IEIR
WUHAN 2022

Conference Program

IEIR2022

International Conference on Intelligent Education and Intelligent Research.

華中師範大學 CENTRAL CHINA NORMAL UNIVERSITY

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

IEIR 2022 Organization Committee

General Co-Chairs

- **Xinguo Yu,** Central China Normal University, China
- **Jun Shen,** University of Wollongong, Australia

Technical Program Chairs

- Wei Wang, East China Normal University, China
- Guangyou Zhou, Central China Normal University, China
- Lei Niu, Central China Normal University, China

Publicity Chairs

- Wenbin Gan, National Institute of Information and Communications Technology (NICT), Japan
- Muhammad Haroon Yousaf, University of Engineering & Technology Taxila, Pakistan
- Pengpeng Jian, North China University of Water Resources and Electric Power, China
- Chunjuan Song, Hubei Invention Association, China

Publication Chairs

- Shengbing Tang, Central China Normal University, China
- Jinhua Zhao, Central China Normal University, China
- Chao Sun, Central China Normal University, China

Special Sessions, Panels & Workshops Chair

- Rui Hou, South-Central Minzu University, China
- Di Wu, Central China Normal University, China
- Liyong Wan, South-Central Minzu University,China

Local Organizing Committee

- Zhizhong Zeng, Central China Normal University, China
- Yann Berquin, Central China Normal University, China
- Bin He, Central China Normal University, China
- Ting Zhang, Central China Normal University, China

Secretariat

- Jingwen Luo, Central China Normal University, China

IEIR 2022 Program Committee

- Abdelhalim Benachenhou, Université Abdelhamid Ibn Badis - Mostaganem
- Anand Nayyar, Duy Tan University, Vietnam
- ANDRÉS MUÑOZ, UPM
- Anna Mróz, Pedagogical University of Cracow
- Arturo Miguel de Priego, STEM and EECS Academy EIRL
- Charles Walker, Auckland University of Technology
- CHEKRY Abderrahman, Graduate School of Technology of Safi, University Cadi Ayyad
- Ching Biau Tzeng, Kun Shan University
- Daithi Ó Murchú, Dublin West Education Centre
- ELAINE SOEIRA, INSTITUTO FEDERAL DE ALAGOAS
- Elena Railean, American University of Moldova
- Eric Bates, Technological University Dublin
- FD TRUJILLO-AGUILERA, UNIVERSITY OF MALAGA
- Giselle Pempedjian, Lebanese American University
- Haidar Harmanani, Case Western Reserve University
- Hiroyuki Kameda, Tokyo University of Technology
- Hiroyuki Mitsuhara, University of Tokushima
- Hitoshi Sasaki, Takushoku University
- Jose Carlos M. M. Metrôlho, Polytechnic Institute of Castelo Branco
- Jozef Hvorecky, Institute of Technology and Economics in Ceske Budejovice
- Luca Sorbello, Tor Vergata
- Man Fung LO, The Education University of Hong Kong
- María Elena Mendiola Medellín, ESIME Culhuacan IPN
- Mary de Lepe, AugMEDed
- Michael Vallance
- Mihai Caramihai, University POLITEHNICA Bucharest
- Mitsugu Terada, Fukuoka University
- Neelakshi C Premawardhena, University of Kelaniya
- Nelson Piedra, UTPL
- Nikolaos Pellas, University of Western Macedonia
- Peter Ilic, University of Aizu
- Ramesh Sharma, Ambedkar University Delhi
- Rishi Kumar, Rishi
- Sebastian Martin, University of Malaga
- Shengbing Tang, Central China Normal University
- Vladimir Ivan Evi, University of Novi Sad, Faculty of Technical Sciences
- Yih-Ruey Juang, Jinwen University of Science and Technology
- Yuchen Wang, Zhejiang University of Science and Technology

Guidance to Attend IEIR2022

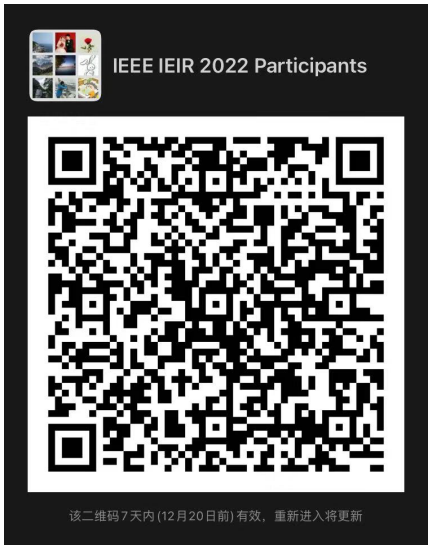
- Under the pandemic circumstance, the organizing committee decides to hold IEIR2022 virtually. The online Zoom meeting information are as follow.
- **Zoom meeting ID：409 215 2652 Password：1218**
  The following Tencent meeting as a backup approach in case that Zoom is not available.
  Tencent meeting：409 215 2652 Password：1218

- Each Oral presentation, **10 minutes for presentation and 5 minutes for Q&A.**
- Posters will be displayed on the on the IEIR website **www.ieir2022.org**.

