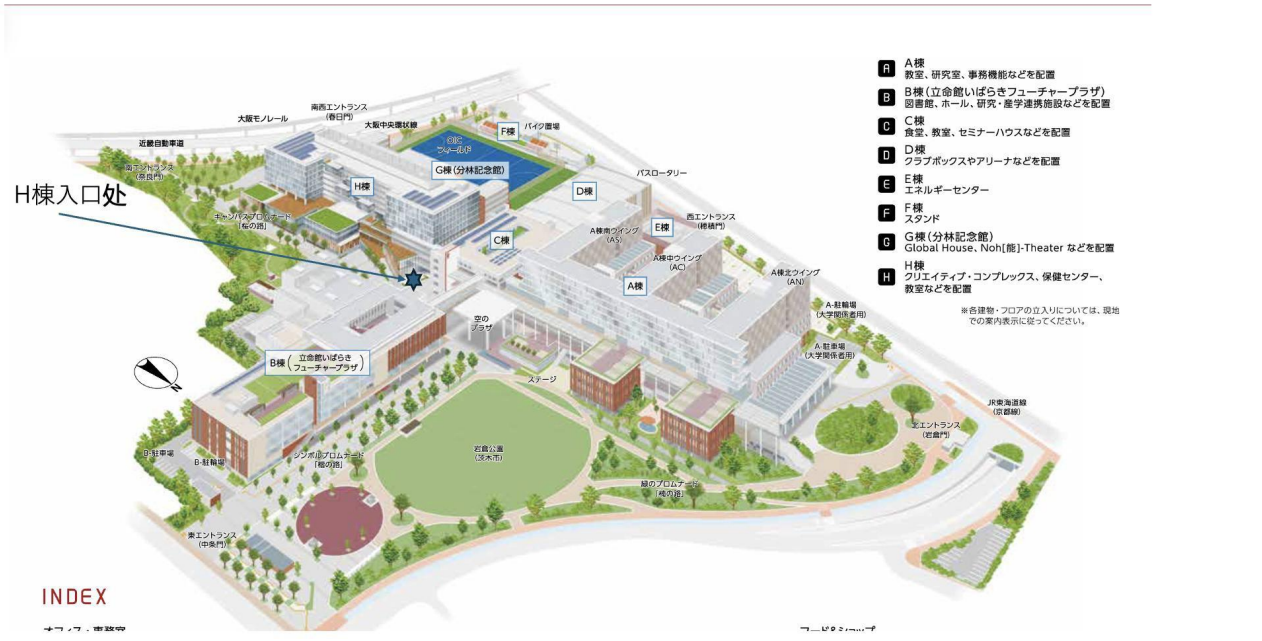
Ritsumeikan University (立命館大学) is a private university in Japan that traces its origins to 1869. With its Kinugasa Campus (KIC) in Kyoto, the university also has two satellite campuses: the Biwako-Kusatsu Campus (BKC) and the Osaka-Ibaraki Campus (OIC).

The Osaka-Ibaraki Campus (OIC), Ritsumeikan's newest campus, opened in April 2015. Located midway between Osaka and Kyoto, it is within walking distance of two train lines, providing easy access to both cities. The OIC is fully equipped with adaptable learning spaces and facilities designed for academic exchange. The campus community actively collaborates with industry and government institutions, promoting Ritsumeikan's role at the forefront of social engagement and innovation.

- **Access to Osaka Ibaraki Campus, Ritsumeikan University**



- **Ibaraki Campus, Ritsumeikan University**



MAP-Ibaraki Campus, Ritsumeikan University

Official website of Ibaraki Campus: https://www.ritsumei.ac.jp/campusmap/#oic

- **Hotel Recommendation-Osaka**

ホテルクレスト いばらき(Japanese)

〒567-0033 大阪府茨木市松ヶ本町 1－8

電話番号： 072-620-2020

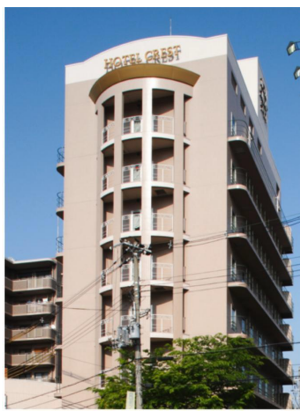
http://www.hotel-crest.co.jp/crest_ibaraki/

Hotel Crest Ibaraki（English）

1-8 Matsugamoto-cho, Ibaraki City, Osaka Prefecture, 567-0033, Japan

Phone number: +81-72-620-2020

http://www.hotel-crest.co.jp/crest_ibaraki/



ホテルクレストディオ(Japanese)

所在地：〒567-0888大阪府茨木市駅前１丁目３－２
電話番号：072-620-1010

http://www.hotel-crest.co.jp/crest_dio/

Hotel Crest Dio（English）

Address: 1-3-2 Ekimae, Ibaraki City, Osaka Prefecture, 567-0888, Japan

Phone number: +81-72-620-1010

http://www.hotel-crest.co.jp/crest_dio/

Main Conference Main Venue

- **Fukui International Activites Plaza**

Address & Contact

- Address: 3-1-1 Hoei, Fukui City, Fukui 910- 0004, Japan
- Phone: +81-776-28-8800
- Open from: 9:00 AM

Access: https://www.f-i-a.or.jp/ja/plaza/access/

From JR Fukui Station (West Exit):

approx. 10 minutes on foot (about 700m)

[RECOMMENDED] approx. 5 minutes by Taxi (about 800 JPY)

Welcome Reception: Fukui International Activities Plaza (Same as conference venue)

- Reception Date/Time: August 21st (THU.), 17:30-19:30
- Location: Fukui International Activities Plaza, 3F Special Conference Room

Conference Banquet Venue: Courtyard by Marriott Fukui

- Banquet Date/Time: August 23rd (SAT.), start at 19:00
- Location: Fukui Marriott Hotel, 4F Fuyo (芙蓉)
- Address: 1-1-1 Chuo, Fukui City, Fukui 910- 0006, Japan
- Access (Google Map)

from Fukui International Activities Plaza

- [RECOMMENDED] By Taxi: About 5 minutes (1,000 JPY)

- On Foot: Approx. 12–15 minutes (1.0 km)
  You can walk directly from the Plaza to the hotel via Chuo-dori Street or by cutting through Fukui Station's underground passage.

from JR Fukui Station

- Direct Access: The Fukui Marriott Hotel is directly connected to **Fukui Station West Exit (2nd Floor)**.

Access to Main Conference Venue (Transportation to Fukui from Osaka or Kyoto)

Fukui is accessible from both Osaka and Kyoto via multiple transportation options, including train, highway bus, and car. Below are the recommended travel methods:

By Train (Limited Express Thunderbird & Hokuriku Shinkansen)

- **From Osaka**
  - Take the Limited Express Thunderbird from Osaka Station to Tsuruga Station (approx. 1 hour 30 minutes).
  - Transfer to the Hokuriku Shinkansen at Tsuruga Station and take a direct train to Fukui Station (approx. 15 minutes).
  - Total travel time: ~1 hour 45 minutes.

- **From Kyoto:**
  - Take the Limited Express Thunderbird from Kyoto Station to Tsuruga Station (approx. 1 hour).
  - Transfer to the Hokuriku Shinkansen at Tsuruga Station and take a direct train to Fukui Station (approx. 15 minutes).
  - Total travel time: ~1 hour 15 minutes.

University of Fukui

The University of Fukui (UF), established in 1949, is a national university located in Fukui City, Japan. It serves as the sole national university in Fukui Prefecture and plays a central role in the region's academic, scientific, and cultural development.

The university is guided by its founding spirit, expressed in Japanese as Kakuchi ni yorite hito to shakai no mirai o hiraku, which translates to "Pioneering the future of people and society through the pursuit of truth." The word Kakuchi (格致) conveys the idea of deep inquiry into the principles of nature and human life-a commitment to knowledge, discovery, and responsible contribution to society. This philosophy underpins the university's efforts in education, research, and public engagement.

UF consists of four main schools: Education, Medical Sciences, Engineering, and Global and Community Studies. These are supported by a wide range of graduate programs and interdisciplinary research centers. Notable areas of research include robotics, disaster-resilient infrastructure, human-computer interaction, child mental development, and biomedical imaging. The university also emphasizes collaboration with local communities and industry to address regional and societal challenges.

Internationalization is another key priority. UF maintains academic partnerships with over 100 institutions worldwide and offers diverse opportunities for student and faculty exchange, joint research, and English-language education. Dedicated support systems for international students help promote cultural understanding and global engagement on campus.

Located in a region known for its natural beauty and cultural heritage, the University of Fukui embodies a unique harmony between tradition and innovation. As it continues to expand its global presence, UF remains committed to fostering individuals who can think deeply, act ethically, and contribute meaningfully to the future of an interconnected world.

Official Website: https://www.u-fukui.ac.jp/

Mini Lab Tours from UF at ICCSE 2025

We are pleased to announce a special opportunity for ICCSE 2025 participants: Mini Lab Tours featuring three cutting-edge research groups at the University of Fukui and the National Institute of Advanced Industrial Science and Technology (AIST). These visits offer a first-hand look into innovative laboratories working at the intersection of nonlinear science, human augmentation, and intelligent optical metrology. Each tour will include live demonstrations, collaborative research displays, and opportunities for discussion with leading researchers.

1. Nonlinear Science Laboratory, University of Fukui

Lab Director: Prof. Hiroki Takada

The Nonlinear Science Laboratory explores complex dynamics found in nature and society through mathematical modeling and nonlinear physics. From chaos theory and pattern formation to neural signal analysis and complex systems, the lab pioneers interdisciplinary research that bridges mathematics, informatics, biology, and engineering.

In recent years, Prof. Takada has proposed the framework of "Multi-Modal Intelligence" — an integrative perspective that synthesizes data across modalities (e.g., EEG, eye movements, physiological signals, 3D visual stimuli) to deepen understanding of human cognition, emotion, and adaptation. This approach connects theoretical foundations with real-world applications through computational modeling and simulation. This concept is scheduled to be formally introduced as a

keynote presentation at the JSAT international conference hosted by Thaksin University in December 2025.

New Featured Methodology: The lab also presents a generalized framework for quantifying signal-to-noise (S/N) ratios across diverse biomedical time-series data (EEG, ECG, EMG, respiratory signals). This method utilizes the translation error derived via the Wayland algorithm on time-delay embedded trajectories (Takens' method), showing that the inverse of the translation error directly estimates S/N ratios in systems modeled by stochastic differential equations. This non-parametric, real-time-compatible approach has strong potential for use in wearable health monitoring, telemedicine, and cognitive function evaluation.

Exhibits and Demonstrations:

- A nonlinear mathematical model-based some biofeedback system
- A vision restoration training system using stereoscopic imagery, developed with industrial partners
- A health promotion sauna system using smart sensors, developed with industrial partners

This laboratory exemplifies a unique fusion of nonlinear science and real-world innovation, laying the foundation for future intelligent systems.

Website： https://nonlinear.geo.jp/

2. Research Institute on Human and Societal Augmentation, AIST

https://unit.aist.go.jp/rihsa/en/index.html

Special Guest: Dr. Ryohei Hasegawa (Senior Principal Researcher, AIST; Visiting Professor, University of Fukui)

Dr. Ryohei Hasegawa and his team are advancing cutting-edge neurotechnologies through the development and integration of EEG-based brain-machine interfaces (BMI), hands-free communication aids, cognitive assessment tools, and real-time neuromarketing (NeuroShopping).

Their recent work focuses on “bSports” (brain-machine interface-based sports), in which users control humanoid robot avatars (Ninja Type) using their brain activity to play sports or engage in battles against virtual enemies.

Key Highlights:

- Real-time EEG decoding with lightweight, wearable 8-channel wireless headsets
- BMI-based control of humanoid robots for sports and action-oriented tasks
- Brain-based communication and cognitive assessment systems with high prediction accuracy

This visit will feature live demonstrations of brain-controlled robotic interactions and discussions on their applications in assistive technology, entertainment, marketing, and cognitive evaluation.

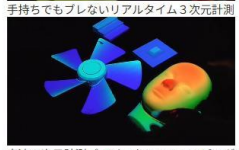
3. Innovative Optical Measurement System Laboratory, Department of Mechanical and System Engineering, University of Fukui

Lab Director: Prof. Motoharu Fujigaki

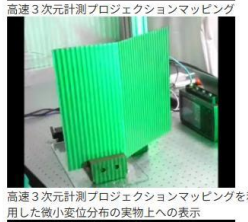
This laboratory develops cutting-edge optical and image-based full-field measurement systems. It focuses on real-time, high-precision 3D shape, strain, and defect detection techniques using structured light, moiré imaging, digital holography, and phase-shifting projection.

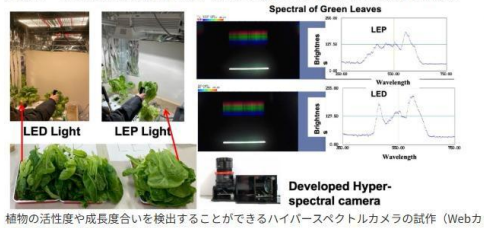

フルカラーリアルタイム３次元計測（1000fpsで位相シフトをしながら撮影）
シリンドリカルレンズアレイを用いることで高輝度化を実現→露光時間の短縮
（高精細動画はこちら）


手持ちでもブレないリアルタイム３次元計測


高速３次元計測プロジェクションマッピング


フルカラー３次元計測で水耕栽培のレタスの葉の動きを動きを撮影（10分間隔で48時間）


高速３次元計測プロジェクションマッピングを利用した微小変位分布の実物上への表示



植物の活性度や成長度合いを検出することができるハイパースペクトルカメラの試作（Webカメラを使って安価に構築する）


ピント調整がいつでもできる振動に強い３次元計測（特徴量型全空間テーブル化手法）の試作1号機

Key technologies include:

- Ultra-fast 3D measurement systems (12,000 fps) with world-leading speed and accuracy
- Remote strain measurement for large infrastructure using long-range sampling moiré cameras (130m range, <0.5mm error)
- Handheld systems for visualizing strain and detecting internal defects
- User-friendly designs with predictive error modeling, self-calibration, and intelligent

automation

Application areas span from structural health monitoring and smart manufacturing to agricultural sensing and space engineering. Highlights will include live demonstrations of:

- Compact 3D measurement units with line-LED projectors
- Smart agricultural sensing devices (e.g., leaf firmness evaluation via vibration imaging)
- Real-time visualization of deformation via projection mapping

https://www.os.his.u-fukui.ac.jp/

- **Tour Information:**

- Each lab tour includes a 20-30 minute guided session with live demonstrations and Q&A
- Tours will take place within the ICCSE 2025 conference venue, utilizing multiple dedicated rooms to recreate lab environments and enable interactive exhibitions
- Participation may be limited, so early registration is encouraged
- Detailed schedules will be provided via conference announcements

We welcome you to discover the forefront of interdisciplinary science and technology through these dynamic lab tours.

- **Access to Nonlinear Science Laboratory**

Address:

Nonlinear Science Laboratory

7th Floor, General Education Building, Bunkyo Campus, University of Fukui
3-9-1 Bunkyo, Fukui City, Fukui 910-8507, Japan

Access:

- **By Train / Echizen Railway (Mikuniminato Line)**

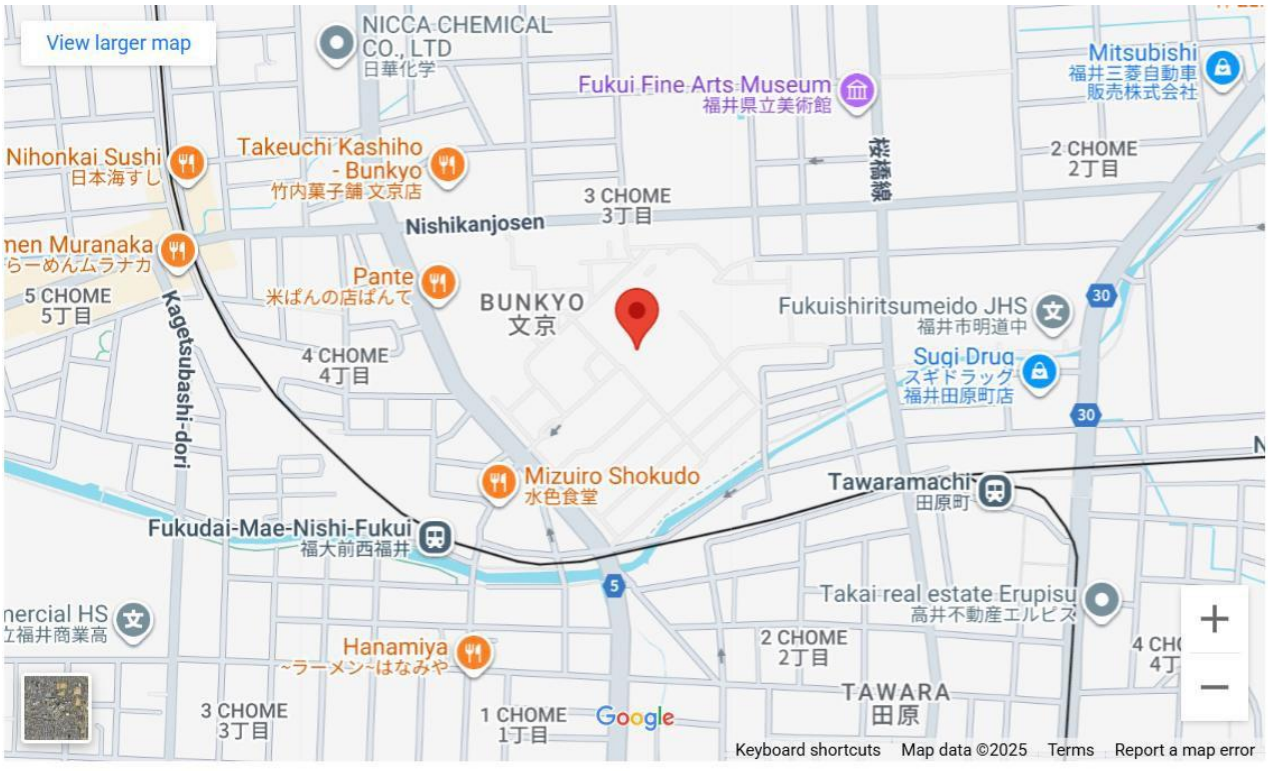
From Fukui Station → Fukudaimae-Nishifukui Station (¥160)

- **By Bus / Smile Bus (Tawara–Bunkyo Route)**

From Fukui Station → Tawaramachi Shopping Street (¥100)

- **By Bus / Keifuku Bus (Shintentuka / Driving Education Center Line)**

From Fukui Station → University of Fukui-mae (¥200)



About Fukui

Fukui City (福井) is the capital of Fukui Prefecture along the Sea of Japan. While Fukui's city center does not offer many major tourist attractions, multiple sites of interest are found in the forested hills and along the rocky coastlines outside of the city. Foremost among them is Eiheiji Temple, a headquarter of Zen Buddhism. Furthermore, there is the Fukui Dinosaur Museum, one of the best museums of its type in the world.

During the Era of Warring States, the region was ruled by the influential Asakura Clan with a bustling castle town at Ichijodani outside of today's city center. The clan was eventually defeated by Oda Nobunaga and the castle town destroyed. In contrast, Maruoka Castle has survived the feudal and post-feudal era without being destroyed, making it one of only twelve original castles left in Japan.

- **Eiheiji**

Eiheiji (永平寺) is a large temple complex and active monastery standing on a cedar-covered slope in the mountains just outside Fukui City.

- **The Fukui Prefectural Dinosaur Museum**

The Fukui Prefectural Dinosaur Museum (福井県立恐竜博物館, Fukui Kenritsu Kyōryū Hakubutsukan) is an excellent museum dedicated to dinosaur research and education. It is recognized as one of the top dinosaur museums in the world, and is the largest of its kind in Japan.

- **Maruoka Castle**

Maruoka Castle (丸岡城, Maruokajō), is one of just twelve castles remaining in Japan that have survived the post feudal ages with their castle keeps (donjon) intact.

(From: https://www.japan-guide.com/e/e6600.html)

Hotel Recommendation-Fukui

Recommended Hotels

Distances shown are estimated walking times

Hotel Name	**from Fukui International Activities Plaza**	**from JR Fukui Station (West Exit)**
Fukui Phoenix Hotel	5-minute walk	3-minute walk
Hotel Fukui Castle	6-minute walk	5-minute walk
Toyoko Inn Fukui Station	12-minute walk	2-minute walk
Hotel Route-Inn Fukui Ekimae	12-minute walk	2-minute walk
Courtyard by Marriott Fukui *August 23 Banquet's Venue	12-minute walk	directly connected

Program at a Glance

（Japanese Stadard Time, UTC+09:00）

Aug. 19, 2025, Tuesday

- Ibaraki Campus, Ritsumeikan University， Osaka
- Kyoto

Arrive in Osaka

Aug. 20, 2025, Wednesday

Time	Program	Room
9:30-11:30	● Academic Exchange at Intelligent Image Processing Lab ● Campus tour	Entrance of H Building, Ibaraki Campus, Ritsumeikan University
11:30-13:00	Lunch (Self-funded)	The campus cafeteria or local restaurants nearby
13:00-17:00	Kyoto Visit (Suggested destinations: Kyoto University, Ritsumeikan University Kinugasa Campus, etc.; followed by free time for individual activities)	Kyoto

Aug. 21, 2025, Thursday

- Fukui International Activities Plaza

Time	Program	Room
17:30-19:30	Onsite Registration	3F-SCR
18:30-20:00	Welcome Reception	3F-SCR

Aug. 22, 2025, Friday

- Fukui International Activities Plaza

Time	Program	Room
9:30-10:00	Play ICCSE's Promo Video	3F-SCR
10:00-10:30	**Opening Ceremony**	
10:30-11:20	**Keynote Speech I** Prof. Motoharu Fujigaki (Optical Measurement, University of Fukui, Japan)	3F-SCR
11:20-11:50	Tea Break	2F-1st&2nd MTG Room

11:50-12:40	**Keynote Speech II** Ryohei Hasegawa (Kansei Engineering, National Institute of Advanced Industrial Science and Technology, Japan)	3F-SCR
12:40-13:40	Lunch	2F-1st&2nd MTG Room
Time	**Program**	**Room**
13:40-14:30	**Keynote Speech III** Prof. HONG Wenxing (Xiamen University, China.)	3F-SCR
14:30-16:00	**Special Workshop 2:** *Quantitative and Neurocognitive Analyses in Language, Behavior, and Brain Function*	2F-3rd MTG Room
	Invited Session 1: *Building Science Popularization Educational Resources in the Age of AI*	3F-SCR
16:00-16:30	Tea Break	2F-1st&2nd MTG Room
16:30-18:30	**Special Session:** *Best Paper Candidates*	3F-SCR
	Invited Session 3: *Innovation and Practice in AI Education and Teaching*	2F-3rd MTG Room
Aug. 23, 2025, Saturday ● Fukui International Activities Plaza		
Time	**Program**	**Room**
9:30-10:30	**Special Workshop 1:** *The Expanding Role of Imaging: Understanding Aging, Supporting Diagnosis, Guiding Therapy*	3F-SCR
	Parallel Discussion 1: *Computer science and Data science*	2F-3rd MTG Room
10:30-11:00	Tea Break	3F-SCR
11:00-12:00	Parallel Discussion 2: *New digital technology's application*	2F-3rd MTG Room
12:00-13:00	Lunch	3F-SCR
14:00-14:30	Demo Instruction and University of Fukui -Video	3F-SCR
14:30-17:00	Mini Lab Activities (3 Booths)	2F-3rd MTG Room
	Mini Lab Activities (2 Booths)	3F-SCR

