IEIR 2024

MACAU

IEEE

Advancing Technology for Humanity

Conference Program

IEIR 2024

International Conference on Intelligent Education and Intelligent Research

华中师范大学人工智能教育学部
Faculty of Artificial Intelligence in Education,CCNU

华中师范大学伍伦贡联合研究院
Central China Normal University Wollongong Joint Institute

湖北省智能科教研究会
Hubei Society of Artificial Intelligence for Research and Education

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- Xiaopan Lyu, Central China Normal University
- Yong Zhang, Central China Normal University
- Zhenquan Shen, Central China Normal University

Guidance to Attend IEIR 2024

- IEIR 2024 will be held from November 6th to 8th, 2024 on World Sports University Limited, Macau Daily Building, Macau SAR, China.
- There is also a synchronous virtual online meeting and the online Tencent meeting information are as follow:

  Hall1: Tencent meeting ID：698 470 452 Password: 202411

  Hall2: Tencent meeting ID：691-491-224 Password: 202411
- Each Oral presentation, **10 minutes for presentation and 5 minutes for Q&A.**
- **Please note that all accepted papers must meet the camera-ready requirements and must give an on-site oral or online presentation as required before they can be published.**

Join WeChat Group for IEIR 2024

- WeChat Group for IEIR 2024 is set up to provide prompt responses for issues related with this conference. Two example issues are network disconnection and announcement.
- Please scan the QR code below to join the WeChat group.
- Joining the WeChat group is highly recommended; however, it is not compulsory.
- Announcements will also be posted on the IEIR 2024 website.
- Best papers and best student papers will be announced during the conference.

The QR Code of the WeChat Group

群聊：IEEE IEIR 2024
Participants

该二维码7天内(11月4日前)有效，重新进入将更新

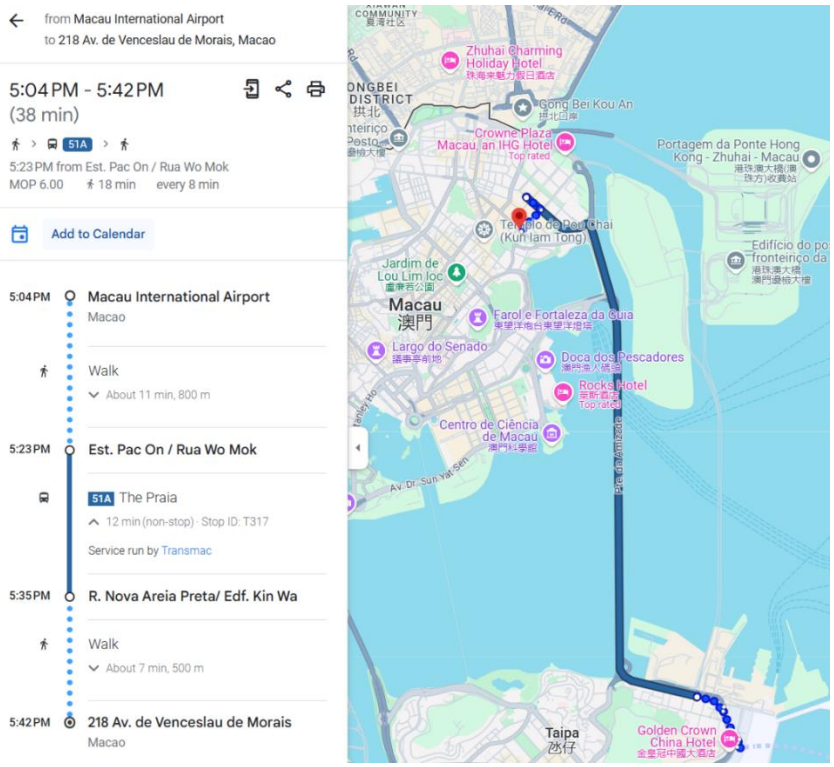
Conference Venue

- **Av. Venceslau de Morais, n. 218, 16th Floor Macau Daily Building, Macau SAR, China.** 澳门慕拉士大马路 218 号 A，澳门日报大楼 16 楼

