IEIR

WUHAN 2023

IEEE

Advancing Technology for Humanity

Conference Program

IEIR 2023

International Conference on Intelligent Education and Intelligent Research

华中师范大学

CENTRAL CHINA NORMAL UNIVERSITY

1903 - 2023

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

UNIVERSITY OF WOLLONGONG AUSTRALIA

湖北省智能科教研究会

Hubei Society of Artificial Intelligence for Research and Education

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Guidance to Attend IEIR2023

- IEIR 2023 will be held from November 5th to 7th, 2023 on the campus of Central China Normal University (CCNU), Wuhan, China.
- There is also a synchronous virtual online meeting and the online Zoom meeting information are as follow: **Zoom meeting ID：2120343030　　Password：457237**
- Each Oral presentation, **10 minutes for presentation and 5 minutes for Q&A.**
- Posters are required to be printed by author and displayed at the conference, please see details for poster production instructions on the website: **https://www.ieir2023.org/posters.html**
- **Please note that all accepted papers must meet the camera-ready requirements and must give an on-site oral or poster presentation as required before they can be published.**

Join WeChat Group for IEIR2023

- WeChat Group for IEIR2023 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 IEIR2023 website.
- Best paper and best student paper will be announced at the banquet.

The QR code of the WeChat Group

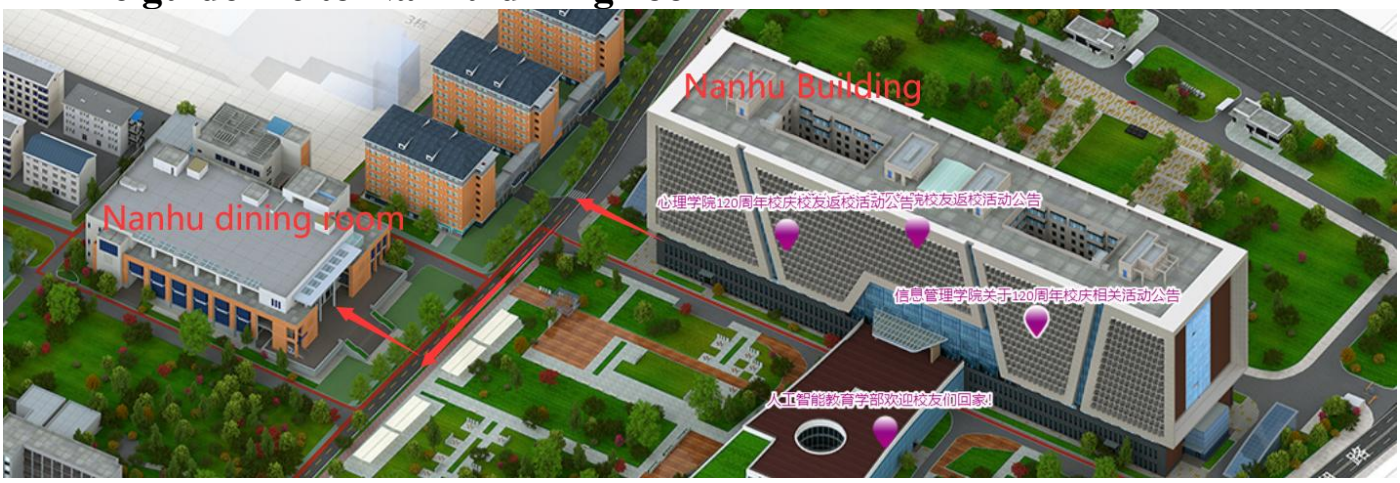
群聊: IEEE IEIR 2023 Participants

该二维码7天内(11月8日前)有效，重新进入将更

Conference Venue

- **Lecture Hall on the 1st floor of Nanhu Building, Nanhu Campus, Central China Normal University**

- **The guideline to Nanhu dining room**



Notes:

- Registration at the hall on the 1st floor of Nanhu Building, Nanhu Campus, Central China Normal University
- When heading to the banquet, the buses are arranged to take us to Guixiangyuan Ballroom.
- The guidelines for transportation, please see more details on the website: https://www.ieir2023.org/conference_ts.html
- Participants can enter the campus of Central China Normal University with the electronic or paper version of the invitation letter. The invitation letter can be download from: https://www.ieir2023.org/download/Invitation_Letter.pdf

- Participants who drive by car can only enter and exit the main campus through the north gate (near Luoyu Road), and enter and exit the Nanhu campus through the east gate (near Guihu Road).