19:00-21:00	**Best Paper Award Closing Ceremony Banquet**	Fukui Marriott Hotel, 4F Fuyo

Aug. 23, 2025, Saturday
- Online

Time	Program	Voov Meeting
8:00-10:00	Invited Session 2: *AI-enabled Computer Practice Teaching*	Online Room 1 (617-124-812)
	Invited Session 4: *Cultivating Computational and Mathematical Thinking through Solving Problems by Programming*	Online Room 2 (771-620-856)
	Parallel Discussion 3: *New digital technology's application*	Online Room 3 (737-887-245)
10:00-10:10	Break	
10:10-12:10	Parallel Discussion 4: *Pedagogical strategies for education digital transformation*	Online Room 1 (617-124-812)
	Parallel Discussion 5: *Online learning and MOOCs*	Online Room 2 (771-620-856)
	Parallel Discussion 6: *E-Society*	Online Room 3 (737-887-245)

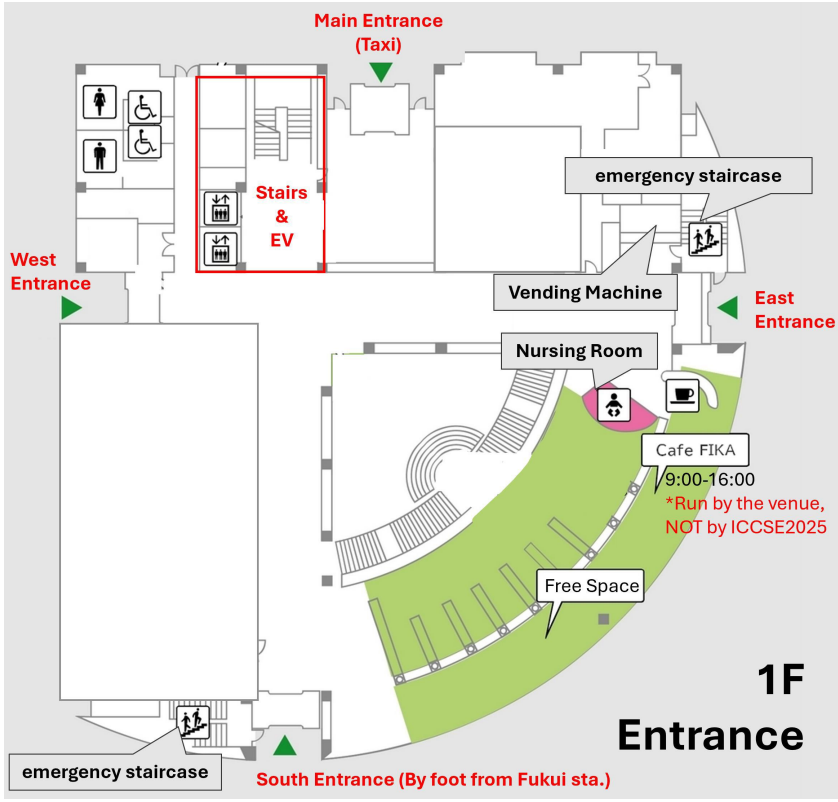
Aug. 24, 2025, Sunday Program
- **Online**

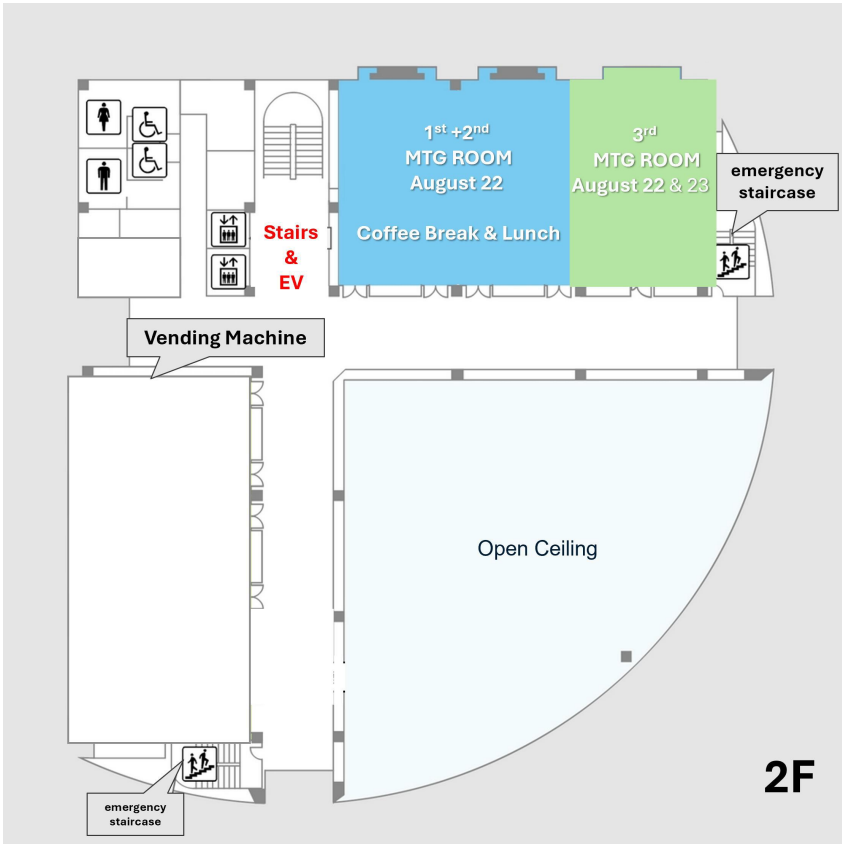
Time	Program	Voov Meeting
8:00-10:00	Online Poster session 1	Online Room 1 (870-474-012)
10:15-12:00	Online Poster session 2	Online Room 2 (986-633-204)

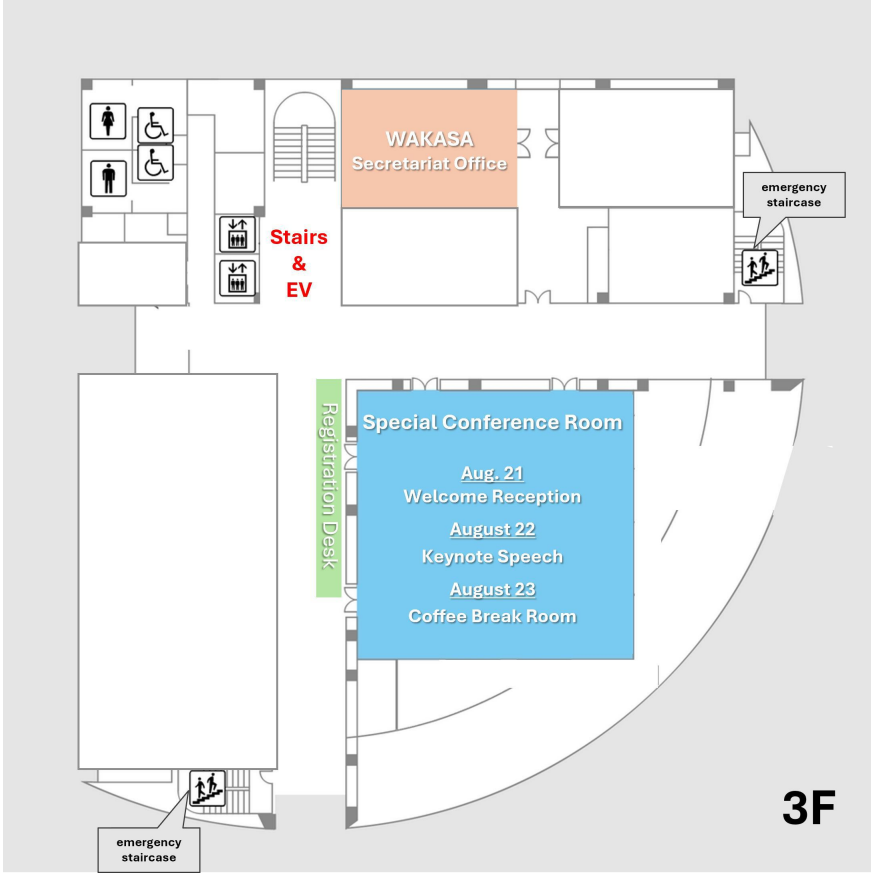
Aug. 25, 2025, Monday The conference end.

Map of Fukui International Activities Plaza

- **Fukui International Activites Plaza**

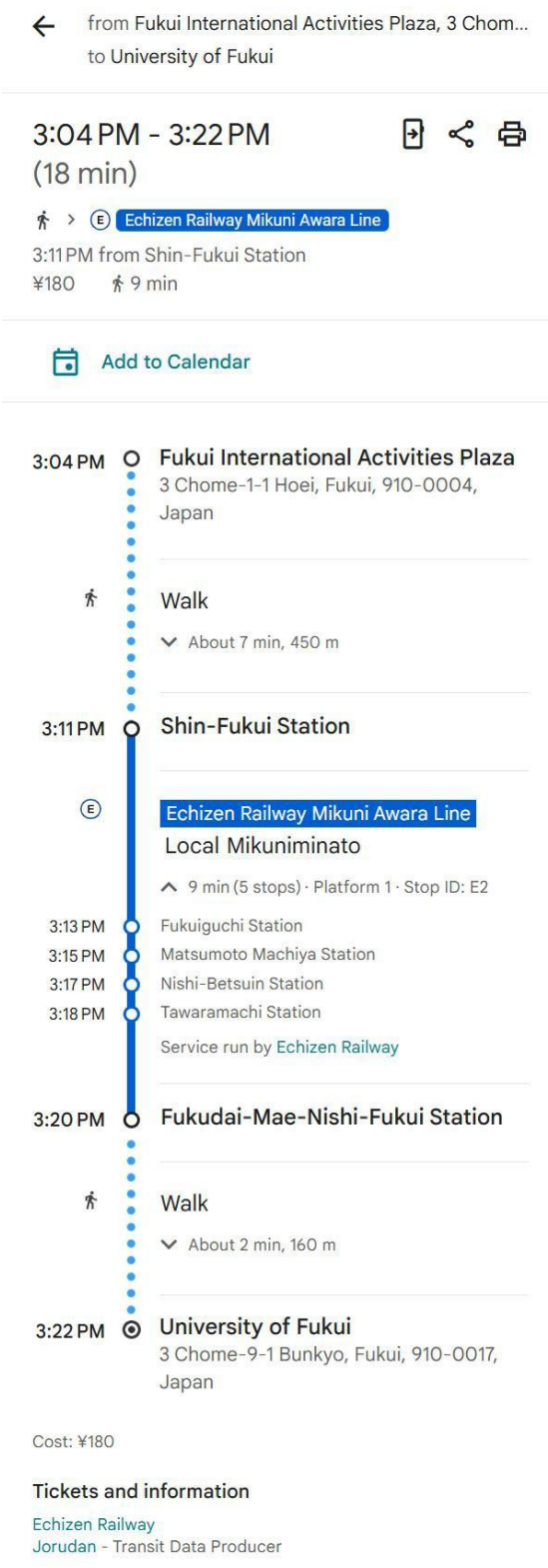


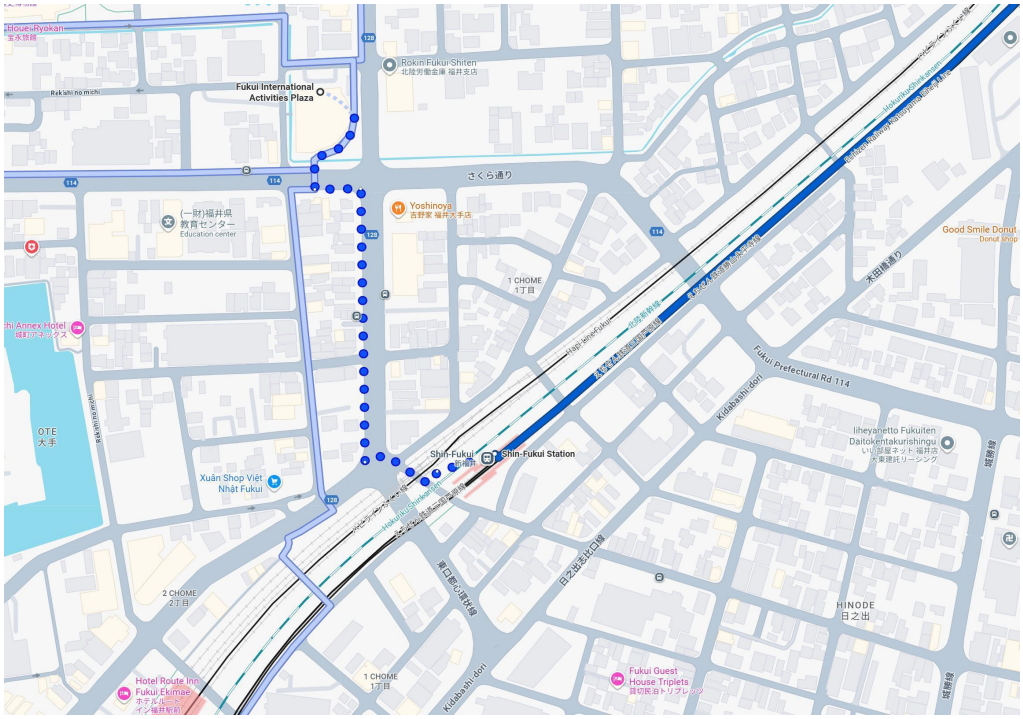



WAKASA
Secretariat Office
Stairs
&
EV
emergency
staircase
Registration Desk
Special Conference Room
Aug. 21
Welcome Reception
August 22
Keynote Speech
August 23
Coffee Break Room
emergency
staircase
3F

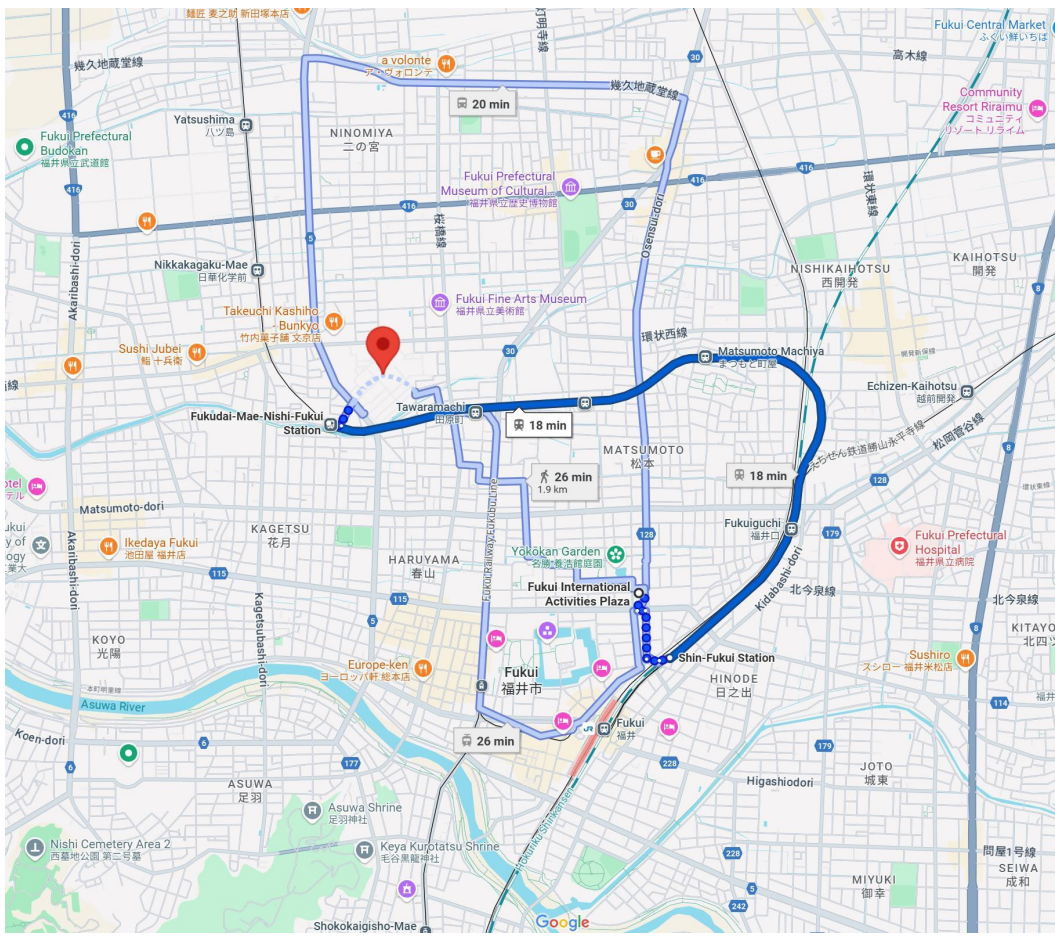
- **From Fukui International Activities Plaza to University of Fukui (about18-20min)**

By Railway-Echizen Railway Mikuni Awara Line(越前铁路三国芦原线)





To Shin-Fukui Station

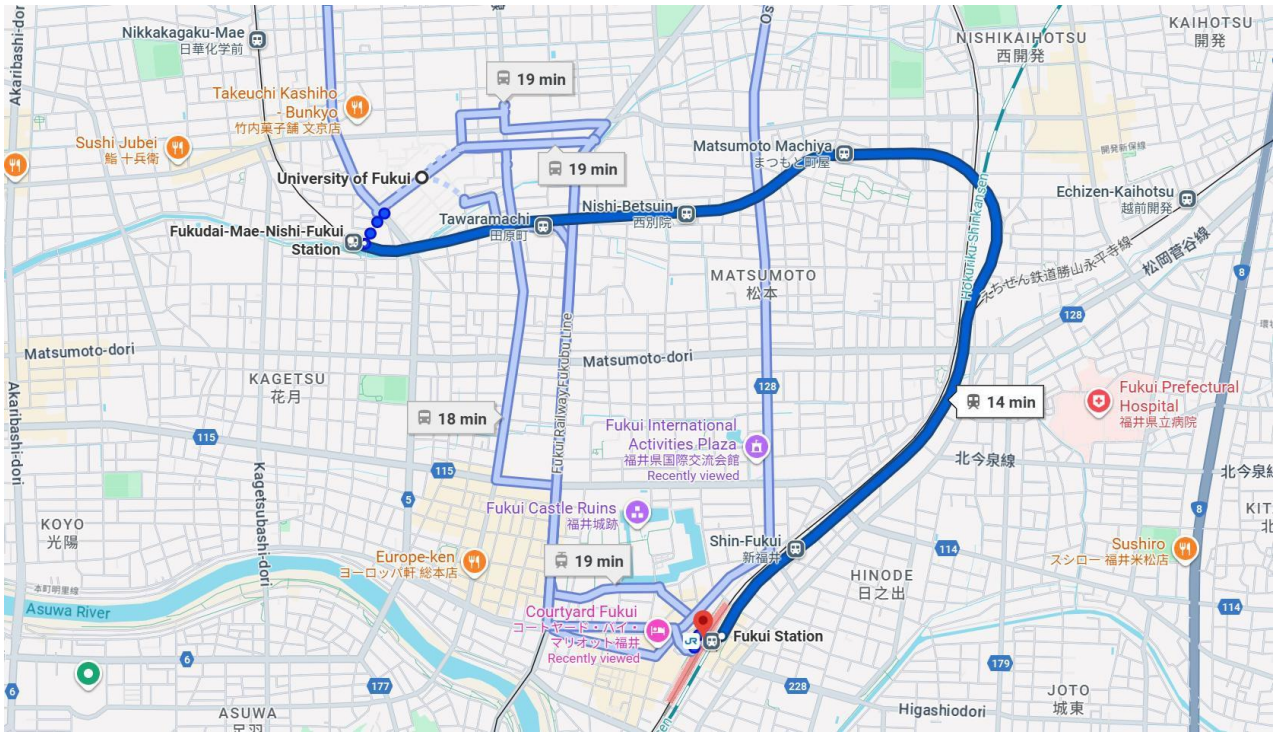


Train route

- **From University of Fukui to -Fukui Marriott Hotel-Banquet (about 13 min)**

By Railway-Echizen Railway Mikuni Awara Line(越前铁路三国芦原线)