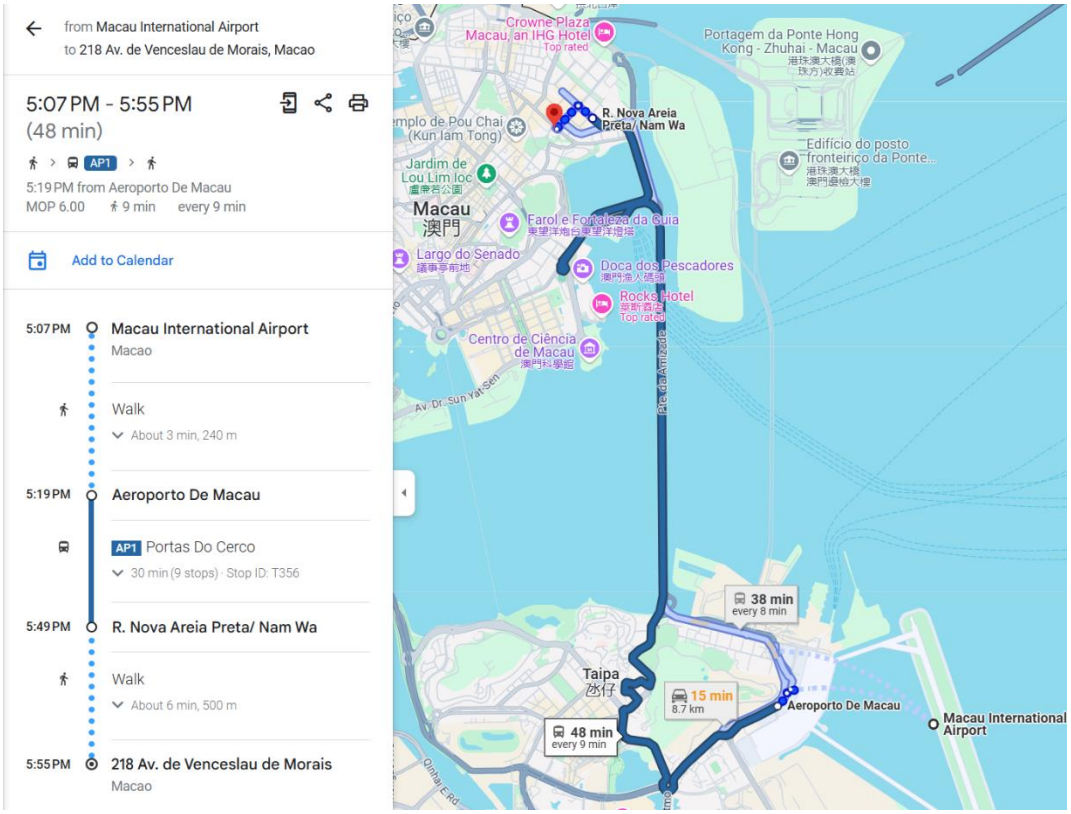
- **Transportation Guidance**

From Macau Airport:

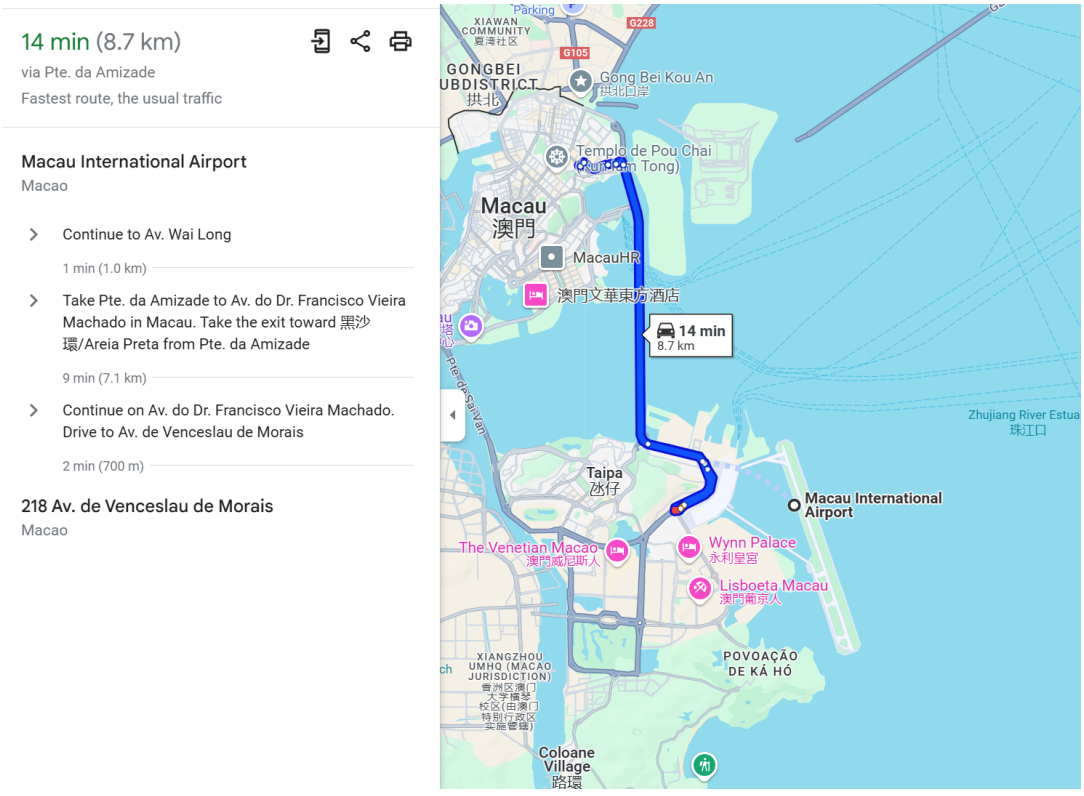
(1) BUS 51A MOP 6



(2) BUS AP1 MOP 6

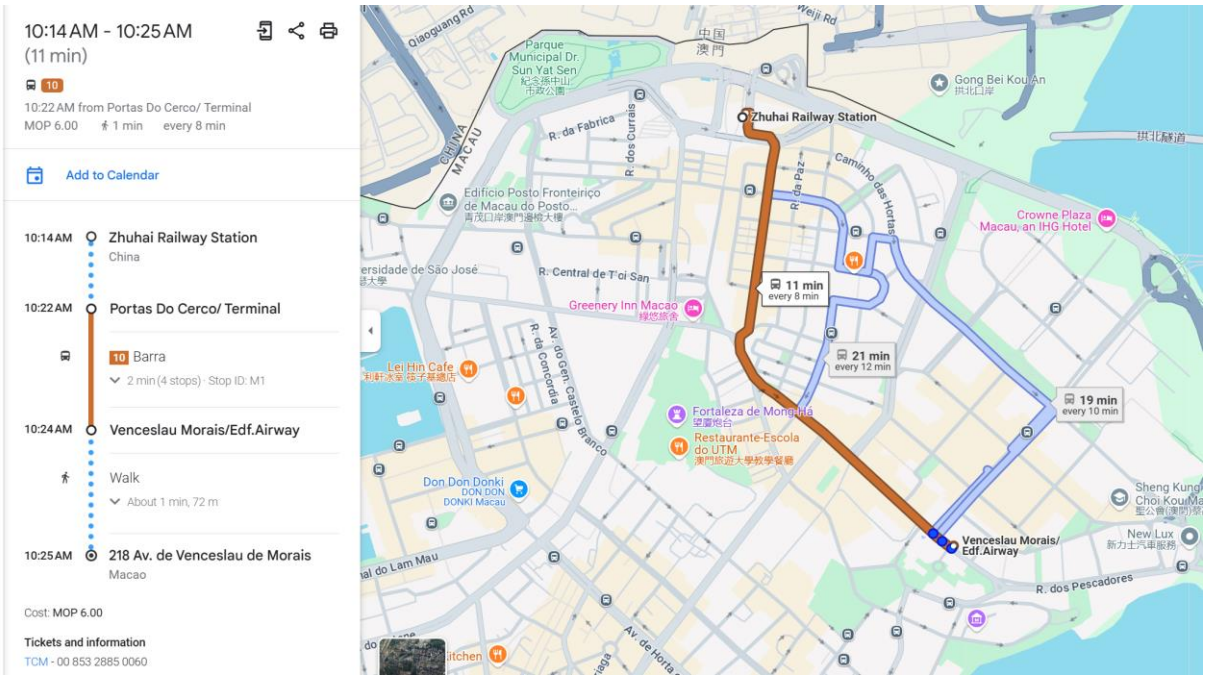


(3) Taxi MOP 75

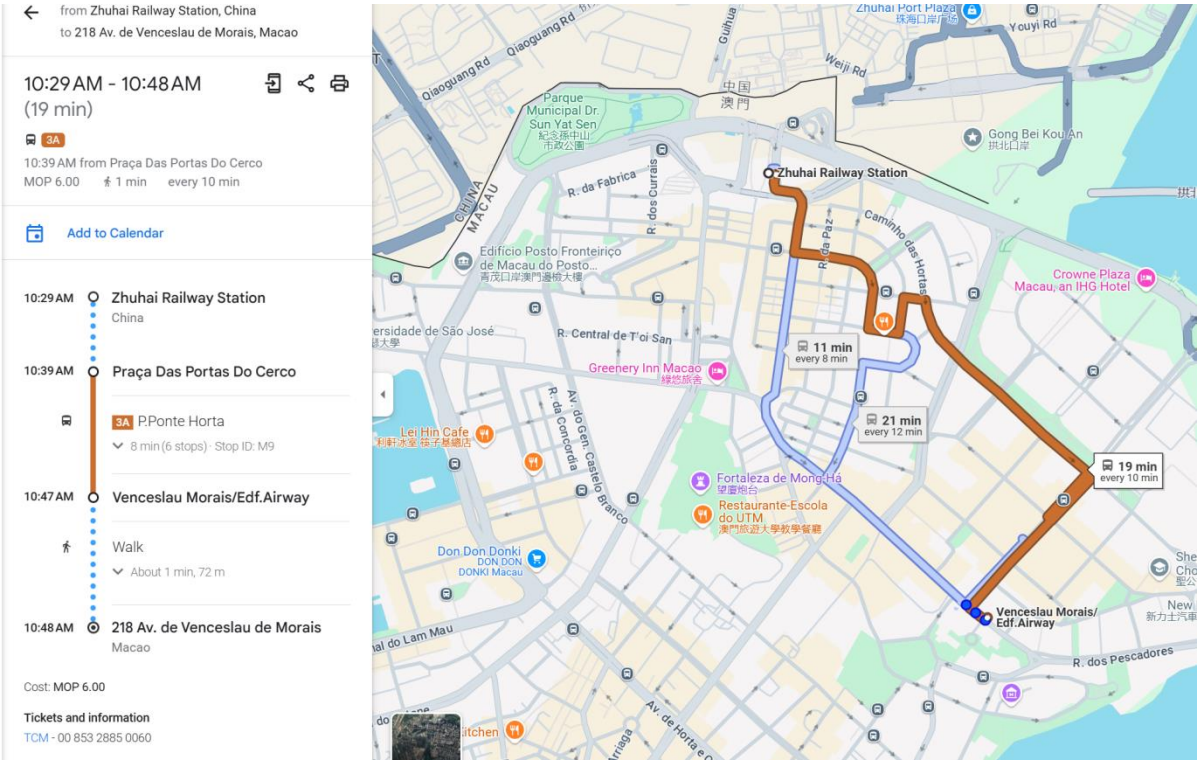


From Zhuhai Railway Station:

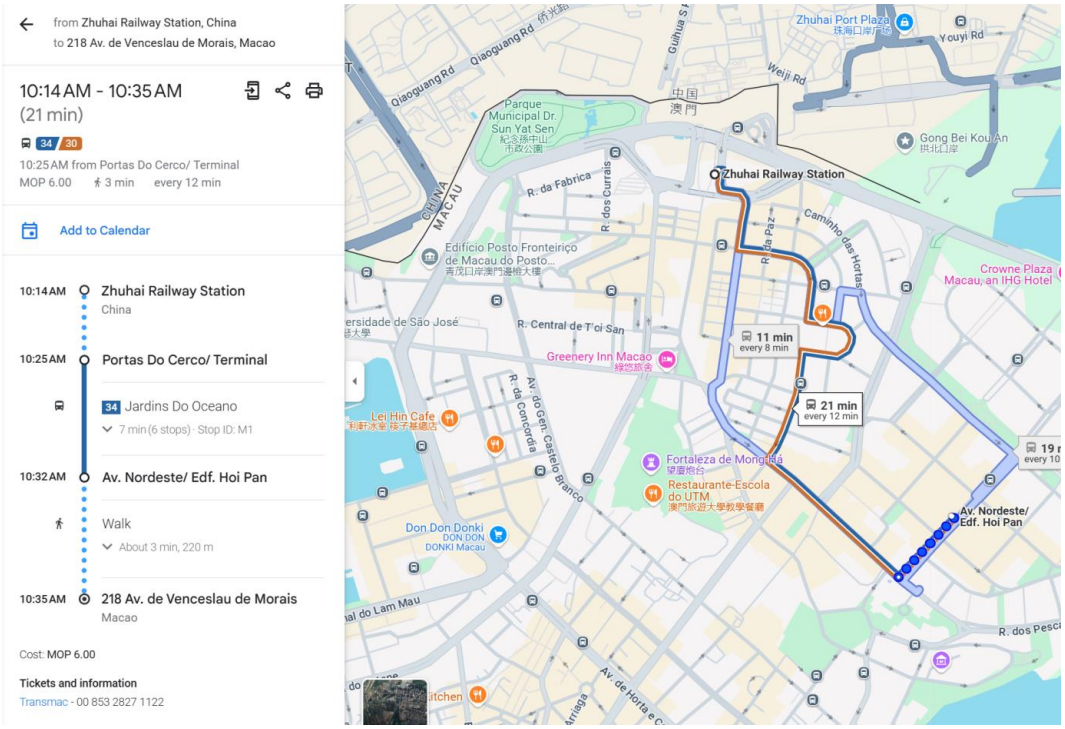
(1) BUS 10 MOP 6



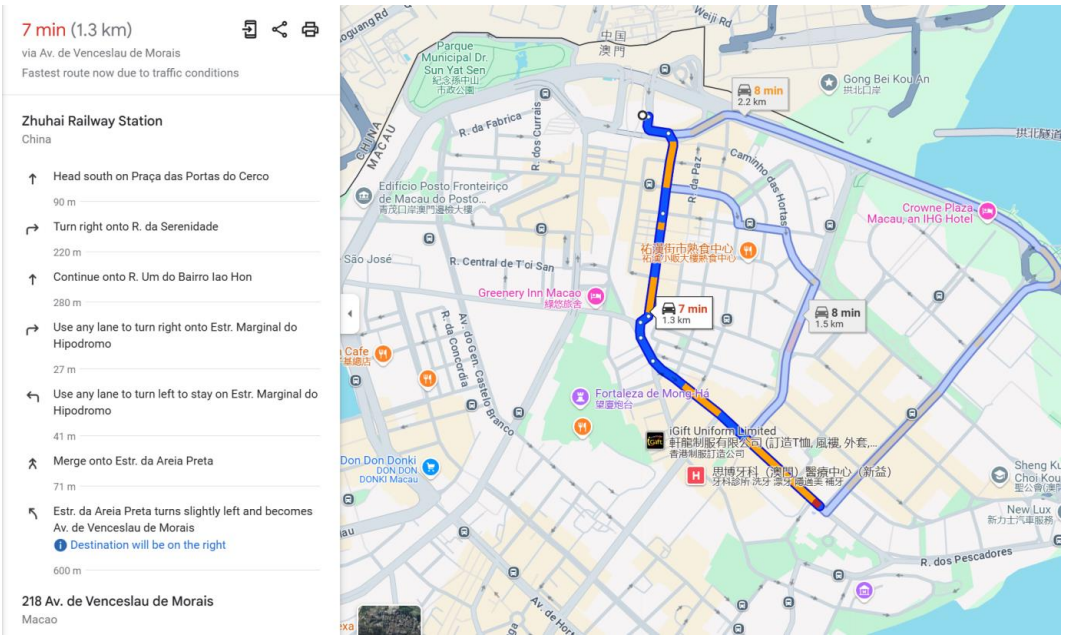
(2) BUS 3A MOP 6



(3) BUS 34 MOP 6



(4) TAXI MOP 20



Notes:

- The guidelines for transportation, please see more details on the website: https://ieir2024.org
- If you have any questions about transportation, please feel free to contact us. (Tongbang Wang, Tel:13699373148, 63769627)

Macau Travel Tips

1. Transportation

In Macau, you can travel by taxi or take public buses. Bus fare is 6 MOP, and you can use Alipay to pay. Follow these steps to use Alipay for bus payment:

- **Step 1:** Open the Alipay app and find the “Transport” option.

- **Step 2**: Activate the Macau bus QR code service by following the steps in the "Transport" section until the "Macau Bus QR Code" appears.

Once activated, your Macau Bus QR Code will be ready for use.

2. Internet Access

Mainland China data plans do not work in Macau. To access the internet, you’ll need to purchase an international data package. Use the "Skytone" (天际通) app to purchase daily data packages with these steps:

- **Step 1:** Open the Skytone app.

- **Step 2:** Select “China Macau.”

- **Step 3:** Choose the daily data package you wish to purchase.

3. Shopping

You can use WeChat or Alipay for purchases in supermarkets, stores, and restaurants in Macau, so there’s no need to exchange MOP beforehand.

4. Charging Devices

Since the voltage and current in Macau differ from those on the Mainland, it’s recommended to bring an adapter for charging devices like mobile phones or laptops. If you forget one, adapters are available at local supermarkets.

5. Regulations

- **Smoking:** Smoking is prohibited in public spaces in Macau, with a fine of **1,500 MOP** for violations (Macau government regulations).
- **Pedestrian Rules:** Most areas in Macau do not have traffic lights (except certain locations). Pedestrians should use designated walkways, as cars yield to pedestrians.

Keynote Speech

Keynote Speaker

Prof. Chunyan MIAO

Professor President's Chair Professor in Computer Science, Associate Vice President; Fellow of Singapore Computer Society (SCS), the Institution of Engineers Singapore (IES) and Academy of Engineering Singapore (SAEng)

Speech Title: Human AI Collective for Future Learning

Abstract: This talk introduces the Human-AI Collective for Future Learning, incorporating goal-based agents, curious agents, and persuasion agents to enhance learning experiences through human-AI collaboration. The framework leverages AI's ability with human like characters such as curiosity, and persuade learners to engage deeply with content. HAI collective creates personalized, adaptive future learning environments.

Biography: Prof. Miao is a renowned expert in Humanized Artificial intelligence (HAI). She has published over 500 research papers and received over 40 research awards, including over 20 Best Paper and top AI conference awards for her impactful AI research in education, health and ageing. The focus of her research has been on HAI that synergizes human intelligence, artificial intelligence and behaviour data analytics for real world applications.

Prof. Miao is Editor of top-tier international journals and Chair of leading conferences, including General Chair of ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD2021), Advisory Committee Chair of IEEE International Conference on Agents, International Conference on Crowd Science and Engineering, International Conference on Ageless Aging (2019 and 2020), and General Chair of 2018 IEEE International 2 Conference on Agents (ICA 2018) etc.

Keynote Speaker

Prof. Sasha Nikolic

President of the Australasian Artificial Intelligence in Engineering Education Centre; Senior Lecturer at the University of Wollongong, Australia

Speech Title: GenAI vs Higher Education Assessments: Understanding the Challenges and Opportunities

Abstract: More than a year has passed since reports of ChatGPT-3.5’s capability to pass exams sent shockwaves through education circles. These initial concerns led to a multi-institutional and multi-disciplinary study to assess the performance of Generative Artificial Intelligence (GenAI) against assessment tasks used across 10 engineering subjects, showcasing the capability of GenAI. Twelve months later, the study was repeated using new and updated tools ChatGPT-4, Copilot, Gemini, SciSpace and Wolfram. The updated study investigated the performance and capability differences, identifying the best tool for each assessment type. The findings show that increased performance and features can only heighten academic integrity concerns. While cheating concerns are central, opportunities to integrate GenAI to enhance teaching and learning are possible. This talk will provide guided examples of the challenges and opportunities academics must consider as integration unfolds.

Biography: Dr Sasha Nikolic is a Senior Lecturer at the University of Wollongong, Australia, and president of the Australasian Artificial Intelligence in Engineering Education Centre. He has a long-standing history with the IEEE, including previously holding positions such as Chair of the IEEE NSW Section, Member of the IEEE Australia Council, and IEEE TALE Steering Committee Member. Dr Nikolic has formed multi-institutional teams to investigate the assessment challenges and integration opportunities of GenAI in higher education. The original GenAI vs Assessment study was recently awarded the best European Journal of Engineering Education paper in 2023 and has amassed over 30,000 views. The follow-up 2024 study is already the 3rd most read paper of all time in the Australasian Journal of Engineering Education. He has been awarded numerous national and international teaching and educational research excellence awards.