18th, December 14:00-18:00	***Device & Connection Test***
19th, December 8:30-13:00 15:00-18:00	***Keynote & Oral Presentation***
20th, December 8:30-12:30	***Keynote & Oral Presentation***

Join WeChat Group for IEIR2022

- WeChat Group for IEIR2022 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. The QR code is available until 20th Dec. 2022 (Beijing Time).
- Joining the WeChat group is highly recommended; however, it is not compulsory.
- Announcements will also be posted on the IEIR2022 website.
- Best paper and best student paper will be announced at the closing ceremony.



Keynote SPEAKERS

Prof. Xinguo Yu,

Professor of National Engineering Research Center for E-Learning

Dean of CCNU Wollongong Joint Institute, Central China Normal University, China

Speech Title: Man and AI Synergy Capacity

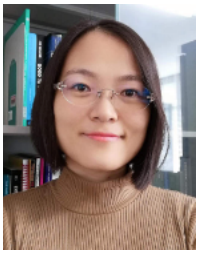
Abstract:

Artificial intelligence accumulates a new type of cognitive capacity that is different from the human cognitive capacity, and they can be deemed complementary to each other. They can form the man-and-AI synergy capacity for both research and education. Man-and-AI synergy capacity has played an important role in scientific research since 1970s, and it has helped academics in an increasing amount of scientific breakthroughs in recent years. Some progresses have also been achieved in developing educational systems using man-and-AI synergy. It is foreseeable that man-and-AI synergy capacity will be able to make even greater impact on empowering scientific research and education as related theories and technologies mature.

Biography:

Dr. Xinguo Yu is the chair of Hubei Society of Artificial Intelligence in Research and Education, the dean of CCNU Wollongong Joint Institute and a professor of National Engineering Research Center for E-Learning at Central China Normal University, Wuhan, China. He is a senior member of both IEEE and ACM, and an adjunct professor of University of Wollongong, Australia. He is a vice director of Smart Educational Technology Branch Society under Automation Society in China. He received B.Sc. degree in Mathematics from Wuhan University of Technology, M. Eng degree from Huazhong University of Science and Technology, another M. Eng. degree from Nanyang Technological University, Singapore and Ph.D. degree in Computer Science from National University of Singapore. His current research mainly focuses on intelligent educational technology, intelligent research technology, educational robotics, multimedia analysis, computer vision, and machine learning. He has published over 170 research papers. He is Associate Editor and Guest Editors for several international journals. He was general chairs or program chairs or keynote speakers for more than 20 international conferences

Keynote SPEAKERS



Prof. *Jingjing Lin*

Assistant Professor in the Center for IT-based Education (CITE),

Toyohashi University of Technology, Japan

***Speech Title: Online Journal Club Events for Better Scholarly Reading Habits and Skills: Research and Development at* ResearchIC**

Abstract: For researchers, reading scholarly publications is analogous to inhaling, while writing them is analogous to exhaling. Typically, reading existing literature on a topic is required prior to engaging in a scientific discussion on it. Therefore, a researcher's scholarly reading ability is a crucial factor in determining their research productivity and career success. This keynote will introduce "ResearchIC," a three-year research and development project funded by the JSPS Grant-in-Aid for Early Career Scientists. On the research side, ResearchIC will invite 100 educational researchers from around the world to share their techniques for locating, reading, and organizing scientific literature. In addition, it will create an educational research literature reading test (ERLRT) to measure a person's ability to read educational research literature. On the application side, the project has developed an open access platform (https://researchic.com) that enables researchers and research students in the field of education science to organize and participate in online journal club events as a means of developing better scholarly reading habits and skills. The ResearchIC project has the potential to benefit numerous researchers and research students in the education science community and beyond.

Biography: Jingjing Lin, PhD, is an Assistant professor in the Center for IT-based Education (CITE) at Toyohashi University of Technology, Japan. She is also the founder of ResearchIC.com, a platform to host and attend online journal club events for better research literacy in the domain of education science. She received her doctoral degree in communication sciences at USI Università della Svizzera italiana (Switzerland), master's degree in IT in education at The University of Hong Kong, and bachelor degree in public administration at Harbin Engineering University, China. Her research interests cover eLearning, active learning, research literacy, entrepreneurship education, and MOOCs. She was the winner of the MAJ Best Open Courseware Award (Honorable Mention), the IFITT Best PhD Proposal Award 2017, the Innosuisse Innovation Cheque voucher 2019, and the JSPS Postdoctoral Fellowship for Overseas Researcher 2019. She is a member of APA, IEEE, IEEE Education Society, and AERA.