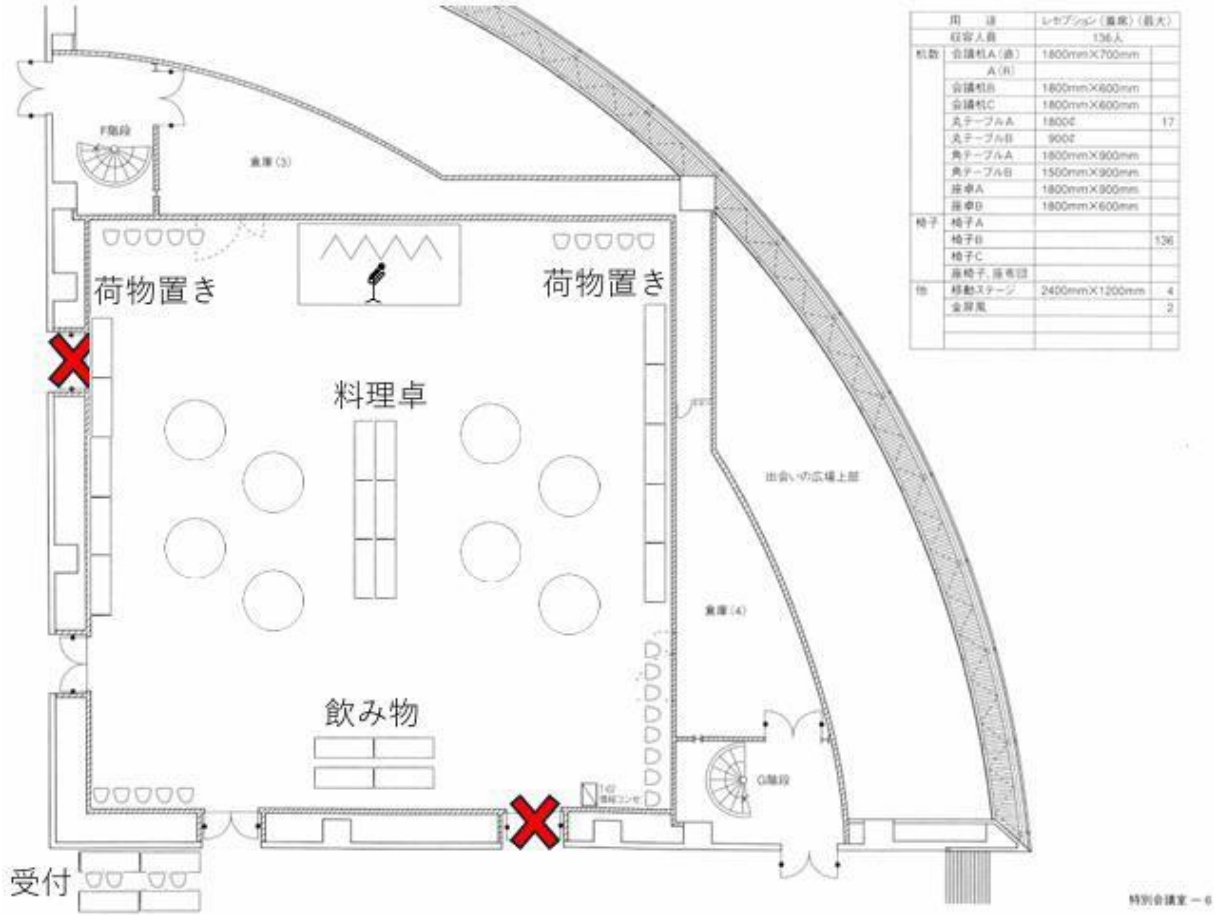
To Fukudai-Mae-Nishi-Fukui Station



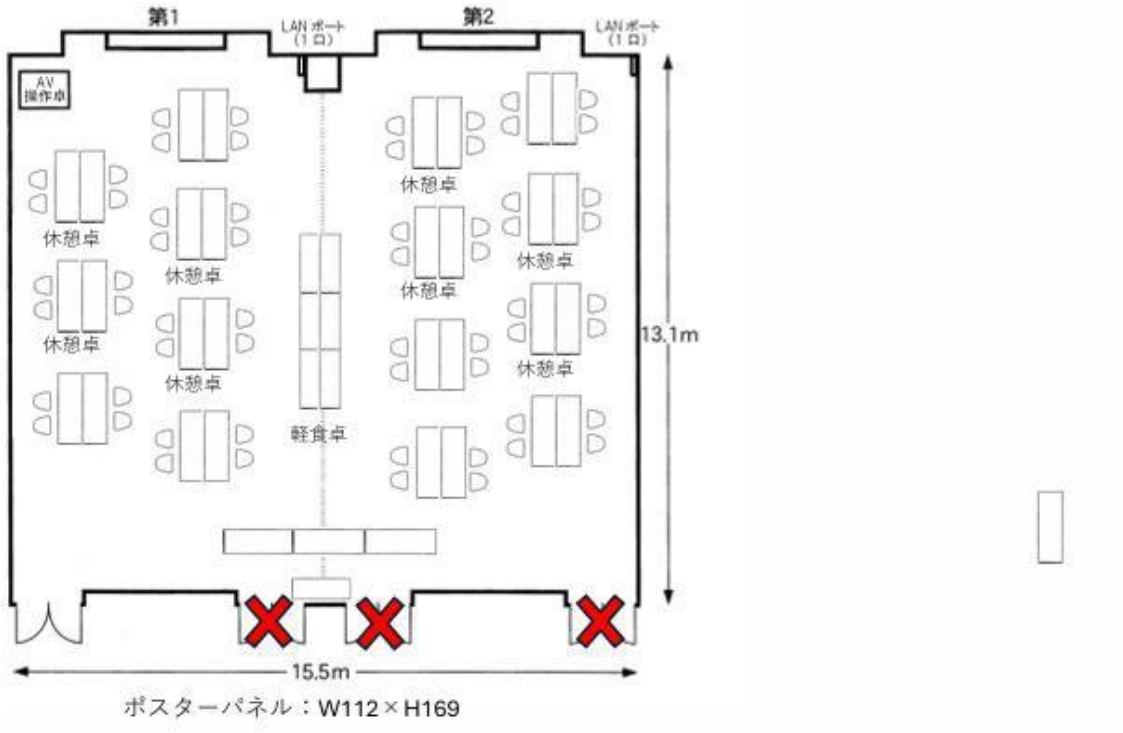
Train route

- **Venue Layout**

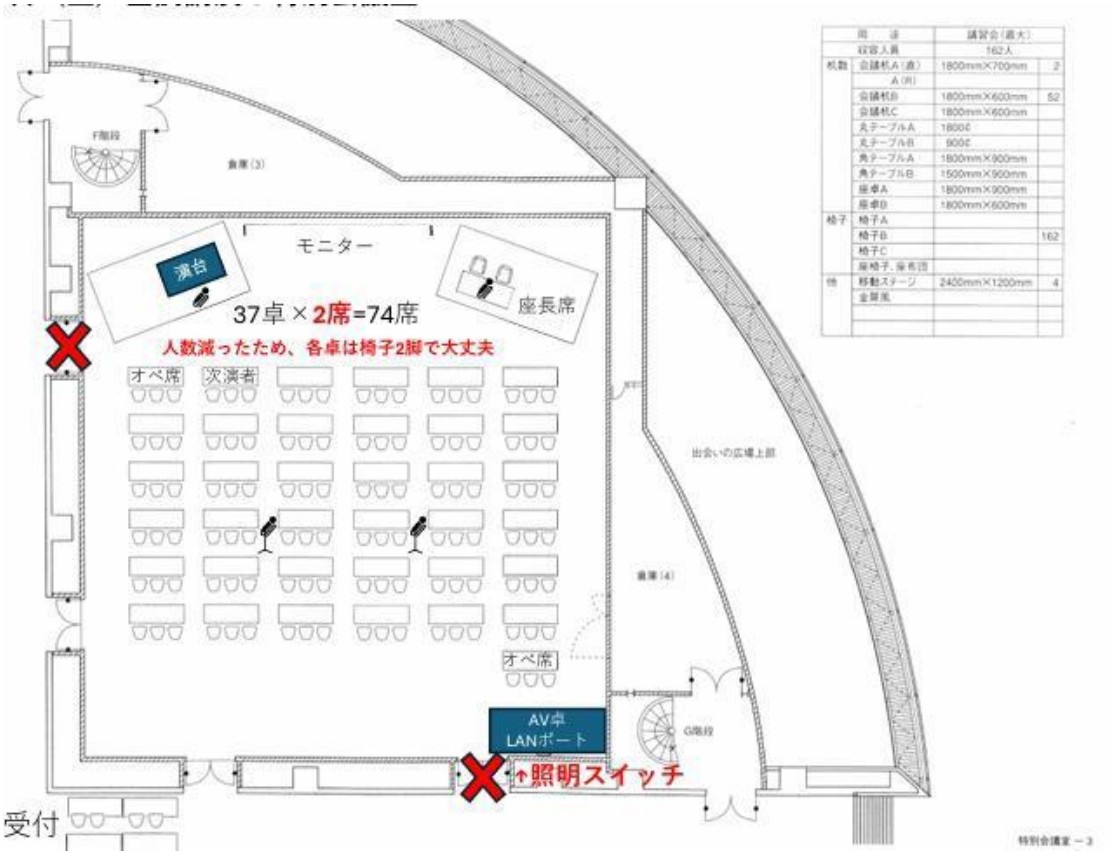
- ***8月21日（木）ウェルカムレセプション@特別会議室***



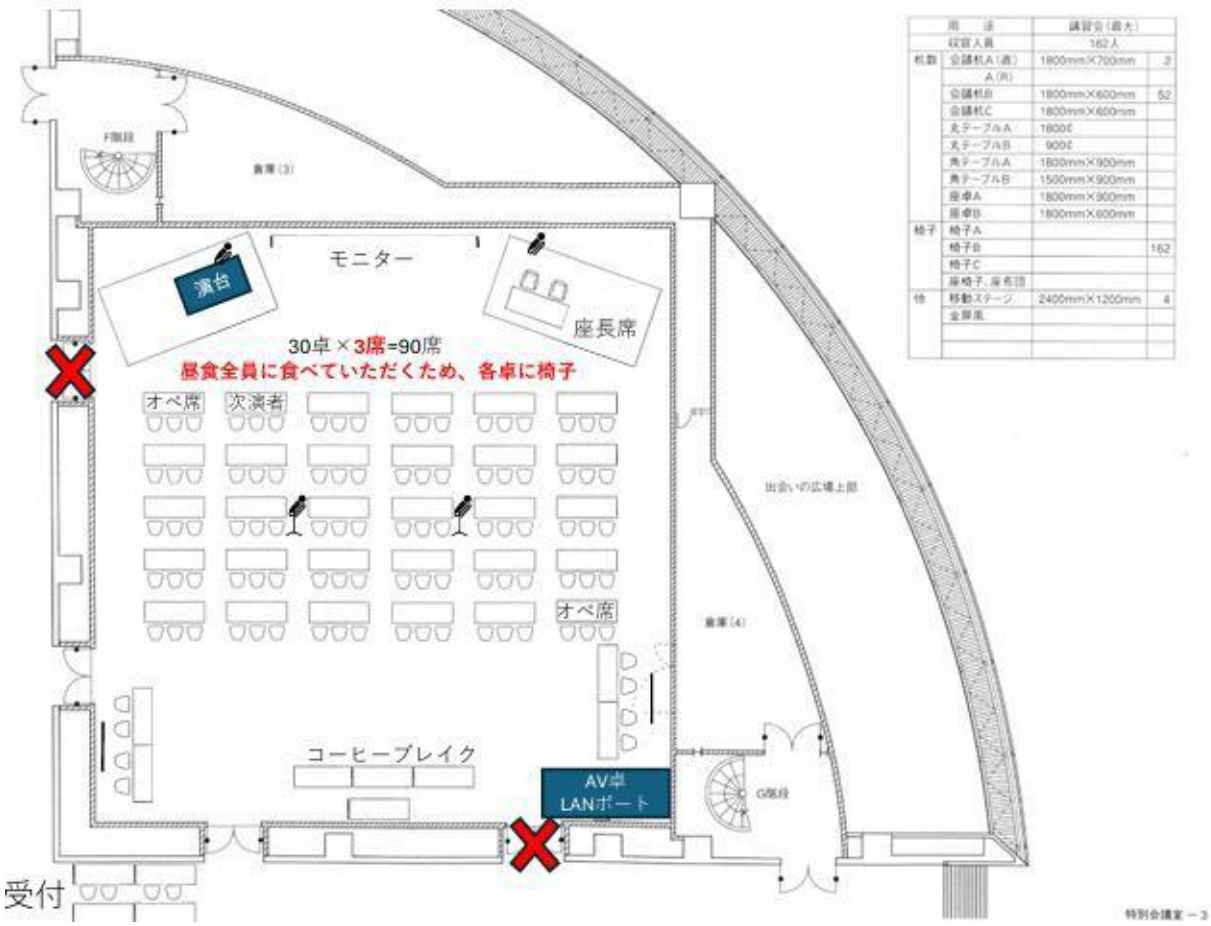
- ***8月22日（金）休憩室（コーヒーブレイク、昼食）***



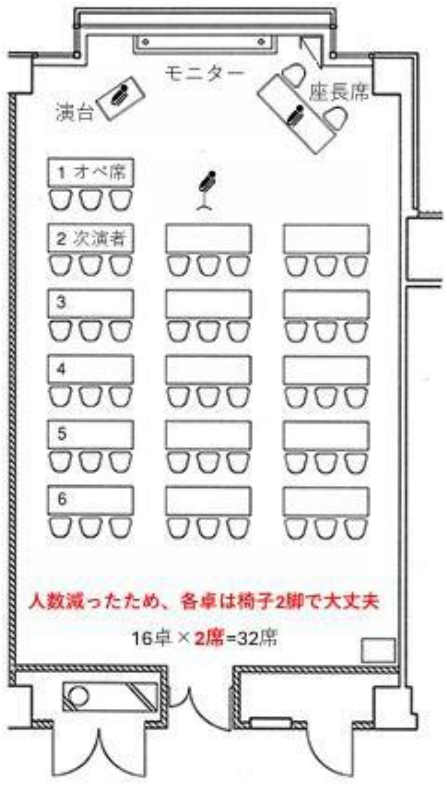
- *8月22日（金）基調講演@特別会議室*



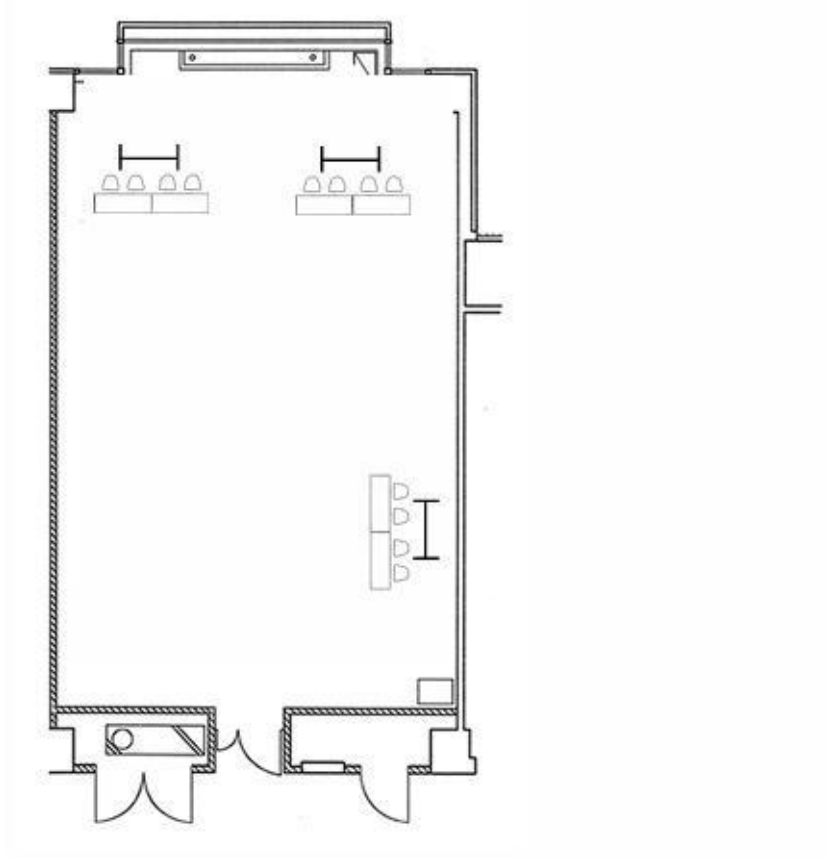
- *8月23日（土）セッションルーム@特別会議室*



- *8*月*22*日（金）＆*8*月*23*日（土）セッションルーム@第３会議室–午前中



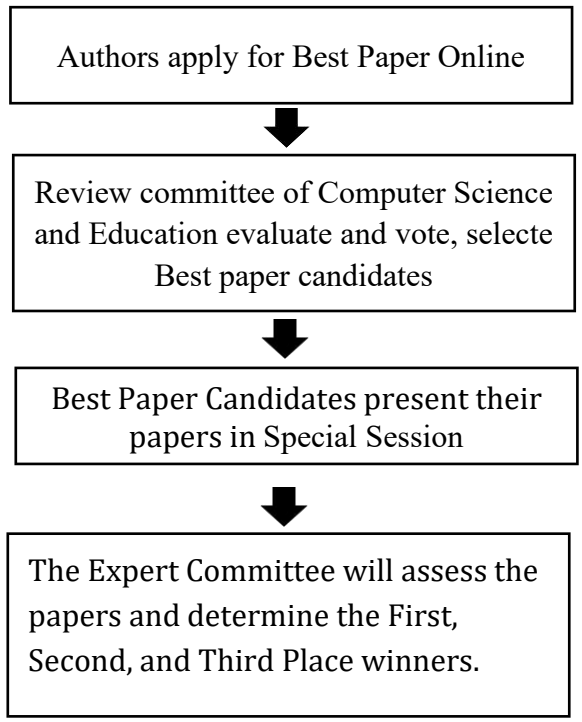
- *8*月*23*日（土）セッションルーム@第 3 会議室–午後転換後



Best Paper Award

We will select Best Paper Awards in the International Conference on Computer Science and Education annually. How is the Best paper selected? The figure below illustrates the process of Best Paper Award evaluation.

First, authors may apply to participate in the Best Paper selection by sending a request to the conference email. The Review Committee of Computer Science and Education will evaluate and vote on the submitted papers to select the Best Paper candidates. These candidates will then present their papers in a Special Session. The Expert Committee will assess the presentations and determine the First, Second, and Third Place winners. The Conference General Chair will present the awards during the conference banquet.



The processing of Best Paper selection

Introduction of Presentations, ICCSE 2025

(Oral & Online Oral & Poster)

ICCSE aims to provide an open and effective platform to exchange the ideas. Generally, all accepted papers should be presented in one of the three methods: a. Oral Presentation, b. Online Oral Presentation, c. Poster Presentation.

Oral Presentation:

1. Session Number: Special Workshops; Invited Sessions; Special Session; Parallel Session 1-2.
2. Oral Presentation Time: 15 minutes, including discussion. (Please check your schedule in technical program)
3. Each speaker is required to meet his/her session chairs in the corresponding session rooms 10 minutes before the session starts and copy the PPT/PDF file to the computer.
4. Each session room is equipped with a projector and a laptop (with Microsoft Windows, Microsoft Power-Point, and PDF reader). Please make sure that your files are compatible and readable with our operation system by using commonly used fonts and symbols.

Online Oral Presentation:

5. Session Number: Parallel Session 3-6.
6. Online Oral Presentation Time: 15 minutes, including discussion. (Please check your schedule in technical program)
7. Each speaker is required to make the presentation online. The online session will be held via Tencent Meeting (in China)or VooV (outside of China) .

Online Poster Presentation:

8. Session Number: Online Poster Session 1-2.
9. All the author of online poster session should prepare a 10-min video and display online.
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2025 19th International Conference on Computer Science & Education (ICCSE 2025)

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Fees Notes:

Categories		Rates (USD)	Paper Upload	Attendee
Early Bird Registration Before Jun.30,2025	Author	550	1	1
	Author(Member of CERSCE)	500	1	1
	Author(Student)	500	1	1
	Author(University of Fukui)	500	1	1
	Non-author Participants	400	0	1
Regular Registration After Jun.30,2025	Author	600	1	1
	Author(Member of CERSCE)	550		
	Author(Student)	550	1	1
	Author(University of Fukui)	550		
	Non-author Participants	450	0	1
Other Registration Items	Additional Paper *A registration combo only could cover two papers at most.	450	1	1
	Additional Author(For a single paper with multiple authors registering): •The first author will be charged at the standard paper registration rate. •Subsequent co-authors will be charged at the Non-author Participants rate.	450	1	1
	Extra Page Levy (papers exceeding 15 pages)	60/page	Each paper registration already includes one pack.	---
	Extra Banquet Fee (For unregistered accompanying	80	For unregistered accompanying persons	---

a The registration fee covers: admission to all sessions, admission to the exhibition, conference kit, a hard copy of the program book, and a USB drive with conference proceedings （ **The final list is subject to the actual arrangements of the conference for that year.** ） **. All** accepted papers will be published in the Springer LNCS series.

b All papers' registration fees should be paid before **July 15**, 2025. Registration is not confirmed until payment is received. Otherwise, the paper will not be included in the

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Annex: Registration Form (Next page)

Annex: Registration Form

***** ICCSE 2025 REGISTRATION FORM *****

The 19th International Conference on Computer Science & Education
August 19-24, 2025. Osaka, Fukui, Japan.

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Section I:

Delegate's Information	
(1) Number of Participants	If there are 2 or more authors will attend the conference, repeat (2)-(6) below yourself.
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Fees (Refer to REGISTRATION RATES Table in Page 1)				
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Section III:

Screenshots or scanned documents of payment vouchers:

Session Chairs Index

SessionTitle	Session#	Topic	Presentation	Chair	Co-Chair	Time	Room
Special Workshop 2	SpW 2	Quantitative and Neurocognitive Analyses in Language, Behavior, and Brain Function	Oral			Aug 22, 14:30-16:00	2F-3rd MTG Room
Invited Session 1	InS 1	Building Science Popularization Educational Resources in the Age of AI	Oral	ZHOU Wei	CHEN Yulin QIANG Yan		3F-SCR
Special Session	SpS 1	Best Paper Candidates	Oral	CUI Binyue	WENG Yang	Aug 22, 16:30-18:30	3F-SCR
Invited Session 3	InS 3	Innovation and Practice in AI Education and Teaching	Oral	LUO Juan	ZHAO Huan CAI Yuhui		2F-3rd MTG Room
Special Workshop 1	SpW 1	The Expanding Role of Imaging: Understanding Aging, Supporting Diagnosis, Guiding Therapy	Oral			Aug 23, 9:30-10:30	3F-SCR
Parallel Discussion 1	PaD 1	Computer science and Data science	Oral	SHENG Yu	Katsuyuki Umezawa		2F-3rd MTG Room
Parallel Discussion 2	PaD 2	New digital technology's application	Oral			Aug 23, 11:00-12:00	2F-3rd MTG Room
Invited Session 2	InS 2	AI-enabled Computer Practice Teaching	Online	Dapeng Qu		Aug 23, 8:00-10:00	Online Room 1
Invited Session 4	InS 4	Cultivating Computational and Mathematical Thinking through Solving Problems by Programming	Online	WU Yonghui			Online Room 2
Parallel Discussion 3	PaD 3	New digital technology's application	Online				Online Room 3
Parallel Discussion 4	PaD 4	Pedagogical strategies for education digital transformation	Online			Aug 23, 10:10-12:10	Online Room 1
Parallel Discussion 5	PaD 5	Online learning and MOOCs	Online				Online Room 2
Parallel Discussion 6	PaD 6	E-society	Online				Online Room 3
Online Poster Session 1	PoS 1		Online			Aug 24, 8:00-10:00	Online Room 1
Online Poster Session 2	PoS 2		Online			Aug 24, 10:15-12:00	Online Room 2

Technical Program

Special Workshop 1: The Expanding Role of Imaging: Understanding Aging, Supporting Diagnosis, Guiding Therapy | **Saturday** | **Aug. 23** | **9:30-10:30** | **3F- SCR**

Title	Authors	Session	Room	Date	Start	End
CT-image guided proton radiotherapy and related research aiming for adaptive treatment	Yoshikazu Maeda, Yoshitaka Sato, Kenji Kobashi, Masazumi Katayama, Hiroki Takada, Keiichiro Matsushita, Makoto Sasaki, Hiroyasu Tamamura And Kazutaka Yamamoto	SpW 1.1	3F-SCR	Aug. 23	9:30	9:50
Nuclear Medicine and Deep Learning: Utilizing AI for Patient-Friendly Imaging	Akinobu Kita	SpW 1.2	3F-SCR	Aug. 23	9:50	10:10
Visualizing Visual Function and Aging Using fMRI	Akihiro Sugiura, Yuta Umeda, Saki Hayakawa, Yuna Takagi, Masahiro Suzuki, Masami Niwa, Kunihiko Tanaka And Hiroki Takada	SpW 1.3	3F-SCR	Aug. 23	10:10	10:30

Special Workshop 2: Quantitative and Neurocognitive Analyses in Language, Behavior, and Brain Function | **Friday** | **Aug. 22** | **14:30-16:00** | **2F-3rd MTG Room**

Title	Authors	Session	Room	Date	Start	End
Quantitative Analysis of Dialogue Dynamics: Tracking Emotional Shifts in Green Book Through Morphological Parsing	Sana Domae, Kakeru Amano, Akira Hasegawa And Yasuyuki Matsuura	SpW 2.1	2F-3rd MTG Room	Aug. 22	14:30	14:50
High-speed Reading Aloud as a Pedagogical Strategy for Enhancing Cognitive and Expressive Language Skills in Non-Kanji Background Learners	Kenichiro Kutsuna, Kunaj Somchanakit, Yoko Honda And Hiroki Takada	SpW 2.2	2F-3rd MTG Room	Aug. 22	14:50	15:10
A Study on the Effect of Covert Attention on Microsaccade Direction	Fumiya Kinoshita	SpW 2.3	2F-3rd MTG Room	Aug. 22	15:10	15:30

Invited Session 1: Building Science Popularization Educational Resources in the Age of AI | **Friday** | **Aug. 22** | **14:30-16:00** | **3F-SCR**

Chair: ZHOU Wei

Co-Chair: CHEN Yulin, QIANG Yan

Title	Authors	Session	Room	Date	Start	End
Changes in tourism topics in Southeast Asia: A Machine Learning-Based Analysis of Tourism UGC	Yulin Chen, Yanting Tong, Binyue Cui And Wei Zhou	InS 1.1	3F-SCR	Aug. 22	14:30	14:45
Design and Practice of Railway Track Visual Detection Science Popularization Teaching AIDS for Youngsters	Wenjuan Peng	InS 1.2	3F-SCR	Aug. 22	14:45	15:00
Application Virtualization Based Network Simulation Experiment Platform	Zhifei Zhang, Shize Tang, Wei Zhou And Ke Xiong	InS 1.3	3F-SCR	Aug. 22	15:00	15:15
A Unified Digital Twin Platform for the Experiment Education of "The 101 Plans" Hardware Courses	Yu Huang, Zonghui Li, Ke Xiong And Ziyao Shen	InS 1.4	3F-SCR	Aug. 22	15:15	15:30
Research on Key Algorithms for Text Auto-Correction Based on DeepSeek	Yuejuan Wei, Bin Zhang, Qing Li And Yan Qiang	InS 1.5	3F-SCR	Aug. 22	15:30	15:45