Keynote Speaker

Prof. Xinguo YU

Dean of the CCNU Wollongong Joint Institute; Professor at the National Engineering Research Center for E-Learning at CCNU; Adjunct Professor at the University of Wollongong, Australia; Chair of the Hubei Society of Artificial Intelligence in Research and Education

Speech Title: Math Solver Leveraging Synergy of LLMs and Relation Flow Approach

Abstract:

This talk introduces the relation flow approach, highlighting its strong potential and promising results. It then presents the state transform theory, followed by a discussion on how to incorporate historical methods into the relation flow approach to develop superior algorithms. Additionally, the talk explores techniques for integrating newly developed methods to further enhance the solver's capabilities. Finally, it introduces the use of large language models (LLMs) to strengthen relation flow solvers and concludes by envisioning the creation of "mimic solvers" as a foundation for building a "mimic tutor."

Biography:

Prof. Yu plays a pivotal role in advancing AI applications in education. His research expertise spans intelligent educational technology, educational robotics, multimedia analysis, computer vision, and machine learning. With over 200 peer-reviewed publications, he is recognized internationally for his contributions to the field. Prof. Yu is an Associate Editor and Guest Editor for various international journals and has been an influential figure in the global academic community, serving as General Chair, Keynote Speaker, and Program Chair for over 30 international conferences. Since 2021, he has been the driving force behind the annual International Conference on Intelligent Education and Intelligent Research.

Conference Program

	NOVEMBER 6th
14:00 – 18:00	**Registration, Device & Connection Test** Main Hall
	NOVEMBER 7th
9:00 – 9:10	**Opening Ceremony** Host: Longkai Wu Main Hall
9:10 – 10:00	**Keynote Speech** **Title: Human AI Collective for Future Learning** Prof. Chunyan Miao Host: Xinguo Yu Main Hall
10:00 – 10:25	**Take Group Photo & Tea Break** Main Hall
10:25 – 11:55	**Session 1: Best Paper Session** Host: Longkai Wu; Lei Niu Conference Hall 1
	Title
10:25 – 10:40	**Unified Knowledge Tracing Framework for Subjective and Objective Assessments** Zhifeng Wang; Jiaqin Wan; Yang Yang; Chunyan Zeng; Jialiang Shen
10:40 – 10:55	**Integrating Educational Assessment and Generative AI for Personalized Knowledge Building: An Exploratory Study** Wenbin Gan; Yuan Sun; Xinguo Yu
10:55 – 11:10	**Improvement of AI-Driven Deep Knowledge Tracing Algorithms** Yan Li; Wai Yie Leong

11:10 – 11:25	**AI in Education for Corporate Training** Kuchhal Shourya; Zhiqi Shen	
11:25 – 11:40	**Framework Design of a Multi-Educational-Agent System for University Lecturers** Kai Yang; Lei Niu	
11:40 – 11:55	**Integrating Question Proficiency Level and Historical Knowledge States for Knowledge Tracing** Yiyang Zhao; Xinzi Peng; Jinzheng Liu; Ting Zhang	
12:00 – 14:00	**Lunch** Main Hall	
14:00 – 14:50	**Keynote Speech (Main Hall)** **Title: GenAI vs Higher Education Assessments: Understanding the Challenges and Opportunities** Prof. Sasha Nikolic Host: Hon Wai Leong	
14:50 – 16:20	**Session 2** Topic: AI for Research Host: Hon Wai Leong; Hao Wu Conference Hall 1	**Session 3** Topic: Technology Influence to Education Host: Xiaoshu Xu; Tongbang Wang Conference Hall 2
	Title	**Title**
14:50 – 15:05	**Artificial Intelligence for Research (AI4R): Knowledge Base and Impact** Xinguo Yu; Jing Xia; Zhiqi Shen	**The Impact of AIGC on Modern Education: Transforming Learning and Teaching Methods** Yiduo Cheng; Tongbang Wang
15:05 – 15:20	**AI-Empowered Human Research Integrating Brain Science and Social Sciences Insights** Feng Xiong; Xinguo Yu; Hon Wai Leong	**Research on the Evolution of Public Sentiment and the Implementation Strategy of the "Double Reduction" Policy** Feng Chen; Xialin Shen; Weiwei Sun; Xinguo Yu
15:20 – 15:35	**The Importance of Modular Structure in Artificial Intelligence Algorithm Evaluation** Hao Wu; Xinguo Yu	**The Impact of Teacher Participation in Online English Forums on Middle School Students' Intercultural Communicative Competence** Yan Yue; Rong Zheng; Xiaoshu Xu; Ngan Lin Vivian Lei; Jie Weng