Conference Agenda

5 November	Registration	
14:00 – 18:00	**Registration, Device & Connection Test**	
6 November		**Host**
8:30 – 8:50	**Opening Ceremony**	Lei Niu
8:50 – 9:40	**Keynote** Title: Computational intelligence enabled OER ecosystem in the Web 3 era Prof. Jun Shen	Xinguo Yu
9:40 – 10:00	**Take a group photo & Tea break**	
10:00 – 12:00	**Session 1** Oral presentation of 8 papers Topic: AI empowering education	Ting Zhang
12:00 – 14:00	Lunch (Buffet) on the 3rd floor of Nanhu dining room	
14:00 – 14:50	**Keynote** Title: History of AI and its impact on education and research Prof. Hon Wai Leong	Xinguo Yu
14:50 – 16:20	**Session 2** Oral presentation of 6 papers Topic: AI empowering education	Zhifeng Wang
16:20 – 16:30	**Tea break**	
16:30 – 18:00	**Session 3** Oral presentation of 6 papers Topic: Applications in education	Jinhua Zhao
18:00 – 20:00	**Dinner (Banquet) on the 3rd floor of Guixiangyuan Ballroom** **Best paper will be announced at the banquet**	Lei Niu
7 November		
8:00 – 8:50	**Keynote** Title: End-to-Cloud Collaborative Visual Localization and 3D Reconstruction with Applications in Mixed Reality Prof. Guofeng Zhang	Xinguo Yu
8:50 – 10:20	**Session 4** Oral presentation of 6 papers Topic: Applications in education	Guangshuai Wang
10:20 – 10:30	**Tea break**	
10:30 – 12:00	**Session 5** Oral presentation of 5 papers Topic: AI for research	Heng Luo
12:00 – 14:00	Lunch (Buffet) on the 3rd floor of Nanhu dining room	
14:00 – 15:30	**Session 6** Oral presentation of 6 papers Topic: Applications in education	Anwar Ullah
15:30 – 15:40	**Tea break**	
15:40 – 17:40	**Session 7** Invited talks	Xinguo Yu
17:40 -18:00	Closing ceremony	Lei Niu
18:00 – 19:00	Dinner (Buffet) on the 3rd floor of Nanhu dining room	

Keynote Speech

Keynote Speaker

Prof. Jun Shen

Professor of Faculty of Engineering and Information Sciences, School of Computing and Information Technology, University of Wollongong, Australia

Speech Title: Computational intelligence enabled OER ecosystem in the Web 3 era

Abstract: Open educational resources have been talked for many years, but there is controversy how sustainable it could be. Some earlier efforts proposed to develop computational intelligence enabled micro learning, knowledge extraction and other solutions, but they cannot solve the problem of the underlying cost model. This talk introduces a new framework to leveraging some Web 3 economical concepts to build a novel ecosystem supporting future OER development.

Biography: Prof Jun Shen got his PhD at Southeast University then worked at Australian universities. He is a full professor at University of Wollongong and has established expertise in multi-domain computational intelligence applications, including education, transport, manufacturing and bioinformatics. He was a visiting professor at MIT and GaTech, and is an associate editor of 4 Tier 1 international journals and editorial members of other 8 journals. He has published more than 300 papers in relevant fields including IEEE TLT, IEEE TSC, BIB, ICML, KDD, BJET etc. He is senior member of ACM and IEEE, and was panel member of ACM/AIS MSIS2016 and also PC chair or member for more than 400 international conferences.