Invited Session 2: AI-enabled Computer Practice Teaching | **Saturday** | **Aug. 23** | **8:00-10:00** | **Online Room 1**

Chair: Dapeng Qu

Title	Authors	Session	Room	Date	Start	End
Large Language Model Helps the Teaching Reform of Programming	Zhan Tang, Xiaoli Peng, Xiaoyu Lu And Nian Yang	InS 2.1	Online Room 1	Aug. 23	8:00	8:15
GPE-DKT: An Enhanced Deep Knowledge Tracing Model Integrating Generalized Training and Personalized Fine-Tuning for Learning Assessment	Xin Dong, Qing Zhang And Dapeng Qu	InS 2.2	Online Room 1	Aug. 23	8:15	8:30
Research on the Practice of a Three-Dimensional Teaching Innovation System Empowered by AI in the Java Programming Course	Ze Yang, Xuejuan Chen And Yali Shao	InS 2.3	Online Room 1	Aug. 23	8:30	8:45
Collaborative Construction of Computational Thinking and Digital Thinking Empowered by Programming Agents from the Perspective of "Integrating Morality and Skills" — A Case Study of Judicial Police Colleges	Zongmei Liu And Jianxin Tan	InS 2.4	Online Room 1	Aug. 23	8:45	9:00
Knowledge Graph-Driven Education Framework: A Case Study of Introduction to Computer Science Course	Chenlu Zhuansun, Yuan Liu, Qiang He, Qinglin Yang, Pengdeng Li, Gongxuan Zhang And Zhihong Tian	InS 2.5	Online Room 1	Aug. 23	9:00	9:15

Invited Session 3: Innovation and Practice in AI Education and Teaching | **Friday** | **Aug. 22** | **16:30-18:30** | **2F-3rd MTG Room**

Chair: LUO Juan

Co-Chair: ZHAO Huan, CAI Yuhui

Title	Authors	Session	Room	Date	Start	End
Integration of Computational Thinking and Artificial Intelligence in General Education: A Case Study of "Introduction to Computing and Artificial Intelligence" at Hunan University	Yuhui Cai And Juan Luo	InS 3.1	2F-3rd MTG Room	Aug. 22	16:30	16:45
Automatic Coding Application and Practical Research on Classroom Dialogue	Tengda Qi, Jun He, Bo Sun, Wang Ruan And Guomin Zheng	InS 3.3	2F-3rd MTG Room	Aug. 22	16:45	17:00
Exploration and Practice of Aesthetic Education in College Computer Courses from the Perspective of AI	Yu Niefang, Li Xiaomei And Peng Xiaoning	InS 3.4	2F-3rd MTG Room	Aug. 22	17:00	17:15

Invited Session 4: Cultivating Computational and Mathematical Thinking through Solving Problems by Programming | **Saturday** | **Aug. 23** | **8:00-10:00** | **Online Room 2**

Chair: WU Yonghui

Title	Authors	Session	Room	Date	Start	End
Exploring an Intelligent and Innovative Programming Teaching Model Based on Agent Programming Paradigm	Xin Xie, Yuantao Chen, Lixia Luo And Yonghui Cui	InS 4.1	Online Room 2	Aug. 23	8:00	8:15
Computational Thinking Curriculum Design: A Triadic Integration of Listening, Teaching, and Practicing	Juan Zhou, Yonghui Wu, Zhiwei Zhang, Hui Luo, Xiong Li And Nan Xiao	InS 4.2	Online Room 2	Aug. 23	8:15	8:30
Interesting Teaching of Algorithm Courses Supported by Syllabus, Textbooks and Cases	Xiong Li, Kun Rao, Hui Song And Juan Zhou	InS 4.3	Online Room 2	Aug. 23	8:30	8:45

Special Session: Best Paper Candidates | **Friday** | **Aug. 22** | **16:30-18:30** | **3F-SCR**

Chair: CUI Binyue

Co-Chair: WENG Yang

Title	Authors	Session	Room	Date	Start	End
Construction and Practice of a Distinctive Science Popularization and Education Base for Artificial Intelligence and Future Transportation Technology—Taking Beijing Jiaotong University as an Example	Shouqiang Zhao, Ke Xiong, Wei Zhou And Wenjuan Peng	SpS 1.1	3F-SCR	Aug. 22	16:30	16:45
A Human-AI Collaborative Strategy for Project-Based Learning Using Large Language Models	Yuan Fang, Weizhen Wang, Shikai Guo, Mingjian Liu And Xiang Li	SpS 1.2	3F-SCR	Aug. 22	16:45	17:00
An Agent-Driven Programming Learning Support System Based on Proactive Insight Agent	Haojie Shi, Haoran Yang, Wenyi Xie, Ruobin Wang And Fengxia Li	SpS 1.3	3F-SCR	Aug. 22	17:00	17:15

Application of Image Recognition Technology Helping to Understand Quantum Chaos in the Semiclassical Regime	Hiromu Ishio	SpS 1.4	3F-SCR	Aug. 22	17:15	17:30
Comparative Analysis of Translator Styles in Lu Xun's Works using Text Mining	Kokoro Chaya, Kakeru Amano, Akira Hasegawa And Yasuyuki Matsuura	SpS 1.5	3F-SCR	Aug. 22	17:30	17:45
High-Frequency EEG Biomarkers of Cognitive Function Revealed by Wavelet Analysis	Kakeru Amano, Yasuyuki Matsuura, Kuwon Sumi, Akihiro Sugiura, Hirofumi Tahara And Hiroki Takada	SpS 1.6	3F-SCR	Aug. 22	17:45	18:00
Toward System- and Theory-Oriented Talent Cultivation in Computing	Yu Zhang	SpS 1.7	3F-SCR	Aug. 22	18:00	18:15
Cultivating Computational and Mathematical Thinking by Solving Programming Contest Problems	Yonghui Wu And Juan Zhou	SpS 1.8	3F-SCR	Aug. 22	18:15	18:30

Parallel Discussion 1: Computer science and Data science **Saturday** **Aug. 23** **9:30-10:30** **2F-3rd MTG Room**

Chair: SHENG Yu

Co-Chair: Katsuyuki Umezawa

Title	Authors	Session	Room	Date	Start	End
Development of a Web-based Software Application for the Longevity Extension Research	Sena Seneviratne, Udaya Seneviratne Seneviratne, Yashas Mallawarachchi And Aditya Abeysinghe	PaD 1.1	2F-3rd MTG Room	Aug. 23	9:30	9:45
A Scientific Training Procedure for Attaining Fluency in Stress time language using Computer Assisted Language Learning	Sena Seneviratne, Judith Beveridge, Aditya Abeysinghe And Liyanage De Silva	PaD 1.2	2F-3rd MTG Room	Aug. 23	9:45	10:00
HAMFD: A Lane Line Detection Model with Hybrid Attention Based on Multi-Feature Regression at Different Scales	Siwei Wei, Can Zhou, Jinhang Liu, Wang Chunzhi And Lingyu Yan	PaD 1.3	2F-3rd MTG Room	Aug. 23	10:00	10:15
Construction and Practice of Digital Literacy Teaching Quality Improvement Model with Double Helix Structure	Ning Wang, Mingming Chen And Liqing Guo	PaD 1.4	2F-3rd MTG Room	Aug. 23	10:15	10:30

Parallel Discussion 2: New digital technology's application **Saturday** **Aug. 23** **11:00-12:00** **2F-3rd MTG Room**

Chair: SHENG Yu

Co-Chair: Katsuyuki Umezawa

Title	Authors	Session	Room	Date	Start	End
Visual Analytics of Student Behavior Patterns Based on Online Judge Log Data	Jiaxin Yu, Pengyang Zhu, Guihua Duan, Ping Zhong And Yu Sheng	PaD 2.1	2F-3rd MTG Room	Aug. 23	11:00	11:15
Comparison of Nervousness Levels in Interpersonal and ChatGPT-based Learning for Cambodian Language Acquisition	Katsuyuki Umezawa, Toun Akyra, Makoto Nakazawa, Michiko Nakano And Shigeichi Hirasawa	PaD 2.2	2F-3rd MTG Room	Aug. 23	11:15	11:30
Design and Implementation of Bidirectional Intelligent Sign Language Recognition Gloves Based on Multi-Sensor Fusion and Artificial Intelligence	Guochen Zhang, Rui Wen, Qi Zhou, Gang Cen, Junyan Luo And Zhiqi Jin	PaD 2.3	2F-3rd MTG Room	Aug. 23	11:30	11:45
On the Design of AI Teaching Assistants for Algorithm Courses with Integrated Teaching, Learning, Assessment and Practice	Chao Peng, Kecheng Cai, Yaying Guo And Chenyang Xu	PaD 2.4	2F-3rd MTG Room	Aug. 23	11:45	12:00

Parallel Discussion 3: New digital technology's application **Saturday** **Aug. 23** **8:00-10:00** **Online Room 3**

Title	Authors	Session	Room	Date	Start	End
Speech Emotion Recognition Based on MGCC Features and ARIMA Algorithm	Hao Lou, Shaoping Shen, Tianle Zhang And Zhibin Li	PaD 3.1	Online Room 3	Aug. 23	8:00	8:15
Risk Assessment Study on Linkage Scenarios of Integrated Monitoring System Based on Fully Automatic Operation	Guo Changyou, Zhao Limin, Zheng Wenyan, Liu Shuai, Fu Guanhua And Liu Yidong	PaD 3.2	Online Room 3	Aug. 23	8:15	8:30
Design and Development of a General-Purpose Conversational System for Multi-Source Heterogeneous Data Analysis Powered by LLMs	Gangyi Zhang, Wengang Li, Xinzhou Ye, Gang Cen And Yuefeng Cen	PaD 3.3	Online Room 3	Aug. 23	8:30	8:45
The Design and Development of the AI Interviewer System	Xinzhou Ye, Zhehao Mou, Haonan Jiang, Yuefeng Cen And Gang Cen	PaD 3.4	Online Room 3	Aug. 23	8:45	9:00
Research on UAV path planning and obstacle avoidance integrating PPO and DWA	Zhidong Wang And Shaoping Shen Shen	PaD 3.5	Online Room 3	Aug. 23	9:00	9:15

Parallel Discussion 4: Pedagogical strategies for education digital transformation **Saturday** **Aug. 23** **10:10-12:10** **Online Room 1**

Title	Authors	Session	Room	Date	Start	End
Towards Next-Generation Computer Network Education: AI-Driven Reform	Jigang Wen, Kun Xie, Yuxiang Chen And Wei Liang	PaD 4.1	Online Room 1	Aug. 23	10:10	10:25
A Study on Teaching Models for Embedded Systems Courses Under the Guidance of Intelligent Educational Robots	Xiaochun Xu, Haibo Luo And Ping Fan	PaD 4.2	Online Room 1	Aug. 23	10:25	10:40
SS-GAN: a Text-to-Face Generation Method for Education Applications	Wang Hongxia, Wang Yu And Zhao Guanghui	PaD 4.3	Online Room 1	Aug. 23	10:40	10:55
Paths and Strategies for reshaping the Teaching Process of Software Engineering Courses under the background of AI	Gongzheng Lu And Yang Yang	PaD 4.4	Online Room 1	Aug. 23	10:55	11:10
AI-assisted discrete mathematics teaching platform based on multimodal learning resources	Hulin Kuang, Hongdong Li, Min Zeng And Jianxin Wang	PaD 4.5	Online Room 1	Aug. 23	11:10	11:25
Design and development of AIGC-based intelligent teaching assistance system	Lihan Jiang, Gangyi Zhang, Xiangdong Li, Zhiqi Jin And Yuefeng Cen	PaD 4.6	Online Room 1	Aug. 23	11:25	11:40
Teaching Reform of Computer Curriculum System for Cultivating Students' Computer System Ability	Xing Liu, Xing Liu, Jianjun Chen, Qinglan Zhan And Mengling Chen	PaD 4.7	Online Room 1	Aug. 23	11:40	11:55
Exploration of Data Science Course Teaching Based on the RAP Model	Wenxing Hong, Fan Xiao, Huan Wang and Binyue Cui	PaD 4.8	Online Room 1	Aug. 23	11:55	12:10

Parallel Discussion 5: Online learning and MOOCs **Saturday** **Aug. 23** **10:10-12:10** **Online Room 2**

Title	Authors	Session	Room	Date	Start	End
A Knowledge Graph-Based Study on the "Four-Step" Model for Practice-Oriented Teaching	Rui Wen, Yuefeng Cen, Jingjing Liang, Gangyi Zhang, Shuai Jiang And Gang Cen	PaD 5.1	Online Room 2	Aug. 23	10:10	10:25
Reflections on the Construction of Digital Courses for Older Adults Education	Junjie Cao And Zhonghua Jiang	PaD 5.2	Online Room 2	Aug. 23	10:25	10:40
Constructing a Transportation-Oriented Artificial Intelli-gence Curriculum System: A Core Competency Perspec-tive	Hui Luo, Wei Zeng And Linjuan Wei	PaD 5.3	Online Room 2	Aug. 23	10:40	10:55
Cultivating Four-Dimensional Core Competencies of Undergraduate AI Talents under the Emerging Engineering Education Framework	Hui Luo, Wei Zeng And Chongwei Huang	PaD 5.4	Online Room 2	Aug. 23	10:55	11:10
Analysis and Thinking about the Development Situation of HIS Course in Colleges of Traditional Chinese Medicine in China	Qingyan Wu, Haifeng Yang, Yan Xie And Wenping Deng	PaD 5.5	Online Room 2	Aug. 23	11:10	11:25
Practice Teaching Reform of Digital Circuit and Logic Design Course Guided by Hardware Thinking	Chunqing Ling, Huan Zhao, Hongping Hu And Yan Liu	PaD 5.6	Online Room 2	Aug. 23	11:25	11:40
Hybrid Online-offline Course Construction on "Compiler Principles"	Wenbi Rao, Yunhua Wang And Fuyang Li	PaD 5.7	Online Room 2	Aug. 23	11:40	11:55

Parallel Discussion 6: E-society		Saturday	Aug. 23	10:10-12:10	Online Room 3	
Title	**Authors**	**Session**	**Room**	**Date**	**Start**	**End**
CNN-Transformer for Tool Wear Condition Recognition Based on Data Augmentation	Luyao Yuan, Haotian Lei And Yang Weng	PaD 6.1	Online Room 3	Aug. 23	10:10	10:25
Leveraging Query Selection for Efficient Relationship Detection	Haotian Lei And Yang Weng	PaD 6.2	Online Room 3	Aug. 23	10:25	10:40
Implementation of A Procurement Demand Forecasting System Based on Dynamic Fusion of Multi-Source Data	Wei Zhou	PaD 6.3	Online Room 3	Aug. 23	10:40	10:55
Deep Attention Knowledge Tracing Based on Temporal Kolmogorov-Arnold Networks	Huamei Qi And Yalin Jing	PaD 6.4	Online Room 3	Aug. 23	10:55	11:10
A Integrated Supervisory Control System information security level protection technology solutions	Zhao Limin, Guo Changyou, Zheng Wenyan, Liu Shuai, Fu Guanhua And Liu Yidong	PaD 6.5	Online Room 3	Aug. 23	11:10	11:25
Research on Data Mining and Analysis Methods for Approved Foods for Special Medical Purposes in China	Zhouxuan Chen, Qianmeng Ruan, Gang Cen, Shuaijie Jiang And Yufan Chen	PaD 6.6	Online Room 3	Aug. 23	11:25	11:40
A Data Fusion and Sharing-Exchange Model for Public Health Emergency Management	Chao Li, Shuhui Wang, Jian Zhang, Xin Wei And Chunxiao Xing	PaD 6.7	Online Room 3	Aug. 23	11:40	11:55
Online Poster Session 1		**Sunday**	**Aug. 24**	**8:00-10:00**	**Online Room 1**	
Title	**Authors**	**Session**	**Room**	**Date**	**Start**	**End**
GAI-Empowered BOPPPS Teaching Model and Teaching Practice in Classroom Teaching Scenarios	Qingzheng Xu, Yufeng Ma, Na Wang, Weihu Zhao And Peilei Liu	PoS 1.1	Online Room 1	Aug. 24	8:00	8:15
Predicting the Impact of Artificial Intelligence on Employment Structure under Population Decline UsingMultivariate Regression	Changwei Yang And Mingzhi Mao	PoS 1.2	Online Room 1	Aug. 24	8:15	8:30
Intelligent Teaching Assistant System of Computer Systems Course Based on Large Language Model	Kehua Yang, Huan Zhao, Lida Huang, Xiongren Xiao, Guoxi Xie And Yang Xu	PoS 1.3	Online Room 1	Aug. 24	8:30	8:45
Innovation and Practice of the Full-process Management Framework for Graduate Education	Zhe Wang, Huiying Lv, Yuhong Zhong, Xiaohua Liu And Rui Zhang	PoS 1.4	Online Room 1	Aug. 24	8:45	9:00
AI-Enhanced Production-Oriented Approach for Feedback and Assessment in EFL Writing	Wenhan Pan, Mingzhi Mao And Niansheng Cheng	PoS 1.5	Online Room 1	Aug. 24	9:00	9:15
Research on AI-Driven Hierarchical Teaching Mode: A Case Study of Database Principles Course	Wei Yan	PoS 1.6	Online Room 1	Aug. 24	9:15	9:30
An Innovative Models for AI-Oriented Information Security Practical Capabilities Development	Pengcheng Liu, Yongwei Wang, Xiaohu Liu And Hao Hu	PoS 1.7	Online Room 1	Aug. 24	9:30	9:45
Research on the Growth Path of Network Practical Capacity Based on Tridimensional Pedagogical Model	Yongwei Wang, Yuchen Zhang, Pengcheng Liu And Mei Wang	PoS 1.8	Online Room 1	Aug. 24	9:45	10:00
Data-Driven I^3 Framework: Modeling and Visualization for Applied Higher Education	Yundi Guo, Xianghua Fu And Yongsheng Liang	PoS 1.9	Online Room 1	Aug. 24	10:00	10:15
Online Poster Session 2		**Sunday**	**Aug. 24**	**10:15-12:00**	**Online Room 1**	
Title	**Authors**	**Session**	**Room**	**Date**	**Start**	**End**
Construction and optimization path of digital literacy index system for securities practitioners	Yifeng Yan And Ning Wang	PoS 2.1	Online Room 2	Aug. 24	10:15	10:30
Logical Construction and Practical Design of the BOPPPS Teaching Model Based on the "Four Principles and Three Methods" Concept: A Case Study of "Java Framework Technology"	Xianmei Hua And Xinrong Zhan	PoS 2.2	Online Room 2	Aug. 24	10:30	10:45
Robust object detection via source-free domain adaptation in SAR data	Yue Huang And Qingfeng Cai	PoS 2.3	Online Room 2	Aug. 24	10:45	11:00
Experimental Platform for Structural Health Monitoring in IoT Engineering	Jin Qian, Chengfei Cai, Yan Xu, Hui Li, Xiaoshuang Xing And Shuai Liu	PoS 2.4	Online Room 2	Aug. 24	11:00	11:15
3D-MLV: Single Stage 3D Visual Grounding Using Multi-scale Local Voting	Qi A, Sanyuan Zhao And Ken Yang	PoS 2.5	Online Room 2	Aug. 24	11:15	11:30
Design of Series Experiments on Autonomous Driving for Teenagers	Zhuo Chen	PoS 2.6	Online Room 2	Aug. 24	11:30	11:45
The Implementation of Teaching Supervision Work in a Secondary College—Takingthe School of Computer and Information Science of Anhui Polytechnic University as an Example	Ping Zhang, Liu Tao, Jiashu Dai And Lili Fan	PoS 2.7	Online Room 2	Aug. 24	11:45	12:00
Practice Teaching Reform of Software Engineering Specialty under the background of "AI+New Engineering"	Yunhua Wang And Shuguang Tao	PoS 2.8	Online Room 2	Aug. 24	12:00	12:15
Design of Secure Beamforming for the IRS-assisted System of Simultaneous Wireless Information and Power Transfer under Hardware Impairments	Taotao Li, Yanggeng Dong And Zhihui Ge	PoS 2.9	Online Room 2	Aug. 24	12:15	12:30
TrustPHR：Trustworthy Management and Shared Utilization of PHR Based on Blockchain	Fei Zhao, Yuhan Wang And Tianyi Zang	PoS 2.10	Online Room 2	Aug. 24	12:30	12:45

Book of Abstracts

Special Workshop 1	The Expanding Role of Imaging: Understanding Aging, Supporting Diagnosis, Guiding Therapy		Saturday Aug. 23		9:30-10:30	3F- SCR	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
CT-image guided proton radiotherapy and related research aiming for adaptive treatment	Yoshikazu Maeda, Yoshitaka Sato, Kenji Kobashi, Masazumi Katayama, Hiroki Takada, Keiichiro Matsushita, Makoto Sasaki, Hiroyasu Tamamura And Kazutaka Yamamoto	Proton radiotherapy can produce conformal dose distributions to target tumors with sparing unnecessary dose to healthy organs. To utilize this physical selectivity efficiently, an image-guidance plays an essential role to places the tumor position precisely and detects the change of patients during daily treatment. Some proton therapy system vendors have started providing 3D volumetric image guidance as a standard function with the imaging equipment, such as in-room computed tomography (CT). At Fukui prefectural hospital proton therapy center, we installed a CT scanner in the treatment room and have performed CT image guidance as clinical practice since 2014. In this talk, first we will discuss the importance of not only CT-based registration but also daily dose monitoring of targets and surrounding organs for a more reliable and safer proton adaptive treatment. Second the study of AI-based recognize supporting technologies for CT-image guidance proton therapy will be presented.	SpW 1.1	3F-SCR	Aug. 23	9:30	9:50
Nuclear Medicine and Deep Learning: Utilizing AI for Patient-Friendly Imaging	Akinobu Kita	Nuclear medicine imaging visualizes the "function" of organs or lesions by administering radioactive tracers into the body. Unlike CT and MRI, which depict anatomical structures, nuclear medicine displays functional information such as bone metabolism, cerebral blood flow, and myocardial oxy-gen supply. It is widely used for diagnosing conditions like cancer metastasis, dementia, and ischemic heart disease. Although the adoption of deep learning in nuclear medicine lags behind CT and MRI, recent applications of deep learning in nuclear medicine imaging have gained attention. This presentation will introduce diagnostic support software and other tools that are advancing toward practical use. Additionally, I will introduce two of my previous research projects: 1) Estimating the specific binding ratio (SBR) from a single image of a 123I-FP-CIT SPECT scan, and 2) Enhancing low-dose bone scintigraphy image restoration using GAN. We look forward to seeing you there.	SpW 1.2	3F-SCR	Aug. 23	9:50	10:10
Visualizing Visual Function and Aging Using fMRI	Akihiro Sugiura, Yuta Umeda, Saki Hayakawa, Yuna Takagi, Masahiro Suzuki, Masami Niwa, Kunihiko Tanaka And Hiroki Takada	This study investigated age-related differences in cortical activation during central and peripheral visual processing using functional magnetic resonance imaging (fMRI). Thirty-four participants (16 young adults and 18 older adults) viewed dynamic visual stimuli designed to engage either foveal or peripheral vision. In young adults, peripheral viewing elicited focused and lateralized activation in early visual areas, whereas older adults exhibited broader, more bilateral engagement, particularly in occipital and dorsal parietal cortices. This pattern aligns with the HAROLD model and may reflect compensatory recruitment. No significant group differences were found during central vision tasks, suggesting relative preservation of foveal processing with age. Between-group analysis revealed enhanced dorsal pathway activation in older adults during peripheral viewing, support-ing the notion of adaptive neural reorganization. These findings underscore the need to distinguish between central and peripheral vision in aging re-search and suggest that interventions targeting peripheral visual function may be beneficial in supporting visuocognitive performance in older populations.	SpW 1.3	3F-SCR	Aug. 23	10:10	10:30