15:35 – 15:50	**Critical Review of AI-Driven Human Research Intelligence: Integrating 3C Theory of Cognition, Emotion, and Thinking in Human-AI Interaction** Feng Xiong; Xinguo Yu; Hon Wai Leong	**Emotion-Driven AI Collaboration and Multimodal Learning in Vocational Education** Hongli Zhang; Wai Yie Leong; Yan Li *(Online Presentation)*
15:50 – 16:05	**Trends in Geographic Information Science Discipline in The Era of Artificial Intelligence and Big Data** Jihao Wu; Feng Xiong; Wenyan Lu; Youxin Jiang; Lianyu Huang *(Online Presentation)*	**Exploring the Factors Influencing of Teachers' Acceptance of Artificial Intelligence in Higher Education English Teaching** Yuxi Luo; Wai Yie Leong *(Online Presentation)*
16:05 – 16:20	**A Review of Taxonomy Expansion And its Applications in AI Empowering Research** Yukang Lu; Kun Jiang; Zilin Zhang *(Online Presentation)*	**Impact of Generative AI in Revolutionizing Education** Shayan Aamir; Shafaq Fatima Mughal; Muhammad Zain Yousuf; Omar Ali Rastgar; Ayesha Asif Syed; Aeyaz Jamil Kayani *(Online Presentation)*
16:20 – 16:30	**Tea break** Main Hall	
16:30 – 18:00	**Session 4** Topic: Developing Solvers Host: Chao Sun; Hao Ming Conference Hall 1	**Session 5** Topic: Developing Educational Technologies and Systems Host: Bin He Conference Hall 2
	Title	**Title**
16:30 – 16:45	**A Review on Relation-Flow Approach in Problem Solving** Xinguo Yu; Jing Xia; Zihan Feng; Zhiqi Shen	**Optimising Incidental Vocabulary Learning in Intelligent Education: Exploring the Interplay of Task Type, Language Proficiency, and Semantic Elaboration** Qiang Wang; Jun Wang; Wenjuan MA; Ngan-Lin Lei Vivian; Xiaoshu Xu

16:45 – 17:00	**Multi-Knowledge Distillation for Constructing Math Word Problem Encoder** Xiaotian Cheng; Hao Ming; Zhenquan Shen; Xinguo Yu	**Research on Multimodal Knowledge Points Segmentation Tool for Classroom Teaching Videos** Jing Wang; Jiarong Yi; Gang Zhao; Yinan Zhang; Chao Yu; Fengying Dai
17:00 – 17:15	**An Enhanced Relation-flow Algorithm for Solving Number Line Problems** Jinghao Dou; Xiaopan Lyu; Xinguo Yu; Hao Wu	**An Intelligent Querying System for Educational Statistics Using Pre-trained and Large Language Models** Bin He; Bing Yu; Longfei Song; Zhen Liu; Shennan Chen; Qifang Liu
17:15 – 17:30	**Data Augmentation with Large Language Models for Math Word Problem Solving** Huikai Gao; Chao Sun	**Designing a LLM-driven Avatar System to Enhance Social Skills for Autistic Children in DTT Learning** Yihe Zhu; Liang Guo; Jiashu Sun; Xiaojun Hei
17:30 – 17:45	**A Study of Automatic Solver for Math Word Problems based on RoBERTa and SW-MSA** Tianhao Sun; Yanli Wang; Pengpeng Jian; Bin Ma *(Online Presentation)*	**Enhancing Large Language Models for Precise Classification of Teacher Praise Discourse: A Fine-Tuning Approach** Zengzhao Chen; Lu Gao; Zhifeng Wang; Debo Ren; Tonglian Yang; Yawen Shi *(Online Presentation)*
17:45– 18:00	**Performance Analysis of Chinese Large Language Models in Solving Math Word Problems** Shilian Pan; Kai Liu; Wenjun Chen; Bin He *(Online Presentation)*	**Exploring the Usage of Token Economy and Peer Review to Select Lab Assistants and Tutors for Computer Science Courses** Kun Tian; Wen Liu; Xiang Li; Ying He; Yan Tang; Richard C Tillquist *(Online Presentation)*

	NOVEMBER 8th	
8:00 – 8:50	**Keynote Speech** **Title: Math Solvers of Leveraging Synergy of LLMs and Relation-Flow Approach** Prof. Xinguo Yu Host: Chandana Withana Main Hall	
8:50 – 10:20	**Session 6** Topic: Knowledge Tracing Host: Zhifeng Wang; Ting Zhang Conference Hall 1	**Session 7** Topic: Learning Environment Host: Wai Yie Leong Conference Hall 2
	Title	**Title**
8:50 – 9:05	**Enhanced Graph-Based Model with Mathematical Knowledge Embedding for Math Word Problem Solving** Xin He; Chao Sun	**Anxious Depression Agents Leverage Neuroimages in Human-Robot Interactions** Yihang Cheng; Hao Meng; Wei Zhang
9:05 – 9:20	**A Pilot Study on Detecting Cognitive Load Using Kolmogorov-Arnold Networks with EEG Signals** Guangshuai Wang; Tengfei Gao; Zhiyi Yang; Kai Zhang; Jingying Chen; Dan Chen	**Computational Thinking in Asia-Pacific K-12 STEAM Education: A Systematic Review** Tan Qian; Sdenka Zobeida Salas-Pilco
9:20 – 9:35	**RoBERTa-based Multimodal Sentiment Analysis of Detecting Teachers' Emotions** Nuo Lei; Hao Meng; Xingpeng Jiang	**Collaborative Learning Environments by Educational Agent Feedback Systems** Xin Qi; Hao Meng; Xinguo Yu
9:35 – 9:50	**Cross-Disciplinary Cognitive Diagnosis Leveraging Deep Transfer Learning for Smart Education** Zhifeng Wang; Meixin Su; Yang Yang; Chunyan Zeng; Lizhi Ye	**Integrating Artificial Intelligence into Whole-Person Education for a New Paradigm in Engineering Education** NaiXin Zhang; Wai Yie Leong *(Online Presentation)*