Keynote Speaker

Prof. Hon Wai Leong

Associate Professor of Dept of Computer Science, National University of Singapore, Singapore

Speech Title: History of AI and its impact on education and research

Abstract: The explosive growth and advances in artificial intelligence and data analytics over the past decade has caused big waves in education and education research. In this talk, I will present some historical perspective, some of the recent changes (including some personal examples), and talk about the changes that are coming in the future.

Biography: Prof. Hon Wai Leong is with the Department of Computer Science at the National University of Singapore. He received the B.Sc. (Hon) degree in Mathematics from the University of Malaya and the Ph.D. degree in Computer Science from the University of Illinois at Urbana-Champaign. He also had visiting appointments at UIUC, UCSD, and also in Shanghai Institute of Biological Sciences, CAS. His research interest is in the design and analysis of algorithms for optimization problems from diverse application domains including VLSI-CAD, transportation logistics, multimedia systems, and computational biology. As a teacher, he specializes in finding simple ways to explain complicated subject matters and loves to integrate CT (computational thinking) and growth mindset in his classes. Recently, he was involved in teaching two innovative courses: "GEQ1000: Asking Questions", and "GET1031: Computational Thinking (no coding)". Both courses are general education courses for all students (esp for non-majors). He is passionate about fostering the love for Computing and Mathematics to all, and especially to young students. He works with high school students and teachers via outreach talks and fun workshops on creative problem solving, CT, matheMAGIC. He also mentors high school students' research projects. He gives general talks on "Computational Thinking (CT) for anyone and everyone", especially to teachers and parents. In 1992, he founded the Singapore training program for the International Olympiad in Informatics (IOI). In 2008, he (together with others) started an annual coding competition for primary school students (code::XtremeApps competition: Junior category). He is also an advisor to a coding academy, LccL (Learn to Code and Code to Learn) meant for children from 5 to 18. He is a member of ACM, IEEE, ISCB, and a Fellow of the Singapore Computer Society.

Keynote Speaker

Prof. Guofeng Zhang

Professor and Doctoral Supervisor of the State Key Laboratory of CAD&CG, Zhejiang University, China

Speech Title: End-to-Cloud Collaborative Visual Localization and 3D Reconstruction with Applications in Mixed Reality

Abstract:

Visual tracking, localization, and 3D reconstruction are classic problems in the field of computer vision. They have broad applications in AR/VR/MR, robotics, autonomous driving, etc. Due to the complexity of real environments, these techniques often face some critical challenges when applied practically. For example, how can mobile devices achieve real-time stable registration and accurate relocalization in large-scale complex scenarios? How to efficiently eliminate error accumulation through global optimization? How to realize efficient high-precision 3D reconstruction for large-scale scenes? This report addressing these key issues as well as introducing a mixed reality platform based on end-cloud collaboration developed by our team. We also demonstrate its applications in mixed reality.

Biography:

Guofeng Zhang, professor and doctoral supervisor of the State Key Laboratory of CAD&CG, Zhejiang University. He was funded by the National Science Fund for Outstanding Young Scholars. He is mainly engaged in the research of 3D vision and augmented reality, especially in SLAM and 3D reconstruction. He has made a series of important achievements, developed a series of related softwares (http://www.zjucvg.net), and open source a series of SfM/SLAM systems or key module algorithms (https://github.com/zju3dv/). He is one of the main initiators behind OpenXRLab, an extended reality open-source platform accessible here: https://openxrlab.org.cn/. He has won the National Outstanding Doctoral Dissertation Award, the Computer Society Outstanding Doctoral Dissertation Award, the first prize of the Science and Technology Progress Award of the Ministry of Education's Higher Education Scientific Research Outstanding Achievement Award (ranked 4th), the first prize of the Zhejiang Province Natural Science Award (ranked 2th), the first prize of Zhejiang Province Technology Invention Award (ranked 4th), and the only best paper award in ISMAR 2020 which is the top international conference in the field of mixed reality and augmented reality. He is currently the editorial board member of "Virtual Reality & Intelligent Hardware" and "Journal of Applied Science", the youth editorial board member of "Chinese Journal of Image and Graphics", the deputy director of the 3D Vision Professional Committee of the China Society of Image and Graphics, and the Augmented Reality Chapter of Zhejiang Artificial Intelligence Society. He served as the general chair of VALSE 2022, the program co-chair of VALSE 2019 & 2021 and ChinaVR 2021, the area chair of CVPR 2021 & 2023, program committee member of ISMAR 2019-2023 and IEEE VR 2021-2023.