Special Workshop 2	Quantitative and Neurocognitive Analyses in Language, Behavior, and Brain Function		Friday	Aug. 22	14:30-16:00	2F-3rd MTG Room	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Quantitative Analysis of Dialogue Dynamics: Tracking Emotional Shifts in Green Book Through Morphological Parsing	Sana Domae, Kakeru Amano, Akira Hasegawa And Yasuyuki Matsuura	This study uses morphological analysis and quantitative methods to examine how racial slurs and expressions related to friendship evolve over time in the protagonist's dialogue from the film Green Book. The dialogue was divided into six chronological and six word-count segments, and frequencies were measured for 11 racial slurs (e.g., "colored," "Negro") and five friendship terms (e.g., "brother," "friend"). Morphological analysis classified lexical units, and co-occurrence networks visualized word relationships. The results showed that racial slurs were concentrated in the early segments across all divisions, while friendship terms in-creased in the later segments. Finer segmentation (three or more divisions) captured vocabulary shifts corresponding to narrative turning points. These results demonstrate that quantitative methods, such as morphological analysis, can reveal detailed linguistic patterns tied to character development.	SpW 2.1	2F-3rd MTG Room	Aug. 22	14:30	14:50
High-speed Reading Aloud as a Pedagogical Strategy for Enhancing Cognitive and Expressive Language Skills in Non-Kanji Background Learners	Kenichiro Kutsuna, Kunaj Somchanakit, Yoko Honda And Hiroki Takada	This study explores the nonlinear relationship between text length and oral reading speed among Japanese language learners from non-kanji back-grounds. Over four years, 126 university students read texts ranging from 50 to 700 characters. Reading speed (characters per second) showed a distinctive non-monotonic pattern: it decreased up to approximately 300 characters, in-creased between 300 and 600 characters, and declined again beyond 600. These findings suggest that moderately long texts facilitate fluent reading by supporting contextual prediction and rhythm formation, whereas very short or overly long texts disrupt processing due to fragmentation or cognitive overload. A comparison between two reading formats—whole-text reading (Condition A) and paragraph-segmented reading (Condition B)—revealed that Condition A generally led to faster reading speeds in the 300–600 char-acter range, highlighting the importance of cohesive rhythm and uninter- rupted flow. Crucially, the nonlinear trend observed may reflect not only surface-level behavior but also deeper neurocognitive dynamics. Studies in cognitive neuroscience suggest that oral reading engages distributed brain regions and that reading rhythm and fluency are associated with synchro-nized brain activity. Therefore, this study proposes the need for future re-search using EEG to investigate real-time neural processing during oral read-ing. The findings have pedagogical implications for optimizing reading mate-rials and training methods. They also open new directions for evidence-based language education supported by neuroscience, particularly in identifying optimal reading conditions that enhance both performance and cognitive ef- ficiency.	SpW 2.2	2F-3rd MTG Room	Aug. 22	14:50	15:10
A Study on the Effect of Covert Attention on Microsaccade Direction	Fumiya Kinoshita	Since the 2000s, the interest in quantifying covert attention using microsaccade data has considerably increased, with microsaccades attracting attention in various research fields. However, many aspects of microsaccade measurement remain unclear, and no standard analysis has been established. Although previous studies have reported that the direction and frequency of microsaccades are modulated by covert attention, consensus has not been reached. Thus, additional empirical studies on microsaccades must be conducted, and their evaluation should be performed using unified methods. Accordingly, we conducted an experiment with 20 young adults to investigate the influence of covert attention on microsaccade direction. For microsaccade detection, we employed an existing algorithm that identifies microsaccades during a 120 s fixation task. The direction of each detected microsaccade was calculated using the arctangent2 function from the two angular coordinates at the onset and offset of a microsaccade. Statistical analysis revealed no significant differences in the number of microsaccades by direction across the evaluated attention conditions. On the other hand, as microsaccades are typically regarded as binocularly coordinated eye movements, we initially assumed that their directions are consistent in both eyes. However, in our experiment, we observed microsaccades with inconsistent directions between the left and right eyes.	SpW 2.3	2F-3rd MTG Room	Aug. 22	15:10	15:30

Invited Session 1	Building Science Popularization Educational Resources in the Age of AI		Friday	Aug. 22	14:30-16:00	3F-SCR	
Chair:	**ZHOU Wei**						
Co-Chair:	**CHEN Yulin, QIANG Yan**						
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**

Changes in tourism topics in Southeast Asia: A Machine Learning-Based Analysis of Tourism UGC	Yulin Chen, Yanting Tong, Binyue Cui And Wei Zhou	While tourism is booming across Southeast Asia (SEA), the spread of COVID-19 is having a clear impact on touristy cities. This study aims to analyze the changes in the public's information needs before and during the pandemic in different types of tourist cities through topic modeling. Using the city infor-mation provided by the community UGC to obtain a large amount of unstruc-tured data, the topic is further divided into the clue characteristics of function-al value and symbolic value so that the difference in community attention be-tween the tourism cities with severe outbreaks and those under control in SEA can be understood. The results show that the pre-pandemic city information mostly provided unilateral store or community information, which did not meet the functional value nor the needs of the public because the distinctive urban value is lacking, it was impossible to attract the public to actively partic-ipate.	InS 1.1	3F-SCR	Aug. 22	14:30	14:45
Design and Practice of Railway Track Visual Detection Science Popularization Teaching AIDS for Youngsters	Wenjuan Peng	To address the technological lag and insufficient interactivity of existing science education tools, this study develops a simple, lightweight, and modular track detection teaching aid. The system achieves intuitive visualization and multi-dimensional interaction for railway track detection while maintaining low cost. The research includes: (1) Design of a detection vehicle model and track model, integrated with a power unit to form the electromechanical structure; (2) Implementation of a recognition algorithm based on the Maix-I development board, where a streamlined program for visual track detection was developed. The fine-tuned MobileNet_0.75 model was trained, tested, and deployed locally via the nncase platform, demonstrating extensibility in both hardware and software. The teaching aid has been validated in multiple outreach activities and received widespread praise from educators.	InS 1.2	3F-SCR	Aug. 22	14:45	15:00
Application Virtualization Based Network Simulation Experiment Platform	Zhifei Zhang, Shize Tang, Wei Zhou And Ke Xiong	Through virtualization technology, the hardware resources of the server are shared, so as to support a large number of users to access at any time and place at the same time, which greatly reduces the cost of hardware and maintenance. The paper designs a network simulation platform base archi-tecture based on application virtualization technology. The simulation plat-form base is compatible with a variety of network simulation software, re-duces the resource occupation of the server through application virtualiza-tion, and improves the remote access method, providing a unified service access interface, and supporting browser and "soft application" access methods. In addition, the security and stability of the service are guaranteed through virtualization security assurance and application layer load balanc-ing technology. The simulation platform deeply integrates remote network simulation experiments and teaching arrangements, and builds an experi-mental platform through microservices, load balancing algorithms, Web-Socket protocols and other related technologies. It supports real-time inter-action between teachers and students and user authority control; it pro-vides experimental navigation, content management, homework manage-ment and other functions; in addition, it designs and implements platform support modules and monitoring modules, which integrate core functions such as virtual machine management, automated deployment, and platform monitoring, to achieve one-stop quick construction of the platform envi-ronment, laying a solid foundation for subsequent deployment and mainte-nance work.	InS 1.3	3F-SCR	Aug. 22	15:00	15:15
A Unified Digital Twin Platform for the Experiment Education of "The 101 Plans" Hardware Courses	Yu Huang, Zonghui Li, Ke Xiong And Ziyao Shen	This paper presents a Digital Twin-based teaching platform that supports the main hardware courses for undergraduate education. It is part of "The 101 Plans" initiative, which aims to unify and improve computer hardware experimental courses. We develop a Digital Twin platform and a series of RISC-V-based courses on computer organization and system architecture. The platform supports hybrid teaching with physical experiment board and a Digital Twin client when the physical boards are not in hands. This setup overcomes equipment constraints, allowing for centralized hardware management and improved maintenance and efficiency. The platform can support hardware courses from digital circuits to CPU design and CPU performance optimization and finally covers System-on-Chip (SoC) development and operation system booting. We have written a series of detailed experimental guides for these courses. It combines clear instructional guidance with carefully designed problems. Some engineering challenges are intentionally required to encourage independent problem-solving and deeper hands-on engagement. The platform has been granted three patents and serves as the official competition platform for the RISC-V Cup track of the 2025 China College IC Competition. A pilot run of the Computer Organization course at Beijing Jiaotong University this year received positive student feedback and demonstrated effective learning outcomes.	InS 1.4	3F-SCR	Aug. 22	15:15	15:30
Research on Key Algorithms for Text Auto-Correction Based on DeepSeek	Yuejuan Wei, Bin Zhang, Qing Li And Yan Qiang	Text auto-correction is a crucial research direction in the field of Natural Language Processing (NLP), widely applied in intelligent writing, search engine optimization, educational assessment, and other domains. Traditional correction methods relying on rules and statistical models struggle to address complex semantic errors. In recent years, pre-trained language models based on deep learning (such as BERT and GPT) have significantly improved correction performance, yet challenges remain including high computational complexity and suboptimal performance on long texts. This paper proposes a DeepSeek architecture-based text auto-correction method, integrating Dynamic Masked Language Modeling (DMLM) and adversarial training strategies to enhance the model's semantic understanding capability and robustness. Experimental results demonstrate that on NLPCC2018 and SIGHAN datasets, our method achieves a correction accuracy of 93.5% and an F1-score of 92.1%, outperforming existing mainstream models (e.g., BERT, T5). This research provides a novel technical solution for efficient and high-precision text correction.	InS 1.5	3F-SCR	Aug. 22	15:30	15:45

Invited Session 2	**AI-enabled Computer Practice Teaching**		**Saturday**	**Aug. 23**	**8:00-10:00**	**Online Room 1**	
Chair:	**Dapeng Qu**						
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Large Language Model Helps the Teaching Reform of Programming	Zhan Tang, Xiaoli Peng, Xiaoyu Lu And Nian Yang	In view of the problems existing in the current teaching of programming course, such as outdated teaching content, single teaching method, weak practice link, and weak innovation ability, this paper analyzes the application status of artificial in-telligence and large language model in the field of education, and puts forward a teaching reform strategy based on AI model, which includes updating auxiliary teaching resources, enriching teaching mode, optimizing practice link, and im-proving auxiliary innovation ability. This paper shows the application effect of AI model in practical teaching through case analysis, and discusses the challenges and coping strategies of introducing AI model in teaching, aiming to provide ref-erence for the teaching reform of programming.	InS 2.1	Online Room 1	Aug. 23	8:00	8:15

GPE-DKT: An Enhanced Deep Knowledge Tracing Model Integrating Generalized Training and Personalized Fine-Tuning for Learning Assessment	Xin Dong, Qing Zhang And Dapeng Qu	Knowledge tracing (KT) is a method used to evaluate learners' learning states in personalized learning environments. However, traditional KT faces several challenges, including the cold-start problem, inadequate modeling of individual differences, and noise in real-world learning data. To address these issues, we propose a generalized and personalized enhanced deep knowledge tracing (GPE-DKT) model. First, we extracted key behavioral features from student interaction data using decision tree analysis and Pearson correlation. We then combined these features, which include both static and dynamic features, and fed them into the model. Furthermore, we compressed the input and label spaces via dimensionality reduction to improve behavior pattern identification. To reduce data noise, we established an anomaly rate threshold and introduced a “Mini-Test Model” to identify untrustworthy records. The training process was innovatively decomposed into two sequential stages: generalized modeling to mitigate missing knowledge points in learning records, and personalized modeling to capture learner-specific behavioral patterns. Experiments on real-world learning data demonstrate the effectiveness of GPE-DKT in evaluating learning states and forecasting student performance, especially in data-limited scenarios, showcasing higher stability and accuracy. We further validate the proposed model through a system deployed for learning evaluation.	InS 2.2	Online Room 1	Aug. 23	8:15	8:30
Research on the Practice of a Three-Dimensional Teaching Innovation System Empowered by AI in the Java Programming Course	Ze Yang, Xuejuan Chen And Yali Shao	Against the backdrop of new engineering education construction, theteaching of the “Java Programming” course faces multiple challenges, includingthe disconnection between learning and application, the monotony of evaluation methods, and the obvious differences in students' ability levels. This studyconducts an in-depth analysis of the problems existing in the traditional linearteaching model in terms of knowledge transmission, ability cultivation, andtechnological application. Based on constructivist learning theory andintelligent education paradigms, this research proposes an AI-empoweredteaching innovation system named "Project Chain - Hierarchical Learning - Intelligent Assessment" to address the above challenges. Rooted in the "One Core, Seven Wings" teaching model, this innovative system aims to achieve thecollaborative development of knowledge imparting, ability cultivation, andideological and political education by comprehensively enhancing teachingquality. Guided by the "Six Dimensions, Three Realms" framework, theclassroom reform plan meticulously designs the curriculum structure — fromteaching objectives to specific content — to achieve the goals of knowledgetransmission, ability cultivation, and value shaping for students. Meanwhile, byreconstructing the three-level capability stages of "Basic Grammar - LogicalModeling - System Implementation" and integrating real industrial cases withcurriculum ideology and politics elements, the system enables personalizedlearning path planning, stratified teaching, and precise teaching intervention. The establishment of a multi-dimensional dynamic evaluation systemcomprehensively assesses students' knowledge, abilities, and qualities. Practical results demonstrate that this innovation system has significantly improvedstudents' code debugging efficiency and project documentation standardization while enhancing the course's high-quality performance rate, providing a valuable exploration of intelligent pathways for curriculum reform inprogramming courses within the new engineering education framework.	InS 2.3	Online Room 1	Aug. 23	8:30	8:45
Collaborative Construction of Computational Thinking and Digital Thinking Empowered by Programming Agents from the Perspective of "Integrating Morality and Skills" — A Case Study of Judicial Police Colleges	Zongmei Liu And Jianxin Tan	In the context of vocational education reform featuring "integration of morality and skills, and combination of work and study", programming courses in judicial police colleges are facing dual challenges of integrating technical capability cultivation with legal professional literacy. Aiming at the current problem of "emphasizing skills over ethics" in programming education, this study constructs a three-dimensional cultivation model of "ideological and political guidance-technical capability foundation-professional ethics development", and develops scenario-based programming agents with functions such as code logic verification and professional ethics guidance. By deeply exploring the collaborative construction path of computational thinking and digital thinking in judicial professional scenarios, it systematically explores the integration mechanism of technical training and moral education infiltration. The research shows that the agent significantly improves students' problem decomposition ability and data security awareness, providing a reproducible and promotable innovative paradigm for the high-quality cultivation of judicial professionals in the era of "digital rule of law".	InS 2.4	Online Room 1	Aug. 23	8:45	9:00
Knowledge Graph-Driven Education Framework: A Case Study of Introduction to Computer Science Course	Chenlu Zhuansun, Yuan Liu, Qiang He, Qinglin Yang, Pengdeng Li, Gongxuan Zhang And Zhihong Tian	In the era of big data and Artificial Intelligence (AI), the integration of knowledge graph into computer science education has emerged as an important challenge, particularly in effectively leveraging structured information to enhance learning outcomes. To takle the challenge, we propose a Knowledge Graph-Driven Learning (KGDL) framework aimed at enhancing computer science education by utilizing knowledge graph for structured learning. The framework integrates dynamic curriculum knowledge graph, graph neural network-based navigation for personalized learning path, and an intelligent tutoring module that provides adaptive feedback aligned with cognitive principles. The effectiveness of the KGDL framework is validated through case studies involving students in an Introduction to Computer Science course, demonstrating its potential to foster adaptive learning and improve student engagement.	InS 2.5	Online Room 1	Aug. 23	9:00	9:15

Invited Session 3 **Innovation and Practice in AI Education and Teaching** **Friday** **Aug. 22** **16:30-18:30** **2F-3rd MTG Room**

Chair: **LUO Juan**

Co-Chair: **ZHAO Huan, CAI Yuhui**

Title	Authors	Abstract	Session	Room	Date	Start	End
Integration of Computational Thinking and Artificial Intelligence in General Education: A Case Study of "Introduction to Computing and Artificial Intelligence" at Hunan University	Yuhui Cai And Juan Luo	This paper investigates the integration of computational thinking and artificial intelligence (AI) into general education, proposing a framework for cultivating AI-era talents. It analyzes the interdependence between AI literacy and computational thinking, advocating a pedagogical approach that extends AI education through computational thinking foundations. The study details Hunan University's "Introduction to Computing and Artificial Intelligence" course, which implements a tripartite teaching system focusing on knowledge construction, thinking cultivation, and ability development. This model effectively promotes synchronous growth in students' computational thinking and AI competencies. The course employs a four-dimensional operational framework combining objective guidance, interdisciplinary content, innovative methodologies, and comprehensive evaluation. Results show enhanced problem-solving abilities through computational methods, improved AI technology application skills, and strengthened innovative capacities. This practice provides a replicable paradigm for integrating computational thinking and AI education, offering practical insights for global higher education institutions. The research contributes to both theoretical understanding of computational thinking-AI synergies and pedagogical innovation in talent cultivation. Future work will optimize teaching content, explore advanced instructional methods, and expand real-world application scenarios to meet evolving societal demands. This study underscores the importance of integrating computational thinking into AI general education for developing future-ready talents.	InS 3.1	2F-3rd MTG Room	Aug. 22	16:30	16:45
Automatic Coding Application and Practical Research on Classroom Dialogue	Tengda Qi, Jun He, Bo Sun, Wang Ruan And Guomin Zheng	By constructing a three-dimensional, multi-agent coding indicator system that integrates both the content and form of classroom dialogue, and incorporating large language model (LLM) technology, high-accuracy automated coding of classroom dialogue content can be achieved. Real-time automatic coding of classroom dialogue enables AI-powered effective diagnosis and precise feedback on classroom teaching. Large-scale automatic coding of classroom dialogues can reveal patterns in effective teaching, effective learning, and cognitive development. Longitudinal automatic coding of classroom dialogues facilitates empirical research on teacher professional development and the evolution of students' learning abilities.	InS 3.3	2F-3rd MTG Room	Aug. 22	16:45	17:00

Exploration and Practice of Aesthetic Education in College Computer Courses from the Perspective of AI	Yu Niefang, Li Xiaomei And Peng Xiaoning	In the new era where artificial intelligence profoundly empowers educational transformation, the traditional "technology-first" teaching paradigm in university computer science curricula can no longer meet the contemporary demand to "cultivate well-rounded socialist builders and successors excelling in moral, intellectual, physical, aesthetic, and labor education" .Guided by the Opinions on Comprehensively Strengthening and Improving Aesthetic Education in Schools in the New Era, this study systematically examines the theoretical foundations and practical challenges of integrating aesthetic education into computer science curricula. By establishing a trinity teaching framework encompassing technical cognition, aesthetic experience, and value guidance—supported by AI empowerment , interdisciplinary integration , faculty development , and a multidimensional evaluation mechanism— we explore innovative pathways for deep convergence between technological education and aesthetic education.Through restructured content , pedagogical innovation , AI-enabled applications , and assessment reform , the research significantly enhances students' computational thinking and aesthetic literacy. The integration of AI not only optimizes aesthetic education efficiency but also stimulates students' creative potential through intelligent feedback and immersive experiences. Meanwhile, interdisciplinary collaboration and value guidance facilitate students' transition from technical executors to digital civilization architects .	InS 3.4	2F-3rd MTG Room	Aug. 22	17:00	17:15

Invited Session 4	**Cultivating Computational and Mathematical Thinking through Solving Problems by Programming**		**Saturday**	**Aug. 23**	**8:00-10:00**	**Online Room 2**	
Chair:	**WU Yonghui**						
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Exploring an Intelligent and Innovative Programming Teaching Model Based on Agent Programming Paradigm	Xin Xie, Yuantao Chen, Lixia Luo And Yonghui Cui	This paper addresses key limitations in traditional programming education, particularly the lack of support for student autonomy and innovation. We propose an intelligent and innovative programming teaching model based on the agent-oriented paradigm. The model integrates instructional content, evaluation, and feedback mechanisms around three core components: self-directed learning, intelligent tutoring, and practical innovation. It is implemented through a collaborative "student–agent–teacher" framework. Empirical evidence from case studies demonstrates the model's effectiveness in enhancing students' autonomy, programming proficiency, and innovative capacity. The approach provides a promising pathway for the intelligent transformation of programming education in application-oriented undergraduate contexts.	InS 4.1	Online Room 2	Aug. 23	8:00	8:15
Computational Thinking Curriculum Design: A Triadic Integration of Listening, Teaching, and Practicing	Juan Zhou, Yonghui Wu, Zhiwei Zhang, Hui Luo, Xiong Li And Nan Xiao	This paper introduces the new course "Computational Thinking and Programming" created by the author, proposing a three-dimensional course construction model of "enjoy listening, excel at teaching, and master practicing." Through strengthening classroom management, assigning problem-solving exercises, and designing multi-level experimental tasks, the course aims to cultivate students' computational thinking and innovation abilities. Taking the " Touge Practical Teaching Platform" as an example, the paper explains how this platform supports computer education in universities by providing practical teaching cases and courses, thereby facilitating the development of computer science and engineering disciplines. Additionally, the paper discusses the selection and utilization of teaching materials and presents the outcomes of course implementation. Finally, the article explores the role of extended programming competition training in cultivating scientific and technological talents.	InS 4.2	Online Room 2	Aug. 23	8:15	8:30
Interesting Teaching of Algorithm Courses Supported by Syllabus, Textbooks and Cases	Xiong Li, Kun Rao, Hui Song And Juan Zhou	This paper writes interesting teaching into the course outline and optimizes the interesting teaching cases of specific courses. Taking the traveling salesman problem, Kruskal algorithm, and the personalized recommendation algorithm that breaks the information cocoon as examples, this paper explains the analysis and presentation of interesting teaching, designs teaching details, and improves the quality of the course. It also introduces the writing of interesting algorithm design teaching materials to stimulate students' enthusiasm for designing more advanced algorithms, in order to provide a reference for the teaching of related courses.	InS 4.3	Online Room 2	Aug. 23	8:30	8:45