9:50 – 10:05	**Personalized Art Image Generation Model for Smart Art Education** Di Chen; Xinyue Xu; Zhifeng Wang; Jialiang Shen *(Online Presentation)*	**Predicting Dropout on MOOCs via Characterizing Personalized Learning Ability and Course Difficulty** Guiqiang Luo; Gan Wang; Weizhong Zhao; Xingpeng Jiang; Tingting He *(Online Presentation)*
10:05 – 10:20	**A Game-Theoretic Analysis of AI Integration in Education** Jinhua Zhao; Rui Ding *(Online Presentation)*	**A Learning Style-aware Dropout Prediction Method via Fusing Global and Local Semantics** Guiqiang Luo; Weizhong Zhao; Xingpeng Jiang; Tingting He *(Online Presentation)*
10:20 – 10:35	**Tea Break** Main Hall	
10:35 – 11:50	**Session 8** Topic: AIGC and Courses Host: Li Qian ; Cuilian Zhang Conference Hall 1	**Session 9** Topic: Technology Application and Evaluation Host: Chandana Withana; Feng Xiong Conference Hall 2
	Title	**Title**
10:35 – 10:50	**The Effect of Generative Artificial Intelligence on Students'Academic Achievement: A Meta-analysis** Li Qian; Wenhao Li; Qinna Feng; Liangya Li	**Evaluating Automated Geometric Problem Solving with Formal Language Generation on Large Multi-modal Models** Motian Zhou; Chen Wu; Chao Sun
10:50 – 11:05	**A Review of AI-based Techniques in Online Course Recommendation: Metrics, Factors, and Research Methods** Cuilian Zhang; Xiao Hu; Wei Wei	**Applying Concept of IOT in Education Environment to Increase Smart Learning Quality Education: Review Paper** Manila shahi; Chandana Withana; Anusha Dissanayake; Indra Seher *(Online Presentation)*
11:05 – 11:20	**How LLMs Support EFL Writing: A Case Study of K-12 English Learning Based on the EDIPT Model** Yi Dai; Qianhui Panghe; Yunfeng Zhang; Ming Zhang; Xiaoshu Xu	**Artificial Intelligence (AI) in Cybersecurity and Inhibitors to AI Adoption** Richard Barton; Chandana Withana; Amr Elchouemi; Israel Fianyi *(Online Presentation)*

11:20 – 11:35	**Exploration of Computer Aided Education: Development and Application of Digital Course Resources Based on FEM** Yajuan Zhang; Caiying Qiao; Yibing Fan; Pengshihan Bai *(Online Presentation)*	**Application of Artificial Intelligence and UAV Remote Sensing in Regional Vegetation Environment Information Extraction** Jihao Wu; Hui Wang; Wenyan Lu; Youxin Jiang; Feng Xiong *(Online Presentation)*
11:35 – 11:50	**Dynamic Evolution Analysis of AI in Education Based on SciMAT** Huan Liu; Linchao Huang; Shuoyuan Xu; Feng Zhang; Ge Han; Wenxing Luo *(Online Presentation)*	**A review of Machine learning-based Trojan detection techniques for securing IoT edge devices** Hamza Safdar; Chandana Withana; Emadeldin Elgamal; Indra Seher *(Online Presentation)*
12:00 – 14:00	**Lunch** Main Hall	
14:00 – 18:05	**Session 10: Invited Talks** Main Hall Host: Jingying Chen	
	Title	**Speaker**
14:00 – 14:35	**Artificial Intelligence Empowering Higher Education: New Opportunities and Trends**	Longkai Wu
14:35 – 15:10	**Educational and Psychological Cues Supported Interpretable Knowledge Tracing for Personalized E-Learning**	Zhifeng Wang
15:10 – 15:45	**History of AI and its impact on education and research**	Hon Wai Leong
15:45 – 16:20	**Personalized Intelligent Intervention for Children with Autism Spectrum Disorder**	Jingying Chen
16:20 – 16:55	**Revolutionizing Education in the AI Era: Preparing for an Uncharted Future**	Xiaoshu Xu
16:55 – 17:30	**Educational Assessment and Generative-AI for Adaptive Learning**	Wenbin Gan
17:30 – 18:05	**Multimodal Data-Driven SaaS Platform for Youth Sports Education**	Xiao Zhang (Online)