Oral Paper Sessions

Keynote 8:50-9:40 6 November	**Title: Computational intelligence enabled OER ecosystem in the Web 3 era** **Prof. Jun Shen**
9:40-10:00	**Take a group photo & Tea break**
Session 1 10:00 – 12:00 6 November ***Chair: Ting Zhang*** ***Zoom：2120343030 Password：457237***	**Topic: AI empowering education** • **54** Visual-Semantic Refinement Network: Towards Exploring the Capabilities of Decoder in Scene Text Recognition——Yingtao Tan*; Yingying Chen; Jinqiao Wang • **34** The geometric neural solution combined with text diagram parsing——Cong Pan*; Pengpeng Jian • **32** Visual Amplification of Geometry Problems: A Method for Synchronized Highlighting in Text and Diagrams——Litian Huang*; Xinguo Yu; Rao Peng • **60** Robot intervention in social skills of children with autism: a review of the latest three years——Kun Zhang*; Yuanxu Jin; Jingying Chen; Yating Dai; Ying Zhang • **76** An Experimental Study of Unsupervised Rank Aggregation Methods in World University Rankings——ShiWei Feng*; Qi Deng; SiYi Wang; Lin Song; Chao Liang • **49** A statistical framework for measuring the efficacy of Peer Review on Students' Performance——Abbas Attarwala*; Kun Tian (Online) • **7** Research Personalized Learning Report Generation — An Example from a Course on Integration of Information Technology and Physics Curriculum——Wu Yanwen; Han Yuan*; Shao Fenghua; Guo Ziyu (Online) • **62** Cross-lagged analysis of exam anxiety, state anxiety, trait anxiety, and test scores among ninth grade students——Ke Zhang*; Xuebing Li (Online)

Keynote ***14:00 – 14:50*** ***6 November***	**Title: History of AI and its impact on education and research** **Prof. Hon Wai Leong**
Session 2 ***14:50 – 16:20*** ***6 November*** ***Chair: Zhifeng Wang*** ***Zoom：2120343030*** ***Password：457237***	**Topic: AI empowering education** • **21** Enhanced Convolutional Neural Networks Based Learner Authentication for Personalized E-learning System——Zhifeng Wang*; Minghui Wang; Chunyan Zeng; Jialong Yao; Yang Yang; Hongmin Xu • **20** Knowledge guidance combined with end-to-end method to solve math word problem without implicit knowledge——Jiaxing He*; Chao Sun • **25** The effect of different instructional video formats on mental fatigue in the learning process — brain functional network analysis——Chen M Fen* (Online) • **58** Adoption of Teaching Strategies Leveraging on Virtual and Augmented Reality in Higher Education in Less Developing Countries: A Case of BURUNDI——Sabiteka Micheline*; Xinguo Yu; Chao Sun • **33** Mining the relationship between teacher behavior, eye-gaze and gesture in classroom teaching: a multi-dimension analysis approach——Gang Zhao; Jie Chu; Wenjuan Zhu*; Jing Wang; Qing Xia
16:20 – 16:30	***Tea break***
Session 3 ***16:30 – 18:00*** ***6 November*** ***Chair: Jinhua Zhao*** ***Zoom：2120343030*** ***Password：457237***	**Topic: Applications in education** • **81** A Machine Solving Method for Math Word Problem via Enhanced Semantic Representation——Ming Yan*; Pengpeng Jian; Yanli Wang; Haoyang Xie • **74** Evaluation of Large Scale Language Models on Solving Math Word Problems with Difficulty Grading——Xin He* • **8** AI empowered quantitative evaluation method for handwritten Chinese character——Jiangbo Shu; Chuang Zhu*; Shanfei Shi; Wan Ma; Jianran Li; Shuaicheng Lu • **50** Live Coding in the Classroom: Evaluating Its Impact on Student Performance through ANOVA and ANCOVA——Abbas Attarwala*(Online) • **51** Extending the Relative Approach toward Teaching Effectiveness for Studying and Predicting Educational Equity Gaps——Kun Tian *; Abbas Attarwala; Ying He; Wen Liu(Online)