Special Session	**Best Paper Candidates**		**Friday**	**Aug. 22**	**16:30-18:30**	**3F-SCR**	
Chair:	**CUI Binyue**						
Co-Chair:	**WENG Yang**						
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Construction and Practice of a Distinctive Science Popularization and Education Base for Artificial Intelligence and Future Transportation Technology—Taking Beijing Jiaotong University as an Example	Shouqiang Zhao, Ke Xiong, Wei Zhou And Wenjuan Peng	In the era of deep integration between artificial intelligence and transportation technology, the establishment of specialized science popularization education bases has become a crucial pathway for enhancing public scientific literacy, promoting the spirit of science, and cultivating innovative thinking and capabilities. Beijing Jiaotong University Artificial Intelligence and Future Transportation Technology Science Popularization Education Base targets the cutting-edge technologies in the fields of artificial intelligence and intelligent transportation. It focuses on three key modules: facility and equipment construction, science popularization education courses development, and the establishment of science popularization volunteer teams and management systems, to build a distinctive and specialized science popularization education base. The successful implementation of science popularization activities such as “Science and Technology Activity Week” demonstrates the significant achievements of science popularization education bases in enhancing public awareness, cultivating talent, and fostering social collaboration. These initiatives have fostered a conducive learning atmosphere and academic environment, providing a replicable model for the development of distinctive science popularization platforms at higher education institutions.	SpS 1.1	3F-SCR	Aug. 22	16:30	16:45
A Human-AI Collaborative Strategy for Project-Based Learning Using Large Language Models	Yuan Fang, Weizhen Wang, Shikai Guo, Mingjian Liu And Xiang Li	The rapid advancement of Large Language Models (LLMs) has introduced novel opportunities for enhancing project-based learn- ing (PBL), particularly in beginner-level Python courses for students from non-computer science backgrounds. These models offer a bridge between natural language and programming logic, allowing learners to concentrate on authentic problem-solving rather than syntactic complex-ities. However, most current applications of LLMs in education provide fragmented, short-term support and lack coherence across the full lifecy- cle of project development. To address these challenges, this study pro- poses a Human-AI Collaborative Strategy based on the Problem-Driven Cognition and Outcome-Based Education (PDC-OBE) framework. This strategy emphasizes structured learning progression, alignment with in- structional objectives, and cognitive engagement. A case study involving a sentiment analysis project was conducted to evaluate the implemen- tation of this model. The integration of LLMs across preparation, ex-ecution, reflection, and assessment phases demonstrated significant im- provements in student engagement, computational thinking, and reflec- tive learning. The proposed framework offers a scalable, pedagogically grounded approach for integrating AI into programming education and serves as a foundational model for future development of domain-specific educational agents.	SpS 1.2	3F-SCR	Aug. 22	16:45	17:00

An Agent-Driven Programming Learning Support System Based on Proactive Insight Agent	Haojie Shi, Haoran Yang, Wenyi Xie, Ruobin Wang And Fengxia Li	Programming learning is of paramount importance for students in computer-related disciplines. However, conventional learning approaches often suffer from ineffciencies and delayed feedback. This paper designs and implements an intelligent programming learning supportsystem based on a Proactive Insight Agent (PIA). Beyond providing fundamental features such as online code editing, execution, and testing, thesystem's core innovation lies in introducing a PIA-driven cognitive errorcorrection mechanism and proactive dialogue intervention. The PIA canperceive learners' behavioral patterns in real-time, analyze their learningstates, and, upon detecting potential learning impasses, proactively initiate context-aware dialogues by deeply integrating with Large LanguageModels (LLMs).These dialogues guide learners through cognitive refection and error rectifcation. This paper elaborates on the system's designphilosophy, architecture, and the implementation of its core functionalities. Furthermore, it demonstrates the system's potential in assistinglearners to overcome programming obstacles and enhance learning efficiency through illustrative examples.	SpS 1.3	3F-SCR	Aug. 22	17:00	17:15
Application of Image Recognition Technology Helping to Understand Quantum Chaos in the Semiclassical Regime	Hiromu Ishio	A planar stadium billiard is one of the prototypical dynamic mod-els which is to manifest classical chaos in quantum mechanics and often used for research in the field of quantum chaos. We apply computational image recognition technology to quantum transport through an open stadium billiard. We find that the technology can help to intuitively understand quan-tum manifestation of classically chaotic nature such as an ergodic property developed as quantum wave localization of the system in the semiclassical regime.	SpS 1.4	3F-SCR	Aug. 22	17:15	17:30
Comparative Analysis of Translator Styles in Lu Xun's Works using Text Mining	Kokoro Chaya, Kakeru Amano, Akira Hasegawa And Yasuyuki Matsuura	This study empirically demonstrates the influence of translators' styles on the interpretation of literary works. Through a comparative analysis of multiple Japanese translations of Lu Xun's "Hometown" and "The True Story of Ah Q" using text mining, it shows how these styles affect interpretation. The translations of "Hometown" by Yoshimi Takeuchi, Kobai Inoue, and Haruo Sato, and the translations of "The True Story of Ah Q" by Takeuchi, Inoue, and Shinji Komada, were analyzed using keyword extraction and co-occurrence network analysis. The results revealed commonalities in the selection of basic nouns, but differences in frequency of word usage, notation, and tendencies by part of speech revealed distinctive expressive characteristics for each translator. The study also suggests that differences in translators' vocabulary, expressions and styles can affect how readers perceive the same work.	SpS 1.5	3F-SCR	Aug. 22	17:30	17:45
High-Frequency EEG Biomarkers of Cognitive Function Revealed by Wavelet Analysis	Kakeru Amano, Yasuyuki Matsuura, Kuwon Sumi, Akihiro Sugiura, Hirofumi Tahara And Hiroki Takada	In Japan, rapid population ageing and declining birth rates are intensifying the dementia-care load on younger generations. Early detection of mild cognitive impairment (MCI), the prodromal phase of dementia, is challenging because functional loss is subtle and conventional imaging or clinical EEG are costly and burdensome for screening. This study aimed to extract MCI-related features from high-frequency EEG recorded with a low-cost, two-sensor head-band device. EEG was collected from healthy younger and older adults while they performed dementia-related tasks, and spectral power across 1–130 Hz was quantified using continuous wavelet transforms. Older adults exhibited significantly greater power than younger adults in every band for all tasks. Notably, high-γ activity (70–130 Hz) was markedly elevated and its post-task suppression was prolonged in the elderly, providing clear age-group separation. These findings suggest that head-band EEG combined with high-frequency wavelet analysis offers a rapid, non-invasive biomarker for early cognitive decline.	SpS 1.6	3F-SCR	Aug. 22	17:45	18:00
Toward System- and Theory-Oriented Talent Cultivation in Computing	Yu Zhang	Driven by rapid advances in computing technologies and increasing interdisciplinary demands, there is a growing need for flexible and forward-looking models of computing talent cultivation. This paper presents an ongoing exploration within the Huaxia Computer Science and Technology Talent Program at USTC, which has focused on system–oriented training for more than a decade. Since 2022, the program has been developing a dual pathway model that incorporates both system-oriented and theory-oriented approaches to better address evolving academic and industry needs. Putting emphasis on research-driven learning, open source practice, and academic competitions, the program encourages interdisciplinary thinking and early-stage innovation. The theory-oriented path is currently under active development to address curricular gaps in algorithms and computational theory. This work reflects efforts to build a flexible student-centered model under the "System / Theory + X" paradigm.	SpS 1.7	3F-SCR	Aug. 22	18:00	18:15
Cultivating Computational and Mathematical Thinking by Solving Programming Contest Problems	Yonghui Wu And Juan Zhou	Now all professions and works reliant on tool-based skills, including programmers, are being replaced by AI technologies. Cultivating students' computational and mathematical thinking by solving programming contest problems can be as a breakthrough point for the reform of computer education in the AI era. It is implemented by constructions of teaching materials, curricula and a cross-institutional and cross-regional programming training system. And innovations and effects are introduced.	SpS 1.8	3F-SCR	Aug. 22	18:15	18:30

Parallel Discussion 1	**Computer science and Data science**	**Saturday**	**Aug. 23**	**9:30-10:30**	**2F-3rd MTG Room**	
Chair:	**SHENG Yu**					
Co-Chair:	**Katsuyuki Umezawa**					

Title	Authors	Abstract	Session	Room	Date	Start	End
Development of a Web-based Software Application for the Longevity Extension Research	Sena Seneviratne, Udaya Seneviratne Seneviratne, Yashas Mallawarachchi And Aditya Abeysinghe	One of the primary concerns in the life extension industry is the absence of scientifically validated interventions that reliably extend the human lifespan. The market is saturated with products marketed for anti-aging benefits, yet most lack clinical approval and scientific backing. The U.S. Food and Drug Administration (FDA) has only approved one life extension-related clinical trial—the TAME (Targeting Aging with Metformin) study—but there is no officially recognized life extension drug yet. As a result, consumers often rely on over-the-counter supplements, cosmetics, and alternative medicine with uncertain efficacy. This study addresses the gap in the collaboration between scientists (stakeholders) and their communication with patients and commercialization of their research findings. Our primary objective is to develop an online platform namely BlitzAge.com which will cater to the requirements of the scientists. A preliminary survey was conducted to find out details of the research problem using 60 stakeholders (medical doctors/ scientists/ institutions) who are currently involved in researching in lifespan extension. Through semi-structured face-to-face interviews, it has been revealed that a considerable number of researchers are having the potential to attract funds for their research even under current world economic conditions. In addition to that, most researchers are willing to spend about half of their research funds on acquisition, holding, maintenance, analysis and presentation of research data. Furthermore, they intend to earn money through various other means such as advertising, allowing interested parties access to data archives etc. Researchers prefer their data analyzing tools to be integrated with the proposed online platform so that they can be used efficiently. The other main concern is about wanting strict security for their archived data. The subscription-based charging model has been preferred. However, a pay-user model is preferred when hiring cloud services for analyzing large amount of data. After carefully analyzing the surveyed results, it was concluded that in the current world context, an online platform can be developed to provide the much-needed solution to stakeholders.	PaD 1.1	2F-3rd MTG Room	Aug. 23	9:30	9:45

A Scientific Training Procedure for Attaining Fluency in Stress time language using Computer Assisted Language Learning	Sena Seneviratne, Judith Beveridge, Aditya Abeysinghe And Liyanage De Silva	In this paper we discuss about a study which is conducted to design a Computer Assisted Language Learning computer software system (CALL) which helps self-educate the spoken English learners. This software system detects English language syllable stress and uses the results to guide the prospective learners towards a successful learning of spoken English. The difficulties of a spoken language student become more when an adult student whose vernacular tongue belongs to a syllable-time language such as Japanese or Mandarin, is making an effort to learn a stress-time spoken language such as English. In a stress-time language, it is the utterances with correct word stress and thereby sentence stress which is usually a problem among adult learners. Using the right sentence stress is the key point in a proper communication. For a learner whose vernacular tongue is syllable-time, making mistakes on this area is very common. By carefully studying the accurately pronounced sentences of general conversations, we have found that their sentence rhythm is similar to that of the blank verse. However, when and where necessary the alliteration (and assonance) is used in the general conversations. In this paper, we have modeled the phrases of general English conversations using rhyming couplets and triplets which are solely written in iambic pentameter. The alliteration have been used when and where it is suitable to do so. These modeled phrases of conversations have been tested with a group of 50 senior school students who are already having pronunciation difficulties in speaking the English language. After 3 months of daily training, the students considerably improved their language pronunciation skills. This proven algorithm will be used to build a novel CALL system.	PaD 1.2	2F-3rd MTG Room	Aug. 23	9:45	10:00
HAMFD: A Lane Line Detection Model with Hybrid Attention Based on Multi-Feature Regression at Different Scales	Siwei Wei, Can Zhou, Jinhang Liu, Wang Chunzhi And Lingyu Yan	The lane detection model based on a single feature layer is plagued by an imbalance in lane recognition and positioning, particularly when lanes are occluded or lighting conditions are poor. This significantly hampers the enhancement of environment understanding capabilities in driving assistance or autonomous driving systems. To address this challenge, a hybrid attention lane detection model based on multi-feature scale-by-scale regression, named HAMFD, is proposed. The model first employs a hybrid attention mechanism to capture lane features that encompass both global and local contextual information, thereby enhancing lane representation and improving adaptability to occluded lanes and poor lighting conditions. It then leverages scale information from different feature layers to regress lanes based on shape anchor information, progressing from larger to smaller scales to improve lane positioning accuracy. To enhance the quality and generalization ability of shape anchors, they are incorporated as trainable parameters for continuous updating and optimization during model training. The local tilt angle is also introduced into the IOU calculation to impose stricter shape constraints on lanes. Finally, a multi-task learning mechanism is adopted to adaptively learn the weights of each loss function, reducing the complexity of model parameter tuning. Tests demonstrate that the model can effectively detect lanes in complex real-world road scenarios. When equipped with a DLA34 backbone network, the model achieves an F1 score of 80.21% on the CULane dataset, with a detection rate of 128 fp/s, outperforming other lane detection models such as CondLaneNet, GANet, and Lane2Seq.	PaD 1.3	2F-3rd MTG Room	Aug. 23	10:00	10:15
Construction and Practice of Digital Literacy Teaching Quality Improvement Model with Double Helix Structure	Ning Wang, Mingming Chen And Liqing Guo	This paper explores the needs to enhance digital literacy and skills among university students in the digital age. It centers on the concept of quality control in process management and designs a Double Helix Structure model for improving the quality of digital literacy education. On the content side, it enriches and enhances the quality through selection, supervision, and evaluation. On the learning side, it encourages students to enhance their self-awareness, independent planning, and personalized learning by holding annual digital literacy competitions, thereby addressing personal shortcomings and achieving continuous improvement. The model has been piloted at multiple universities, yielding significant results in areas such as teaching awards, online courses, teaching materials, question banks, and certifications.	PaD 1.4	2F-3rd MTG Room	Aug. 23	10:15	10:30

Parallel Discussion 2 **New digital technology's application** **Saturday** **Aug. 23** **11:00-12:00** **2F-3rd MTG Room**

Chair: **SHENG Yu**

Co-Chair: **Katsuyuki Umezawa**

Title	Authors	Abstract	Session	Room	Date	Start	End
Visual Analytics of Student Behavior Patterns Based on Online Judge Log Data	Jiaxin Yu, Pengyang Zhu, Guihua Duan, Ping Zhong And Yu Sheng	As a crucial practical platform for programming education, Online Judge (OJ) systems directly reflect students' knowledge mastery and comprehension through their problem-solving performance. Existing evaluations primarily focus on pass/fail status and ranking statistics, while overlooking the learning insights embedded in behavioral data such as submission timing, attempt frequency, and keystroke behaviors. To address this gap, this paper designs OJVis, a visual analytics system for mining and analyzing learning behavior patterns. Comprising five coordinated views - Problem Transition Graph, State Shift Graph, Pattern Cluster Graph, Behavior Evolution Graph, and Code Difference Graph - OJVis enables instructors to comprehensively explore submission logs across multiple dimensions: problem-solving paths, outcome evolution, behavioral patterns, and individual trajectories. The system facilitates precise identification of at-risk students, in-depth analysis of behavioral causes, and data-driven support for personalized instruction. The case analysis based on the real data of the CSUOJ system of a certain school demonstrate OJVis' significant practical utility and effectiveness in uncovering learning behavior patterns and assisting pedagogical decision-making.	PaD 2.1	2F-3rd MTG Room	Aug. 23	11:00	11:15
Comparison of Nervousness Levels in Interpersonal and ChatGPT-based Learning for Cambodian Language Acquisition	Katsuyuki Umezawa, Toun Akyra, Makoto Nakazawa, Michiko Nakano And Shigeichi Hirasawa	In recent years, learning support tools that use generative artificial intelligence (AI) technologies have garnered significant attention as a means of providing personalized learning experiences. When learning a new language, psychological burdens such as the ``fear of making mistakes'' and ``anxiety in interpersonal communication'' have been identified as major obstacles to effective learning. This study evaluates differences in anxiety levels between interpersonal and generative AI-based learning by measuring brain activity using electroencephalography. The results indicate that interpersonal learning tends to induce higher levels of anxiety, particularly during the initial stages, even though this anxiety diminishes with repeated sessions. In contrast, ChatGPT-based learning tends to suppress anxiety, even in the early stages. These results suggest that ChatGPT is an effective tool for reducing anxiety in second language acquisition. In particular, the experimental results demonstrate that ChatGPT can serve as a means for learners who feel anxious about interpersonal learning to continue their studies in a more relaxed state.	PaD 2.2	2F-3rd MTG Room	Aug. 23	11:15	11:30
Design and Implementation of Bidirectional Intelligent Sign Language Recognition Gloves Based on Multi-Sensor Fusion and Artificial Intelligence	Guochen Zhang, Rui Wen, Qi Zhou, Gang Cen, Junyan Luo And Zhiqi Jin	In daily life, communication is an important basis for social interaction. However, people who are deaf or hard of hearing encounter many obstacles in communicating due to their hearing impairment, which seriously affects their social participation and quality of life. To solve this problem, this paper designs and implements a bidirectional intelligent sign language recognition glove based on multi-sensor fusion and artificial intelligence. The system uses Flex2.2 bending sensors and MPU6050 six-axis posture sensors to collect hand dynamic information, and then transmits this data via STM32 Bluetooth communication to the mobile phone side, which in turn realizes the voice output and recording of sign language translation. On the mobile phone side, this project utilizes the Long Short-Term Memory (LSTM) network to construct a sign language recognition model and introduces the Transformer architecture to realize the speech output function. The system supports the bidirectional conversion of sign language to speech and speech to text, thus facilitating barrier-free communication between hearing-impaired people and hearing people. The experimental results show that the system performs well in the accuracy of sign language recognition and voice interaction experience, enabling potential applications in the fields of barrier-free communication and assisted medical care.	PaD 2.3	2F-3rd MTG Room	Aug. 23	11:30	11:45

On the Design of AI Teaching Assistants for Algorithm Courses with Integrated Teaching, Learning, Assessment and Practice	Chao Peng, Kecheng Cai, Yaying Guo And Chenyang Xu	Algorithm courses are core components in undergraduate information technology-related majors. However, with the rapid development of artificial intelligence technology, traditional teaching methods for algorithm courses face new opportunities and challenges. This study explores the application of AI teaching assistants based on large language models in undergraduate algorithm courses, aiming to develop an innovative "teaching, learning, assessment, and practice integration" instructional model. Through designing intelligent teaching processes and developing an AI assistant system equipped with personalized guidance, real-time feedback, and adaptive learning capabilities, the study seeks mutual empowerment between algorithm teaching and AI technology. This model will significantly enhance students' learning efficiency and algorithmic thinking skills while strengthening their practical application capabilities in the AI domain. The re-search endeavors to provide theoretical insights and practical experiences valuable for the intelligent transformation of algorithm teaching in higher education.	PaD 2.4	2F-3rd MTG Room	Aug. 23	11:45	12:00

Parallel Discussion 3	**New digital technology's application**		**Saturday**	**Aug. 23**	**8:00-10:00**	**Online Room 3**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Speech Emotion Recognition Based on MGCC Features and ARIMA Algorithm	Hao Lou, Shaoping Shen, Tianle Zhang And Zhibin Li	With the advancement of smart devices, the demand for emotion recognition in human-computer interaction is continuously increasing. As an important medium of interaction, voice carries rich emotional information, thus Speech Emotion Recognition (SER) technology holds significant importance. This paper addresses the current issue of low recognition rates and proposes a method of generating Mel-Gamma Cepstral Coefficients (MGCC) features by fusing Mel-Frequency Cepstral Coefficients (MFCC) and Gamma-Frequency Cepstral Coefficients (GFCC) and validates it with the BiLSTM-Attention model. The experimental results show that MGCC features integrate the advantages of both, enhancing recognition rates and convergence speed. Furthermore, by predicting features with the ARIMA model and replacing some zero-padding data, the feature processing is optimized, further improving recognition performance.	PaD 3.1	Online Room 3	Aug. 23	8:00	8:15
Risk Assessment Study on Linkage Scenarios of Integrated Monitoring System Based on Fully Automatic Operation	Guo Changyou, Zhao Limin, Zheng Wenyan, Liu Shuai, Fu Guanhua And Liu Yidong	According to the characteristics of the fully automatic operation integrated monitoring system, this paper designs a set of comprehensive integrated monitoring system linkage scene risk comprehensive assessment model based on fuzzy theory. According to the main factors affecting the fully automatic operation of the comprehensive monitoring system, the scene design risk quantitative evaluation index system is established from the four system linkage scenarios of the vehicle system, the comprehensive monitoring system, the communication system and the platform gate system, and the comprehensive monitoring system based on the fully automatic operation is solved. System linkage risk assessment problem.	PaD 3.2	Online Room 3	Aug. 23	8:15	8:30
Design and Development of a General-Purpose Conversational System for Multi-Source Heterogeneous Data Analysis Powered by LLMs	Gangyi Zhang, Wengang Li, Xinzhou Ye, Gang Cen And Yuefeng Cen	Current enterprise data analysis faces challenges such as high barriers to using traditional business intelligence tools, complexity in unified processing of multi-source heterogeneous data, and semantic gaps between user queries and business terminology. To address this, designs a general-purpose conversational multi-source heterogeneous data analysis system based on large language models. The system employs pooling and embedding storage technologies to achieve unified management of heterogeneous data sources, builds an intelligent conversational report generation framework based on Multi-Agent architecture, optimizes retrieval-based question answering capabilities through self-correction mechanisms, and implements system reliability design based on LangGraph Directed Cyclic Graph. This effectively lowers data analysis barriers, improves analysis efficiency, and provides enterprises with convenient data analysis and visualization capabilities. The system shows broad application prospects in areas such as enterprise business decision-making, financial investment, healthcare, and educational analysis.	PaD 3.3	Online Room 3	Aug. 23	8:30	8:45
The Design and Development of the AI Interviewer System	Xinzhou Ye, Zhehao Mou, Haonan Jiang, Yuefeng Cen And Gang Cen	The contemporary workplace demonstrates increasingly diversified and specialized requirements for candidates' professional competencies and qualifications. A substantial proportion of job seekers, particularly recent graduates, experience interview anxiety, demonstrate unfamiliarity with interview protocols and procedures, and exhibit insufficient understanding of position-specific competency requirements, thereby expressing considerable demand for interview skill enhancement. To address these challenges, an AI-powered virtual interviewer system has been conceptualized, designed, and implemented.The system's core functionalities encompass specialized competency training for job seekers, real-time multimodal dialogue capabilities during simulated interviews, and comprehensive visualization of candidate competency profiles. From a technical perspective, the system operates as an intelligent interview training platform that leverages WebRTC technology for real-time audiovisual communication and employs a fine-tuned, domain-specific Large Language Model (LLM) optimized for interview scenarios. Developed utilizing Vue3 and Spring Boot within a decoupled frontend-backend architecture, this AI interviewer system facilitates candidate acclimatization to professional interview environments, enhances familiarity with discipline-specific assessment methodologies, and enables identification of competency deficiencies through comprehensive diagnostic analytics.	PaD 3.4	Online Room 3	Aug. 23	8:45	9:00
Research on UAV path planning and obstacle avoidance integrating PPO and DWA	Zhidong Wang And Shaoping Shen Shen	This paper addresses the issues of insufficient obstacle avoidance efficiency in traditional path planning algorithms (such as A* and RRT) for drones in complex environments, as well as the limited local obstacle avoidance flexibility of single deep reinforcement learning methods (such as PPO). It proposes a hybrid algorithm that integrates PPO with the Dynamic Window Algorithm (DWA). The main contributions are: (1) A configurable and randomized 3D training environment is constructed using Airsim and Unreal Engine, supporting the parametric generation of dynamic and static obstacles, which enhances training stability. (2) PPO is used for global path planning, while DWA generates local speed commands and provides feedback on feasible areas, forming a local guidance mechanism to enhance real-time obstacle avoidance capabilities. (3) A curriculum learning strategy is employed to optimize the reward function and guidance range in stages, accelerating model convergence and improving robustness in complex environments. This method significantly improves the autonomous navigation and obstacle avoidance performance of drones in dynamic scenarios.	PaD 3.5	Online Room 3	Aug. 23	9:00	9:15

Parallel Discussion 4	**Pedagogical strategies for education digital transformation**		**Saturday**	**Aug. 23**	**10:10-12:10**	**Online Room 1**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
Towards Next-Generation Computer Network Education: AI-Driven Reform	Jigang Wen, Kun Xie, Yuxiang Chen And Wei Liang	This paper explores the reform of computer network course instruction in the context of rapid technological advancement and interdisciplinary integration. Traditional teaching models are constrained by outdated theoretical content, weak practical components, and limited responsiveness to emerging technologies such as AI, IoT, cloud computing, and edge computing. To address these issues, a collaborative model combining instructor-led design and large language model (LLM) support is proposed. LLMs are used to assist with dynamic content updates, interdisciplinary case generation, and intelligent teaching resource construction. The reform focuses on three major aspects: restructuring curriculum content with real-world applications, integrating interactive learning and hands-on tasks, and aligning theoretical instruction with cross-domain problem-solving. The curriculum reform introduces flexible course structures and AI-supported personalized learning paths, along with the establishment of an online teaching and experimentation platform to sustain continuous updates and student engagement. This framework provides a replicable model for cultivating high-quality network professionals with solid theoretical foundations, practical competencies, and innovative capabilities in the AI era.	PaD 4.1	Online Room 1	Aug. 23	10:10	10:25

A Study on Teaching Models for Embedded Systems Courses Under the Guidance of Intelligent Educational Robots	Xiaochun Xu, Haibo Luo And Ping Fan	Amid the ongoing wave of the artificial intelligence revolution and industrial transformation, emerging industries are imposing increasingly stringent demands on the engineering design and innovation capabilities of computer science students. Despite having completed a broad spectrum of foundational courses—including C programming, Python programming, digital systems, and deep learning—many undergraduates continue to face difficulties in effectively integrating knowledge acquired from these diverse disciplines. To address this challenge, we propose the integration of intelligent educational robots into the junior-level Embedded Systems course. This initiative aims to enhance students' practical skills and foster innovative thinking through AI-driven instructional design, the development of innovative experimental projects, and the implementation of multi-dimensional achievement assessments. Additionally, it facilitates the seamless integration of foundational course knowledge. The course adopts a novel blended teaching model that combines "intelligent guidance" with "engineering practice", striving to overcome the limitations of conventional pedagogical approaches. This model seeks to establish a new AI-enhanced educational ecosystem and holistically advance students' comprehensive competencies and interdisciplinary proficiencies.	PaD 4.2	Online Room 1	Aug. 23	10:25	10:40
SS-GAN: a Text-to-Face Generation Method for Education Applications	Wang Hongxia, Wang Yu And Zhao Guanghui	With the rapid advancement of artificial intelligence (AI) and deep learning, text-to-face generation has emerged as a powerful tool for bridging natural language and visual content. It not only shows strong capabilities in image synthesis but also presents new opportunities for educational applications, including personalized instruction, history education, and digital literacy. However, current methods still face significant challenges, such as high computational cost in multi-stage models, low training efficiency, and unstable generation quality due to discriminator forgetting. To address these issues, we propose SS-GAN, which includes a skip-stage channel attention excitation module (SSE) and a self-supervised regularized discriminator (SSR). The SSE enhances feature learning by recalibrating channel weights across stages, connecting low- and high-resolution features for better performance. SSR improves discriminator stability by adding decoders trained with self-supervised loss, helping it learn richer facial features. Experiments show that SS-GAN achieves superior generation quality and training stability. Additionally, we explore its potential in educational scenarios, such as personalized virtual teaching assistants, historical figure visualization, and AI ethics education. By aligning technical innovation with educational needs, this work provides new directions and practical support for integrating AI into education. The code is available at https://github.com/caijiWY/SSE-SSR.	PaD 4.3	Online Room 1	Aug. 23	10:40	10:55
Paths and Strategies for reshaping the Teaching Process of Software Engineering Courses under the background of AI	Gongzheng Lu And Yang Yang	In order to solve the impact of artificial intelligence technology on the teaching process of software engineering courses, paths and strategies for reshaping the teaching process are proposed. The teaching process is reshaped mainly from five aspects: teaching objectives, teaching content, teaching resources, teaching mode and teaching evaluation, providing a reference for the teaching reform and practical research of software engineering courses under the background of artificial intelligence.	PaD 4.4	Online Room 1	Aug. 23	10:55	11:10
AI-assisted discrete mathematics teaching platform based on multimodal learning resources	Hulin Kuang, Hongdong Li, Min Zeng And Jianxin Wang	This paper proposes a discrete mathematics teaching platform based on a multimodal learning resource repository and the DeepSeek-RAG integration engine. The multimodal repository collects diverse data related to discrete mathematics, which undergoes preprocessing, annotation, and deep learning-based optimization (CNNs for images, RNNs for text or speech). Knowledge is stored using a dual-structure approach combining knowledge graphs and vector databases, enabling semantic association, intelligent retrieval, and inference of multimodal information. The DeepSeek-RAG integration engine combines retrieval-augmented generation (RAG) with the DeepSeek large language model to perform efficient sparse or dense retrieval, accurately locating relevant content within the multimodal repository. Through multimodal fusion, redundancy reduction, and enhanced relevance modeling, the engine generates results with improved contextual consistency, knowledge richness, and accuracy, effectively supporting retrieval, question answering, and assessment functionalities. Based on this platform, we propose a hybrid teaching model that integrates traditional instruction, intelligent platforms, and collaborative group learning, which has demonstrated significant effectiveness in practical teaching scenarios.	PaD 4.5	Online Room 1	Aug. 23	11:10	11:25
Design and development of AIGC-based intelligent teaching assistance system	Lihan Jiang, Gangyi Zhang, Xiangdong Li, Zhiqi Jin And Yuefeng Cen	As generative artificial intelligence (AIGC) becomes increasingly integrated into the education sector, Educational stakeholders are seeking more capable and intelligent assistance system. Traditional teaching assistance systems provide relatively limited support for after-class learning and lack systematicity and specificity. The content generated by AI-assisted tools tends to be fragmented, making it difficult to meet students' needs for personalized learning and continuous improvement. To address these issues, this paper designs and develops an intelligent educational assistance system based on AIGC. The system is centered around an AI Agent architecture, integrating user profile and local knowledge base technology to build a comprehensive system with adaptive learning capabilities and intelligent teaching support functions. The system consists of student, teacher, and management terminals, covering functions such as homework grading, exercise training, intelligent Q\&A, and resource sharing. The system aims to improve students' after-class learning outcomes and provide personalized learning path guidance. At the same time, it helps teachers improve teaching efficiency, reduce repetitive workloads, and promote the intelligent transformation of the teaching process.	PaD 4.6	Online Room 1	Aug. 23	11:25	11:40
Teaching Reform of Computer Curriculum System for Cultivating Students' Computer System Ability	Xing Liu, Xing Liu, Jianjun Chen, Qinglan Zhan And Mengling Chen	Computer system ability (CSA) can enable the students to design and analyze a computer problem from a system perspective, understand the integrity, hierarchy and relevance of different modules within a computer system, and master the collaboration between computer hardware and software. Since 2015, the CSA training proposal has been widely promoted in many Chinese universities, and has effectively improved the quality of college computer education. However, with the development of computer technologies such as artificial intelligence (AI) and big data, the traditional CSA training proposal cannot fully meet the needs of future computer education. To address this challenge, this paper improves and extends the currently widely used CSA training program. On the one hand, the traditional CSA proposal is improved by integrating the knowledge of more computer science (CS) courses and requiring students to build a more complex computer system. On the other hand, the traditional CSA proposal is extended by proposing a new additional CSA training program dedicated to AI professionals. The above improved and extended CSA training proposals have been implemented in the School of Computer Science and Artificial Intelligence of Wuhan University of Technology for more than five years, and the teaching quality evaluation results show that these proposals have effectively improved the quality of talent training for CS specialty.	PaD 4.7	Online Room 1	Aug. 23	11:40	11:55
Exploration of Data Science Course Teaching Based on the RAP Model	Wenxing Hong, Fan Xiao, Huan Wang and Binyue Cui	To meet the urgent demand for datascience talent in the bigdata era and to remedy the deficiencies of traditional teaching models, this paper analyzes key instructional pain points and proposes a triadic RAP instructional model integrating Resources (R), an AI assistant (A), and a practical Platform (P), respectively. By systematically unifying these components, the model effectively addresses existing instructional challenges and enhances both the quality and the efficiency of datascience courses.	PaD 4.8	Online Room 1	Aug. 23	11:55	12:10

Parallel Discussion 5	**Online learning and MOOCs**		**Saturday**	**Aug. 23**	**10:10-12:10**	**Online Room 2**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**

A Knowledge Graph-Based Study on the "Four-Step" Model for Practice-Oriented Teaching	Rui Wen, Yuefeng Cen, Jingjing Liang, Gangyi Zhang, Shuai Jiang And Gang Cen	Practical teaching is essential for talent development in higher education. However, the absence of an effective mentoring mechanism between senior and junior students, coupled with the underutilization of existing learning resources, results in low teaching efficiency and limited teacher engagement. To address these issues, a knowledge graph construction method based on the "Four-Step" Model for Practice-Oriented Teaching is proposed. By extracting key elements—such as practical projects, courses, and knowledge points—from diverse educational sources, a heterogeneous graph is constructed that represents multiple entity types and semantic relationships. HGNN is then used for node representation learning. The HGNN integrates relation-aware message passing and attention mechanisms, improving its ability to model complex teaching relationships. Experimental results show that the proposed method outperforms traditional graph neural networks in accuracy, F1 score, and AUC, demonstrating strong representation ability and practical value. HGNN provides a new technical approach for digitally modeling practical teaching in higher education.	PaD 5.1	Online Room 2	Aug. 23	10:10	10:25
Reflections on the Construction of Digital Courses for Older Adults Education	Junjie Cao And Zhonghua Jiang	This research focuses on the construction of digital courses for older adults education, aiming to address the "digital divide" and promote high-quality development in older adults education. It analyzes the current status, identifying challenges such as homogeneous course design, insufficient specialized resources, and lagging support systems. The study proposes key construction contents, including a multi-dimensional service system, integration of online-offline learning, integration of information technology, and strengthened digital learning guidance. Optimization paths are suggested, such as improving the "content + technology + service" framework, enhancing platform construction, establishing evaluation-driven management, and boosting teachers' digital capabilities. The research highlights the importance of user-centered design and interdisciplinary collaboration to create inclusive, intelligent digital education ecosystems for the older adults, facilitating their integration into the digital society and lifelong learning.	PaD 5.2	Online Room 2	Aug. 23	10:25	10:40
Constructing a Transportation-Oriented Artificial Intelli-gence Curriculum System: A Core Competency Perspec-tive	Hui Luo, Wei Zeng And Linjuan Wei	Amidst the intelligent transformation of the transportation industry, this research addresses the urgent demand for interdisciplinary talent in emerging fields such as smart transportation, autonomous driving, and transportation big data. By precisely defining the interdisciplinary convergence of Artificial Intelligence (AI) and transportation sciences, we establish a core competency framework for cultivating professionals in transportation-oriented Artificial Intelligence programs. Grounded in this framework, a dedicated transportation-oriented Artificial Intelligence curriculum system is developed. This initiative provides higher education institutions with a replicable "AI + Transportation" curriculum blueprint for Artificial Intelligence program development, advances industry-education integration for cultivating transportation-sector AI professionals, and supports China's national Transportation Powerhouse Strategy.	PaD 5.3	Online Room 2	Aug. 23	10:40	10:55
Cultivating Four-Dimensional Core Competencies of Undergraduate AI Talents under the Emerging Engineering Education Framework	Hui Luo, Wei Zeng And Chongwei Huang	Abstract. In response to the challenges faced by undergraduate artificial intelli gence (AI) education under the emerging engineering education (EEE) frame work—namely, fragmented knowledge acquisition, weak capability transfer, lack of systems thinking, and insufficient cultivation of core competencies—this study proposes a four-dimensional integrative model known as Knowledge–Abil ity–Thinking–Quality (K-A-T-Q). Building upon this model, a triadic, synergis tic development pathway is constructed, encompassing curriculum system re structuring, pedagogical innovation, and assessment mechanism transformation. Practical implementation demonstrates that this integrated approach significantly enhances students' capacity for knowledge integration, technical adaptability, systems thinking, and overall quality development, thereby offering a replicable and scalable model for advancing AI undergraduate education.	PaD 5.4	Online Room 2	Aug. 23	10:55	11:10
Analysis and Thinking about the Development Situation of HIS Course in Colleges of Traditional Chinese Medicine in China	Qingyan Wu, Haifeng Yang, Yan Xie And Wenping Deng	Amid significant national initiatives promoting digital health development, advancing New Engineering and New Medical Sciences, and accelerating educational digital transformation, enhancing the educational capacity and teaching quality of Hospital Information System (HIS) courses has become critically urgent. Through a comprehensive questionnaire survey targeting HIS course instructors at Traditional Chinese Medicine (TCM) universities and a systematic literature review of HIS teaching research, this study evaluates the current status of HIS course development in TCM institutions across six key dimensions: course nomenclature and provision, instructional scheduling, content emphasis, faculty composition, digital teaching platforms, textbook resources, and practical teaching implementation. The investigation identifies major challenges and gaps, culminating in proposed construction strategies and quality improvement measures for HIS curriculum enhancement	PaD 5.5	Online Room 2	Aug. 23	11:10	11:25
Practice Teaching Reform of Digital Circuit and Logic Design Course Guided by Hardware Thinking	Chunqing Ling, Huan Zhao, Hongping Hu And Yan Liu	In view of the current issues in the Digital Circuit and Logic Design course, such as students' weak practical abilities and lack of hardware thinking, this study proposes a practice teaching reform scheme guided by hardware thinking. By constructing a three-dimensional training framework for visualization ability of circuit behaviors, system design ability, and circuit implementation ability, combined with the hierarchical ability training system of FPGA bare board (including assembly, testing, and development), the students' fundamental understanding and engineering practice capabilities of hardware systems are strengthened. The teaching practice shows that the reform has significantly improved students' abilities to solve complex engineering problems and provides a reusable path for the training of digital system talents under the new engineering context.	PaD 5.6	Online Room 2	Aug. 23	11:25	11:40
Hybrid Online-offline Course Construction on "Compiler Principles"	Wenbi Rao, Yunhua Wang And Fuyang Li	The course "Compiler Principles" is designed to enhance students' system-level thinking in computer science and strengthen their ability to solve complex engineering problems. To achieve these objectives, we have structured the "Compiler Principles" course using a hybrid online-offline teaching model. In this paper, we first outline the constrcution of the hybrid online-offline course. Then, we present a teaching case that demonstrates the effectiveness of this model. Finally, we conclude this paper by sharing valuable experiences gained from implementing hybrid online-offline teaching.	PaD 5.7	Online Room 2	Aug. 23	11:40	11:55

Parallel Discussion 6	**E-society**		**Saturday**	**Aug. 23**	**10:10-12:10**	**Online Room 3**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
CNN-Transformer for Tool Wear Condition Recognition Based on Data Augmentation	Luyao Yuan, Haotian Lei And Yang Weng	With the advancement of Industry 4.0, the integration of manufacturing and intelligent technologies has become crucial for industrial upgrading. Tool wear in milling processes significantly impacts workpiece quality and accuracy. Therefore, online tool wear identification and real-time monitoring have emerged as vital research directions in intelligent manufacturing to enhance machining efficiency and reduce defects. This study proposes a tool wear condition monitoring model using Piecewise Cubic Hermite Interpolation Polynomial (PCHIP) for data augmentation, addressing the issue of insufficient tool wear data compared to sensor data. PCHIP establishes a one-to-one correspondence between sensor and tool wear data, preventing signal loss due to missing wear values and maximizing sensor data information utilization. The proposed CNN-Transformer model combines the rapid feature extraction and dimensionality reduction of Convolutional Neural Networks (CNN) with the long-term dependency learning of Transformer, enabling direct learning from sensor signal feature sequences without manual feature extraction. Experimental results show that the model achieves over 95% accuracy, outperforming the baseline model in all evaluation metrics, thus providing superior monitoring performance.	PaD 6.1	Online Room 3	Aug. 23	10:10	10:25

Leveraging Query Selection for Efficient Relationship Detection	Haotian Lei And Yang Weng	Visual relationship detection is a fundamental task in computer vision, focusing on identifying spatial and semantic relationships between objects within an image. While existing approaches primarily target human-object interactions, limited attention has been given to pairwise relationships among densely distributed objects—a setting common in real-world scenarios. Moreover, few models offer both high accuracy and efficient inference. To address these limitations, we propose a DETR-based visual relationship detection model that incorporates query selection to effectively model object-object interactions. Our approach simplifies the detection pipeline and enables end-to-end prediction without relying on region proposals or post-processing. In addition, we explore the application of this model in the field of document image understanding by constructing and annotating a dataset of office diagrams, including flowcharts, to support structured visual-text parsing. A series of experiments are conducted to evaluate the model's performance from multiple perspectives. Results demonstrate that the proposed method achieves accurate and robust relationship detection, even in images with high object density, while maintaining computational efficiency. These findings highlight the model's potential for broader applications in intelligent document analysis and digital office automation.	PaD 6.2	Online Room 3	Aug. 23	10:25	10:40
Implementation of A Procurement Demand Forecasting System Based on Dynamic Fusion of Multi-Source Data	Wei Zhou	Traditional procurement demand forecasting methods primarily rely on historical data and static models, making it challenging to respond in real-time and effec-tively to sudden events and rapidly changing market dynamics. This paper pro-poses a procurement demand forecasting method based on the dynamic fusion of multi-source data, which deeply integrates expert decision-making systems and web crawlers' technology. The main tasks include: 1.Utilizing web crawlers and API to dynamically obtain real-time information on earthquakes, weather, holi-days, etc., while combining pre-set strategies to comprehensively assess the cur-rent emergency situation or specific scenario.2.When external information trig-gers procurement forecasting, the system performs a detailed segmentation of demand, combining the materials database and Global Product Classification (GPC) standards to intelligently recommend the specific names, categories, pri-ority levels and recommended rationale.3.The system is built by using PyQt6, en-ables hourly automatic detection, seven-day procurement forecasts, querying past events, automatic report generation, and procurement strategy adjustments. Test results under various emergency scenarios show that the system achieves instan-taneous response in all types of emergency scenarios, and the procurement rec-ommendation results are highly consistent with actual needs.	PaD 6.3	Online Room 3	Aug. 23	10:40	10:55
Deep Attention Knowledge Tracing Based on Temporal Kolmogorov-Arnold Networks	Huamei Qi And Yalin Jing	As a fundamental task in adaptive learning systems, knowledge tracing (KT) involves predicting how well a student will perform based on their previous answering behavior. Deep knowledge tracing models in earlier studies are often built upon RNN architectures to represent the evolving knowledge states of learners. However, these models have limitations in capturing long-term dependencies and tend to fix the activation function to handle time steps without considering the time-decay effect of students' responses. Therefore, it is difficult to accurately characterize the complex behavior patterns of students and the dynamic evolution of their mastery of knowledge. To address these issues, this paper proposes a Deep Attention Knowledge Tracing model based on the Temporal Kolmogorov-Arnold Network (DATKAN-KT). The model first employs an attention mechanism to explore the relationships between the importance of historical student responses, while incorporating the time decay effect of their answers. Additionally, to learn more complex dependencies in long sequences of student responses, The model employs the Temporal Kolmogorov-Arnold Network to capture students' evolving knowledge representations from long answer sequences, with the goal of predicting future response outcomes. To evaluate the proposed model's effectiveness, extensive experiments were conducted on multiple publicly available KT datasets. The evaluation shows that DATKAN-KT performs more effectively than existing KT models in four public datasets and remains robust when handling extended answer sequences, underscoring its ability to capture the evolving knowledge states of students.	PaD 6.4	Online Room 3	Aug. 23	10:55	11:10
A Integrated Supervisory Control System information security level protection technology solutions	Zhao Limin, Guo Changyou, Zheng Wenyan, Liu Shuai, Fu Guanhua And Liu Yidong	According to the requirements of information security level protection related systems and standards, this paper focuses on the business requirements of the rail transit Integrated Supervisory Control System, and carries out the design of equal protection level 3 program from the aspects of security technology and security management, respectively. In terms of security technology, the three aspects of security protection, security detection and security audit are designed to meet the requirements of network security, host security and application security. In terms of security management, a series of processes, systems, operating procedures, forms and records are sorted out in five aspects, namely, security management system, security management organization, personnel security management, system construction management, and system operation and maintenance management, to satisfy the requirements of information security management, and to provide a similar reference for the information security level protection program of other similar systems.	PaD 6.5	Online Room 3	Aug. 23	11:10	11:25
Research on Data Mining and Analysis Methods for Approved Foods for Special Medical Purposes in China	Zhouxuan Chen, Qianmeng Ruan, Gang Cen, Shuaijie Jiang And Yufan Chen	To optimize document and data analysis for Foods for Special Medical Purposes (FSMP), this study develops a multimodal framework integrating data mining and analysis. For information mining, a dual-modality model (combining visual and geometric features) was constructed based on pdfplumber technology, addressing cross-page table fragmentation and unit omission issues. By incorporating an improved conditional random field algorithm, high-accuracy reconstruction of complex document structures was achieved. For data analysis, a multidimensional evaluation framework was established, integrating econometric and nutritional metrics. Intervention analysis, entropy theory, and kernel density estimation were introduced to reveal inherent patterns in China's special medical food market development. This methodology provides a structured database for future research and is extensible to intelligent document processing in healthcare.	PaD 6.6	Online Room 3	Aug. 23	11:25	11:40
A Data Fusion and Sharing-Exchange Model for Public Health Emergency Management	Chao Li, Shuhui Wang, Jian Zhang, Xin Wei And Chunxiao Xing	This paper establishes an overall architecture of a data fusion and sharing-exchange model for public health emergenScy management to support the needs of future public health emergency management. Specifically, we will expand the traditional fusion and sharing methods that are solely data-driven or purely knowledge-driven, and integrate public health emergency data, multimodal public health emergency data, natural language processing, and semantic services into a unified framework.	PaD 6.7	Online Room 3	Aug. 23	11:40	11:55

Online Poster Session 1			**Sunday**	**Aug. 24**	**8:00-10:00**	**Online Room 1**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**
GAI-Empowered BOPPPS Teaching Model and Teaching Practice in Classroom Teaching Scenarios	Qingzheng Xu, Yufeng Ma, Na Wang, Weihu Zhao And Peilei Liu	Aiming at the teaching realities of traditional classroom teaching scenarios in the era of digital intelligence, a GAI-empowered teaching model is proposed in this study. Taking "heuristic search" as an example of teaching content, it elaborates in detail on the interactive processes of both teachers and students at each stage of this teaching model, as well as the effectiveness of applying this model to course teaching practice.	PoS 1.1	Online Room 1	Aug. 24	8:00	8:15