Keynote ***8:00 – 8:50*** ***7 November***	**Title: End-to-Cloud Collaborative Visual Localization and 3D Reconstruction with Applications in Mixed Reality** **Prof. Guofeng Zhang**
Session 4 ***8:50 – 10:20*** ***7 November*** ***Chair:*** ***Guangshuai Wang*** ***Zoom：2120343030*** ***Password：457237***	**Topic: Applications in education** • **12** Robots as Recipients: The Effect of Familiarity on Children's Sharing Behavior in Children-Robot Interactions ——Zihui Li*; Siyi Liu; Yi Pang • **66** Computer Game-based Social Skill Intervention for Children with Autism Spectrum Disorder——Guang-Shuai Wang; Junlin Hu; Shiying Zheng; Kun Zhang* • **36** Research on Global Education Artificial Intelligence Hotspots from the Perspective of Knowledge Graph——Yujiao Li; Liu Huan; Wenxing Luo* • **63** A Generative AI-based Teaching Material System Using a Human-In-The-Loop Model——Shengnan Chen*; Qifang Liu; Bin He • **71** A Deep Understanding Video Q&A System for Film Education in Acting Department——ZhengQian Wu; Ruizhe Li; Jiahao Guo; Zhongyuan Wang; Chao Liang* • **43** Landscape and Trends in the Application of Artificial Intelligence in Medical Education——Feng Chen*; Jing Xia; Xinguo Yu; Jing Zhuge (Online)
10:20 – 10:30	***Tea break***
Session 5 ***10:30 – 12:00*** ***7 November*** ***Chair: Heng Luo*** ***Zoom：2120343030*** ***Password：457237***	• **Topic: AI for research** • **31** Is metaverse better than video conferencing in promoting social presence and learning engagement?——Yan Zhang*; Heng Luo; Yonggui Liu; Wei Cheng • **64** A Teacher and Student Expression Recognition Model Based on Classroom Teaching Videos——Ziyi Liu* • **44** Mining Topic Structure of AI Algorithmic Literature——Hengyi Miao*; Xinguo Yu; Hao Wu • **26** Algorithm Skeleton Mining Based on Optimized Pre-training Mechanisms in Survey Paper——Liang Xue*; Hao Meng; Xinguo Yu • **46** A Personalized Intelligent Tutoring System for Mathematics Homework——Xuebi Xu*; Chao Sun; Xinguo Yu • **61** Review of research on synonym equivalence relation mining——Zilin Zhang*