Predicting the Impact of Artificial Intelligence on Employment Structure under Population Decline UsingMultivariate Regression	Changwei Yang And Mingzhi Mao	Against the backdrop of accelerating population decline and aging in many countries, artificial intelligence (AI) is rapidly reshaping labor market dynamics. This paper investigates the impact of AI diffusion on job replacement and net employment change in low-fertility societies. Using composite AI adoption metrics derived from OECD statistics, IFR reports, and national labor surveys, we build a multivariate linear regression model to quantify how AI penetration, total fertility rate, and education level affect labor outcomes. Empirical results show that AI penetration significantly increases job replacement risk, especially in routine-intensive sectors, while higher education levels and AI-related investment are associated with net job growth. The model achieves an average test R^2 of approximately 0.8, indicating strong predictive performance and generalizability. This study highlights the dual role of AI as both a disruptive and enabling force in shrinking labor markets and provides quantitative evidence for policymakers to balance automation and employment resilience. The findings contribute to both AI economics and labor policy discourse under demographic transition.	PoS 1.2	Online Room 1	Aug. 24	8:15	8:30
Intelligent Teaching Assistant System of Computer Systems Course Based on Large Language Model	Kehua Yang, Huan Zhao, Lida Huang, Xiongren Xiao, Guoxi Xie And Yang Xu	As a core course of computer science and technology, computer system has the characteristics of strong theory and high degree of abstraction. This paper focuses on the difficulties in the teaching procedure of computer system course, designs and implements a teaching assistant system based on large language model. The system is based on large model fine-tuning and multi-model collaboration technology to improve the accuracy of question answering. At the same time, the system supports natural language question answering, teaching content retrieval and other functions, which effectively improves the teaching efficiency and students 'autonomous learning ability. The experimental results show that the system has good usability in the actual question answering scene, which provides a practical reference for the landing of big models in education scenes.	PoS 1.3	Online Room 1	Aug. 24	8:30	8:45
Innovation and Practice of the Full-process Management Framework for Graduate Education	Zhe Wang, Huiying Lv, Yuhong Zhong, Xiaohua Liu And Rui Zhang	The Era of Artificial Intelligence places great emphasis on the high-quality development of graduate education, and improving the quality of graduate cultivation has become a key focus in degree program work. This paper revolves around the construction and practice of a comprehensive graduate training mechanism, with a particular focus on the practical experiences of colleges in enhancing graduate cultivation quality through the formulation of various management policies and the implementation of a diversified evaluation indicator system.	PoS 1.4	Online Room 1	Aug. 24	8:45	9:00
AI-Enhanced Production-Oriented Approach for Feedback and Assessment in EFL Writing	Wenhan Pan, Mingzhi Mao And Niansheng Cheng	An AI-enhanced Production-Oriented Approach (POA) framework is pro-posed to improve English as a Foreign Language (EFL) writing instruction in higher education. By aligning POA's motivating–enabling–assessing cycle with large language models such as GPT-4, the framework facilitates task-based, feedback-driven, and adaptive learning experiences. Implemented through a design-based research methodology in a university writing course, the framework led to measurable improvements in students' writing perfor-mance, engagement with formative feedback, and learner autonomy. The re-sults suggest that AI functions as an instructional augmentation rather than a replacement, offering scalable support for individualized scaffolding and functional feedback. The work contributes to smart language pedagogy by bridging pedagogical theory with AI capabilities and connecting human-led instruction with intelligent learning support.	PoS 1.5	Online Room 1	Aug. 24	9:00	9:15
Research on AI-Driven Hierarchical Teaching Mode: A Case Study of Database Principles Course	Wei Yan	To address the issue of unsatisfactory teaching effectiveness caused by the "one-size-fits-all" approach in traditional Database Principles course teaching, this paper proposes an AI-driven hierarchical teaching mode. By constructing a hierarchical teaching resource recommendation system based on student ability models and combining real-time learning situation analysis, complex teaching contents such as SQL practical operations and relational normalization theory are dynamically adjusted in difficulty and explained in a differentiated manner. Relying on the case of an AI teaching assistant in a university, this paper elaborates on the design concept, implementation process, and technical realization methods of this mode. Experimental results indicate that this mode significantly enhances the learning effectiveness and enthusiasm of students at different levels, providing new ideas and practical references for the reform of university curriculum teaching.	PoS 1.6	Online Room 1	Aug. 24	9:15	9:30
An Innovative Models for AI-Oriented Information Security Practical Capabilities Development	Pengcheng Liu, Yongwei Wang, Xiaohu Liu And Hao Hu	Amidst the continuous advancement of artificial intelligence (AI) technologies driving social development, cultivating innovative talents oriented towards the AI era has become an unprecedented challenge for computer technology disci-plines. As a multidisciplinary field, the traditional curriculum system and knowledge structure in computer technology education have demonstrated rel-ative lag compared to the rapid evolution of AI technologies. To address this issue, we propose a 'four-dimensional integrated' training model from the per-spective of professional development. Focused on enhancing innovation capa-bilities of computer technology students in the AI era, the model integrates four strategic components: curriculum system reconstruction, advanced peda-gogical optimization, practical training innovation, and teaching methodology empowerment. The effectiveness of this training framework is rigorously vali-dated through systematic implementation in contemporary educational prac-tices.	PoS 1.7	Online Room 1	Aug. 24	9:30	9:45
Research on the Growth Path of Network Practical Capacity Based on Tridimensional Pedagogical Model	Yongwei Wang, Yuchen Zhang, Pengcheng Liu And Mei Wang	Information technology innovation characterized by digital intelligence has opened up a new track for economic and social development. How to cultivate innovative talents facing the digital intelligence era has become a modern higher education. As an interdisciplinary engineering specialty, network engi-neering specialty especially needs to cultivate innovative talents to adapt to the rapid development of digital intelligence technology and network security situation. Based on the construction of network engineering specialty, we con-structs a path for the growth and training of innovative talents with "ability traction, system remodeling, and digital intelligence empowerment" by taking the cultivation of innovative ability as the goal, the reconstruction of curricu-lum system as the construction basis, the innovation of practice as the con-struction foothold, and the empowerment of teaching methods as the construc-tion supplement, so as to promote the updating and adjustment of professional knowledge system structure, and test the effectiveness of the training mode through a new round of teaching implementation.	PoS 1.8	Online Room 1	Aug. 24	9:45	10:00
Data-Driven I^3 Framework: Modeling and Visualization for Applied Higher Education	Yundi Guo, Xianghua Fu And Yongsheng Liang	In the context of modern industrial system development and economic transformation, higher education faces three major challenges in cultivating applied talents: limited internationalization, insufficient integration between industry and education, and weak connections between innovation and teaching. Many institutions struggle with decision-making due to a lack of effective feedback mechanisms for tracking educational development. This paper introduces the I^3 (Internationalization, Integration, Innovation) Higher Education Development Assessment Model, which is based on constructivist learning theory, Bloom's taxonomy, and behaviorist learning principles. The model uses data-driven methods and visualization tools to monitor talent development indicators and provide evidence-based support for educational decision-making. Research results show that the model effectively improves the quality of applied talent training and supports sustainable institutional growth.	PoS 1.9	Online Room 1	Aug. 24	10:00	10:15

Online Poster Session 2			**Sunday**	**Aug. 24**	**10:15-12:00**	**Online Room 1**	
Title	**Authors**	**Abstract**	**Session**	**Room**	**Date**	**Start**	**End**

Construction and optimization path of digital literacy index system for securities practitioners	Yifeng Yan And Ning Wang	The cultivation of digital literacy among securities practitioners plays a significant role in enhancing work efficiency, preventing financial risks, promoting business innovation, and elevating brand value. In constructing the indicator system, we adopted UNESCO's digital literacy framework as the theoretical foundation and incorporated specific guidance on digital literacy and skills from the Cyberspace Administration of China. This integration resulted in 28 indicators and a tailored digital literacy assessment framework for the securities industry. To evaluate the relative importance of these indicators, we explored the application of the entropy method for determining indicator weights. Leveraging the inherent characteristics and information content of the data itself, the entropy method enables objective and equitable weight allocation, thereby enhancing the accuracy and credibility of assessments. This study proposes optimization strategies for improving digital literacy among securities practitioners, including: formulating detailed training plans, implementing targeted digital literacy programs, conducting regular effectiveness evaluations, establishing incentive mechanisms and support systems, and refining the digital literacy framework.	PoS 2.1	Online Room 2	Aug. 24	10:15	10:30
Logical Construction and Practical Design of the BOPPPS Teaching Model Based on the "Four Principles and Three Methods" Concept: A Case Study of "Java Framework Technology"	Xianmei Hua And Xinrong Zhan	In response to challenges including outdated teaching content, insufficient cultivation of practical skills, and unitary assessment methods in traditional "Java Framework Technology" courses, this research constructs a teaching framework for applied talent cultivation by integrating the BOPPPS Teaching Model under the guidance of the "Four Principles and Three Methods" Concept (FT Concept). By analyzing the requirements for developing an enterprise-level Contract Management System, we transform industry standards into a BOPPPS closed-loop teaching process. A task-driven mechanism based on specialized role assignment and a multi-dimensional assessment system are designed. Focused on logical construction and practical design, this research deepens technical application understanding via real project scenarios, integrates knowledge transfer paths through systematic workflows, bridges technical theory and engineering practice effectively, enhances students' engineering mindset, and provides replicable structured reform solutions for similar courses.	PoS 2.2	Online Room 2	Aug. 24	10:30	10:45
Robust object detection via source-free domain adaptation in SAR data	Yue Huang And Qingfeng Cai	In recent years, with the rapid development of deep learning, computer vision has achieved unprecedented success. The continuous progress in domain adaptation techniques has provided powerful technical support for Synthetic Aperture Radar (SAR) target detection. This paper investigates a source-free domain adaptation setting for SAR target detection. First, a mean-teacher framework is employed to effectively transfer knowledge from the source-trained model to the target domain. To enhance the feature representation of target domain data, a novel training strategy is proposed, leveraging the idea of graph-guided contrastive learning. To better capture the relationships among proposed instances, this paper presents an Instance Relation Graph Network based on Graph Convolutional Networks (GCNs), which models the inter-instance dependencies effectively. By learning the relationships between instances, positive and negative proposal pairs can be obtained to guide the contrastive representation learning process. Finally, the proposed method is compared with existing domain adaptation approaches. Experimental results demonstrate that the proposed method can effectively adapt a source-trained detector to the target domain, validating its effectiveness and superiority. Moreover, the results highlight the potential of graph-guided contrastive learning in source-free domain adaptation for SAR target detection.	PoS 2.3	Online Room 2	Aug. 24	10:45	11:00
Experimental Platform for Structural Health Monitoring in IoT Engineering	Jin Qian, Chengfei Cai, Yan Xu, Hui Li, Xiaoshuang Xing And Shuai Liu	This article presents the design and implementation of an experimental learning environment for structural health monitoring (SHM) of large-scale buildings within the Internet of Things (IoT) engineering curriculum. In response to the Chinese National Strategy for Educational Digitalization, this research addresses key challenges in traditional IoT experimental teaching, including limited equipment availability, complex real-world scenarios, and high operational risks. The article propose a hybrid virtual-physical simulation platform modeled after the Taizhou Bridge. The platform aligns with national digital education initiatives and overcomes the constraints of physical experimentation regarding equipment scale and environmental complexity. It adopts a student-centered, problem-oriented approach that addresses instructional challenges related to interdisciplinary knowledge integration, engineering practice transformation, and repeatable experimental validation. Simulation results demonstrate that the environment enhances students' understanding of large-scale IoT systems and cultivates system-level design thinking through scenario-based, task-driven learning. This platform provides an innovative pathway for cultivating application-oriented talent in IoT engineering.	PoS 2.4	Online Room 2	Aug. 24	11:00	11:15
3D-MLV: Single Stage 3D Visual Grounding Using Multi-scale Local Voting	Qi A, Sanyuan Zhao And Ken Yang	3D Visual Grounding (3DVG) involves identifying corresponding objects within a three-dimensional point cloud based on natural language descriptions. Most existing approaches focus on two-stage methods, but their performance is heavily dependent on the quality of the object detector. In contrast, single-stage methods directly perform cross-modal inference from the point cloud, thereby bypassing the need for object detectors and preserving surrounding environmental information during the point cloud filtering process. However, single-stage methods remain relatively underexplored. The main challenges include: (1) the difficulty in aligning point cloud features with language features across modalities, and (2) the inability of traditional Transformer structures to effectively model the local relationships between objects of different sizes within the 3D scene. To address these challenges, we propose \textbf{3D Multi-scale Local Voting (3D-MLV)}, a single-stage 3DVG method that employs a multi-scale local voting mechanism. This method leverages the encoder of a 3D object detector for deep feature encoding. To achieve effective cross-modal alignment, we design an optimization framework that incrementally incorporates language information into the point cloud feature vector. Additionally, we introduce a Transformer-based multi-scale local voting mechanism for seed point selection. Unlike traditional global attention, this mechanism focuses on local information around key points and encodes multi-scale contextual features through multi-head attention. Experimental results demonstrate that the 3D-MLV approach significantly enhances the performance of single-stage 3DVG.	PoS 2.5	Online Room 2	Aug. 24	11:15	11:30
Design of Series Experiments on Autonomous Driving for Teenagers	Zhuo Chen	Autonomous driving is a complex system that integrates various technologies, such as artificial intelligence (AI), the Internet of Things (IoT), big data, and au-tomatic control. We conducted research on the information technology curricu-lum, career planning, and skill cultivation for K12 Schools towards teenagers in both China and the USA. Based on these findings, we designed a series of exper-iments on autonomous driving, covering hardware, software, test, data, and algo-rithms. These experiments are tailored to match the ability characteristics of teen-agers. The objective of the project is to assist teenagers in enhancing their IT and cognitive abilities through practical experiments, and to guide them towards be-coming future engineers.	PoS 2.6	Online Room 2	Aug. 24	11:30	11:45
The Implementation of Teaching Supervision Work in a Secondary College—Takingthe School of Computer and Information Science of Anhui Polytechnic University as an Example	Ping Zhang, Liu Tao, Jiashu Dai And Lili Fan	The teaching supervision system has functions like diagnosis, feedback, supervision, evaluation, and promoting improvement. But there are difficulties in implementing it. Focusing on secondary college supervision,the School of Computer and Information Science of Anhui University of Technology and Science has applied student - centered, output - oriented, and continuous - improvement concepts. It has comprehensively supervised educational and teaching work. The school aims to improve teaching quality by following teaching laws. It requires students to be more engaged, teachers to enhance their abilities, management to be stricter, and teaching outcomes to be more practical.	PoS 2.7	Online Room 2	Aug. 24	11:45	12:00

Practice Teaching Reform of Software Engineering Specialty under the background of "AI+New Engineering"	Yunhua Wang And Shuguang Tao	With the continuous development of artificial intelligence (AI) technology, its application in the field of software engineering has become increasingly widespread. This paper aims to comprehensively and deeply explore the application of AI in the practical teaching of software engineering, and construct a "one body, two wings" architecture and a multi-level practical teaching system for software engineering under the context of "New Engineering". It proposes a multi-subject, multi-channel, and multi-stage practical teaching model based on school-enterprise cooperation, internships, and innovation and entrepreneurship education. Combining the teaching practices of this major, it introduces strategies, ideas, and methods for practical teaching reform from aspects such as the reform of the practical teaching system, innovation and entrepreneurship practical education, school-enterprise cooperation in new engineering.	PoS 2.8	Online Room 2	Aug. 24	12:00	12:15
Design of Secure Beamforming for the IRS-assisted System of Simultaneous Wireless Information and Power Transfer under Hardware Impairments	Taotao Li, Yanggeng Dong And Zhihui Ge	In order to improve the security of simulated wireless information and power transfer communication systems and overcome the impact of hardware impairments (HIs) on the system transceiver, a secure beamforming design method for SWIPT systems assisted by intelligent reflecting surface (IRS) under hardware impairments was proposed.With the goal of maximizing system secrecy rate, this method jointly optimized the beamforming vector of the base station(BS), artificial noise vector, and IRS phase shift matrix, and constructed a secrecy rate optimization problem under multiple constraints such as maximum transmit power of the BS, the minimum receiving energy of the energy harvesting receiver, and IRS phase shift. Considering that the optimization problem is non convex and the variables are coupled, an effective algorithm based on alternating optimization and semi-definite relaxation (SDR) is proposed to solve this problem suboptimally. Firstly, the original optimization problem is decomposed into two sub problems using alternating optimization. The first sub problem solves the beamforming vector and AN vector of the BS transmission, and the second sub problem solves the auxiliary vector of the IRS reflection coefficient. Finally, the SDR method is used to handle non convex constraints, and the alternating optimization method is employed to solve the subproblem. Simulation results show that the proposed method can guarantee the energy harvesting requirement, improve the security of system and mitigate the impact of hardware impairments.	PoS 2.9	Online Room 2	Aug. 24	12:15	12:30
TrustPHR：Trustworthy Management and Shared Utilization of PHR Based on Blockchain	Fei Zhao, Yuhan Wang And Tianyi Zang	Objective: To achieve trusted autonomy in health man agement services using blockchain technology. Methods: To ensure the trustworthiness and traceability of medical examination data generation and avoid redundant examinations due to data security concerns, this paper constructs a novel method for tracing medical examination data. To guarantee data integrity and security, the IPFS distributed data storage system is used in conjunction with blockchain smart contracts to record the traceability of the data generation process. Results: The Hash Chain-Based Data Traceability Algorithm demonstrates significant advantages in blockchain data tracing. In a blockchain network containing 10,000 transactions, this algorithm improves execution time by approximately 10 times compared to traditional methods; concurrently, resource consumption is reduced by about 50%. Conclusion: This paper proposes a blockchain-based traceability model for personal medical examination data, effectively resolving the issues of trust, privacy, security, and efficiency faced by medical examination data.	PoS 2.10	Online Room 2	Aug. 24	12:30	12:45

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Deep Attention Knowledge Tracing Based on Temporal Kolmogorov-Arnold Networks	Huamei Qi And Yalin Jing	Parallel Discussion 6	PaD 6.4	Online Room 3	Aug. 23	10:55	11:10
Design and Development of a General-Purpose Conversational System for Multi-Source Heterogeneous Data Analysis Powered by LLMs	Gangyi Zhang, Wengang Li, Xinzhou Ye, Gang Cen And Yuefeng Cen	Parallel Discussion 3	PaD 3.3	Online Room 3	Aug. 23	8:30	8:45
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Design and Implementation of Bidirectional Intelligent Sign Language Recognition Gloves Based on Multi-Sensor Fusion and Artificial Intelligence	Guochen Zhang, Rui Wen, Qi Zhou, Gang Cen, Junyan Luo And Zhiqi Jin	Parallel Discussion 2	PaD 2.3	2F-3rd MTG Room	Aug. 23	11:30	11:45
Design and Practice of Railway Track Visual Detection Science Popularization Teaching AIDS for Youngsters	Wenjuan Peng	Invited Session 1	InS 1.2	3F-SCR	Aug. 22	14:45	15:00
Design of Secure Beamforming for the IRS-assisted System of Simultaneous Wireless Information and Power Transfer under Hardware Impairments	Taotao Li, Yanggeng Dong And Zhihui Ge	Online Poster Session 2	PoS 2.9	Online Room 2	Aug. 24	12:15	12:30
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Exploration and Practice of Aesthetic Education in College Computer Courses from the Perspective of AI	Yu Niefang, Li Xiaomei And Peng Xiaoning	Invited Session 3	InS 3.4	2F-3rd MTG Room	Aug. 22	17:00	17:15
Exploration of Data Science Course Teaching Based on the RAP Model	Wenxing Hong, Fan Xiao, Huan Wang and Binyue Cui	Parallel Discussion 5	PaD 4.8	Online Room 1	Aug. 23	11:55	12:10
Exploring an Intelligent and Innovative Programming Teaching Model Based on Agent Programming Paradigm	Xin Xie, Yuantao Chen, Lixia Luo And Yonghui Cui	Invited Session 4	InS 4.1	Online Room 2	Aug. 23	8:00	8:15

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GPE-DKT: An Enhanced Deep Knowledge Tracing Model Integrating Generalized Training and Personalized Fine-Tuning for Learning Assessment	Xin Dong, Qing Zhang And Dapeng Qu	Invited Session 2	InS 2.2	Online Room 1	Aug. 23	8:15	8:30

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High-Frequency EEG Biomarkers of Cognitive Function Revealed by Wavelet Analysis	Kakeru Amano, Yasuyuki Matsuura, Kuwon Sumi, Akihiro Sugiura, Hirofumi Tahara And Hiroki Takada	Special Session	SpS 1.6	3F-SCR	Aug. 22	17:45	18:00
High-speed Reading Aloud as a Pedagogical Strategy for Enhancing Cognitive and Expressive Language Skills in Non-Kanji Background Learners	Kenichiro Kutsuna, Kunaj Somchanakit, Yoko Honda And Hiroki Takada	Special Workshop 2	SpW 2.2	2F-3rd MTG Room	Aug. 22	14:50	15:10
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Integration of Computational Thinking and Artificial Intelligence in General Education: A Case Study of "Introduction to Computing and Artificial Intelligence" at Hunan University	Yuhui Cai And Juan Luo	Invited Session 3	InS 3.1	2F-3rd MTG Room	Aug. 22	16:30	16:45
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Interesting Teaching of Algorithm Courses Supported by Syllabus, Textbooks and Cases	Xiong Li, Kun Rao, Hui Song And Juan Zhou	Invited Session 4	InS 4.3	Online Room 2	Aug. 23	8:30	8:45

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Leveraging Query Selection for Efficient Relationship Detection	Haotian Lei And Yang Weng	Parallel Discussion 6	PaD 6.2	Online Room 3	Aug. 23	10:25	10:40
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On the Design of AI Teaching Assistants for Algorithm Courses with Integrated Teaching, Learning, Assessment and Practice	Chao Peng, Kecheng Cai, Yaying Guo And Chenyang Xu	Parallel Discussion 2	PaD 2.4	2F-3rd MTG Room	Aug. 23	11:45	12:00

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Paths and Strategies for reshaping the Teaching Process of Software Engineering Courses under the background of AI	Gongzheng Lu And Yang Yang	Parallel Discussion 5	PaD 4.4	Online Room 1	Aug. 23	10:55	11:10
Practice Teaching Reform of Digital Circuit and Logic Design Course Guided by Hardware Thinking	Chunqing Ling, Huan Zhao, Hongping Hu And Yan Liu	Parallel Discussion 4	PaD 5.6	Online Room 2	Aug. 23	11:25	11:40
Practice Teaching Reform of Software Engineering Specialty under the background of "AI+New Engineering"	Yunhua Wang And Shuguang Tao	Online Poster Session 2	PoS 2.8	Online Room 2	Aug. 24	12:00	12:15
Predicting the Impact of Artificial Intelligence on Employment Structure under Population Decline UsingMultivariate Regression	Changwei Yang And Mingzhi Mao	Online Poster Session 1	PoS 1.2	Online Room 1	Aug. 24	8:15	8:30

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Research on AI-Driven Hierarchical Teaching Mode: A Case Study of Database Principles Course	Wei Yan	Online Poster Session 1	PoS 1.6	Online Room 1	Aug. 24	9:15	9:30
Research on Data Mining and Analysis Methods for Approved Foods for Special Medical Purposes in China	Zhouxuan Chen, Qianmeng Ruan, Gang Cen, Shuaijie Jiang And Yufan Chen	Parallel Discussion 6	PaD 6.6	Online Room 3	Aug. 23	11:25	11:40
Research on Key Algorithms for Text Auto-Correction Based on DeepSeek	Yuejuan Wei, Bin Zhang, Qing Li And Yan Qiang	Invited Session 1	InS 1.5	3F-SCR	Aug. 22	15:30	15:45
Research on the Growth Path of Network Practical Capacity Based on Tridimensional Pedagogical Model	Yongwei Wang, Yuchen Zhang, Pengcheng Liu And Mei Wang	Online Poster Session 1	PoS 1.8	Online Room 1	Aug. 24	9:45	10:00
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SS-GAN: a Text-to-Face Generation Method for Education Applications	Wang Hongxia, Wang Yu And Zhao Guanghui	Parallel Discussion 5	PaD 4.3	Online Room 1	Aug. 23	10:40	10:55

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The Design and Development of the AI Interviewer System	Xinzhou Ye, Zhehao Mou, Haonan Jiang, Yuefeng Cen And Gang Cen	Parallel Discussion 3	PaD 3.4	Online Room 3	Aug. 23	8:45	9:00
The Implementation of Teaching Supervision Work in a Secondary College—Takingthe School of Computer and Information Science of Anhui Polytechnic University as an Example	Ping Zhang, Liu Tao, Jiashu Dai And Lili Fan	Online Poster Session 2	PoS 2.7	Online Room 2	Aug. 24	11:45	12:00
Toward System- and Theory-Oriented Talent Cultivation in Computing	Yu Zhang	Special Session	SpS 1.7	3F-SCR	Aug. 22	18:00	18:15
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Visualizing Visual Function and Aging Using fMRI	Akihiro Sugiura, Yuta Umeda, Saki Hayakawa, Yuna Takagi, Masahiro Suzuki, Masami Niwa, Kunihiko Tanaka And Hiroki Takada	Special Workshop 1	SpW 1.3	3F-SCR	Aug. 23	10:10	10:30

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