Session 6 ***14:00 – 15:30*** ***7 November*** ***Chair: Anwar Ullah*** ***Zoom：2120343030*** ***Password：457237***	**Topic: Applications in education** • **18** Construction and management of experimental platform with virtual integrated real equipment for electronics or information specialized subject——Shengye Huang* (Online) • **59** Development of a Web-Based Student Portal System for University Students——Khalid Wahab; Anwar Ullah*; Yulin Wang; Abdul Majid • **3** Investigating Silence in Online EFL Classes Among University Students in China——Yuhua Deng*; Paramaswari Jaganathan (Online) • **56** Robust Batch Relation Preserving for Lifelong Unsupervised Domain Adaptation——Jinghan He*; Haiyun Guo; Ming Tang; Jinqiao Wang • **9** Automatic Knowledge Graph Construction over Efficient Information Extraction Networks——Fanyang Bu*; Yujue Wang; Yinqiao Li; Yuan Sui
15:30 – 15:40	**Tea break**
Session 7 ***15:40 – 17:40*** ***7 November*** ***Chair: Xinguo Yu*** ***Zoom：2120343030*** ***Password：457237***	**Invited Talk** --- ❖ **Title:** Video Case Retrieval and Deep Understanding Technology Evaluation ❖ **Reporter:** Dr. Liang Chao, Associate Professor at the School of Computer Science, Wuhan University --- ❖ **Title:** AI in Education: Harmonizing Societal Shifts and Individual Aspirations ❖ **Reporter:** Dr. Xiaoshu, Xu, Wenzhou University, --- ❖ **Title:** Educational Assessment for Adaptive Learning ❖ **Reporter:** Dr. Wenbin Gan, Researcher at the Big Data Integration Research Center, National Institute of Information and Communications Technology (NICT) in Tokyo, Japan. --- ❖ **Title:** AGV service robot form design to BAS metaheuristic algorithm implication ❖ **Reporter:** Ata Jahangir Moshayedi, School of Information Engineering, Jiangxi University of Science and Technology

Poster Papers

Poster Papers Chair: Hao Wu
Address: Lecture Hall on the 1st floor of Nanhu Building

- **55** Scientific Paper Classification by Fusing BERT and GCN ——Xiaohe Zhang; Xinguo Yu; Xiaoqian Liu*; Xiaopan Lyu
- **48** Innovation Points Mining from Scientific Papers with Deep Learning Models——Xinguo Yu; Benyi Xie; Xiaopan Lyu*
- **42** Ongraph Vector Computing for Solving Explicit Arithmetic Word Problems——Xiaopan Lyu*; Ruolan Huang; Xinguo Yu
- **19** The Problem Difficulty Impact On Machine Solving Of Math Word Problems——Jiaxing He*; Chao Sun
- **23** A Mathematical Concepts Enhanced Annotation Model for Chinese Arithmetic Word Problems——Xiaopan Lyu*; Xiaoqian Liu; Rao Peng; Chuanzhi Yang; Xinguo Yu
- **45** Geometry Arithmetic Problem Recommendation Based on Scene-Enhanced BERT——Yixing Min*; Rao Peng; Litian Huang; Xiaopan Lyu ; Xinguo Yu
- **52** Prompt Incorporates Math Knowledge to Improve Efficiency and Quality of Large Language Models to Translate Math Word Problems——Hao Wu*; Xinguo Yu
- **38** Understanding Individual Differences in Reading Chinese Traditional Poetry Using Hidden Markov Models——Feng Xiong *; Anran Ma ; Xiaoxue Leng
- **72** Why technology-supported classrooms: An analysis of classroom behavior data from AIGC——Yi Dai; Yizhe Huang; Xiaoshu Xu*; Yunfeng Zhang
- **68** The framework design of an intelligent task assignment system for team collaboration——Jinhan Li; Lei Niu*
- **57** Embedding Coordinates in Transformer for Behavior Recognition in Classroom Scenarios——Hongye Zhu; Jinhua Zhao*
- **47** Entity Recognition in Arithmetic Word Problem Based on BERT and Boundary Detection——Rao Peng*; Chensi Li; Zebin Wu; Xinguo Yu
- **78** Leveraging Blockchain Technology for a secure IoT data sharing——Nidhin C. Narayanan; Chandana Withana; Amr Elchouemi; Gaohong Li (待定)
- **79** Cloud and IoT Cybersecurity applied to Environmental Science in Critical National Infrastructure —— Josh Tipping; Chandana Withana; Feng Xiong (待定)