Opening Ceremony & Keynote 8:30-9:30	***Man and AI Synergy Capacity*** ***Prof. Xinguo Yu***
Session 1 ***9:30 – 11:00 19th, December*** ***Oral Presentation Chair:*** ***Xiuhan Li*** ***Zoom：409 215 2652 Password：1218***	• **32** Determining Critical Success Factors for an Online Laboratory Learning System Using Delphi Method——Fahmy, Ahmed; abdelkhaliq, ahmed*; Elmesalawy, Mahmoud M. • **48** Student Action Recognition Based on Fuzzy Broad Learning System——Wei, Yantao; Lei, Fen; Gao, Jie; Li, Xiuhan* • **41** Combining Coverage with TMPS for Reviewer Assignment——Xu, Lu; Zeng, Daojian; Dai, Jianhua*; Gui, Lin • **4** The Effects of Contextualized Learning Content and Collaborative Behaviours in a Ubiquitous Learning Environment——Chen, Min; Zhou, Chi*; • **87** An Intelligent Tutoring System for Math Word Problem Solving with Tutorial Solution Generation——Wu, Shishun*; Xu, Xuebi; Liu, Rui; Liang, Guanghua; Meng, Hao; He, Bin • **55** An Efficient Model For Student Behavior Recognition in Classroom——Zhu, Hongye; Zhao, Jinhua*; Niu, Lei

Oral Presentation Duration: 10 minutes Presentation + 5 minutes Q&A

Session 2 ***11:00 – 13:00*** ***19th, December*** ***Oral Presentation Chair:*** ***AlZahrani, Yazeed*** ***Zoom：*** ***409 215 2652*** ***Password：*** ***1218***	• **11** Equipping Mathematics Tutoring Systems with Personalized Learning Strategies——Yu, Xinguo*; Xia, Jing; Cheng, Weina • **71** Prospects in Man-AI Cooperation for Algorithm Innovation——Yu, Xinguo* • **80** The Spatio-temporal Hybrid Development Methodology for Smart IoT: A Review based Study——AlZahrani, Yazeed*; Shen, Jun; Yan, Jun • **46** Comparative Analysis of Problem Representation Learning in Math Word Problem Solving——He, Bin*; Liang, Guanghua; Chen, Shengnan; Pan, Kewen; Miao, Zhangwen; Huang, Litian • **54** An intelligent tutoring system for function learning supported by a relation-centric solving algorithm——Sun, Huihui*; Yu, Xinguo • **23** A Graph Convolutional Network Feature Learning Framework for Interpretable Geometry Problem Solving——Fucheng, Guo; Jian, Pengpeng* • **31** A Novel Geometry Problem Understanding Method based on Uniform Vectorized Syntax-Semantics Model——Huang, Litian*; Yu, Xinguo; He, Bin • **30** Prompt-based Missing Entity Recovery for solving Arithmetic Word Problems——Liang Xue, Hao Meng, Bin He, Xinguo Yu

Session 3 ***15:00 – 16:30*** ***19th, December*** ***Oral presentation Chair:*** ***Zhifeng Wang*** ***Zoom：*** ***409 215 2652*** ***password：*** ***1218***	• **3** Smart Contract Vulnerability Detection for Educational Blockchain Based on Graph Neural Networks——Wang, Zhifeng*; Wu, Wanxuan; Zeng, Chunyan; Yao, Jialong; Yang, Yang; Xu, Hongmin • **5** YOLOv5 Enhanced Learning Behavior Recognition and Analysis in Smart Classroom with Multiple Students——Wang, Zhifeng*; Yao, Jialong; Zeng, Chunyan; Wu, Wanxuan; Xu, Hongmin; Yang, Yang • **56** LFCKT: A Learning and Forgetting Convolutional Knowledge Tracking model——Li, MengJuan; Niu, Lei*; Zhao, Jinhua; Wang, Yuchen • **21** Analysis of Group Online Collaborative Learning Based on Log Data And ICAP——Chenyang, Wang* • **22** An empirical study on the factors influencing college students' intention to use the English Vocabulary APP——Yang, Mengxi*; Jin, Yanyan; Zhang, Zheng • **78** Formative assessment for hybrid course in smart classroom: A cognitive presence perspective —— Yan Hu ,; Jian Shen; Rui Hou; Huan Huang

Session 4 ***16:30 – 18:00*** ***19th, December*** ***Oral presentation Chair:*** ***Jian Pengpeng*** ***Zoom：*** ***409 215 2652*** ***Password：*** ***1218***	• **29** A BERT-based Pre-training Model for Solving Math Application Problems——Jia, Yuhao; Wang, Pingheng; Zhang, Zhen*; Cheng, Chi; Li, Zhifei; Yu, Xinguo • **2** Teacher Attention Measurement Based on Head Pose Estimation——Wan, Shuo; Chen, Zengzhao*; Wang, Mengke; Shi, Yawen; Zhu, Shenghu • **8** Recognizing boundaries of online professional learning communities in an automated discourse analysis approach——Zhang, YuTing*; Guo, Tongyu • **38** I-portrait: A multidimensional student portrait system for learning situation analysis——Zhang, Xinyan; Chen, Yuqi; Hu, Junjie; Hu, Shengze; Huang, Tao* • **17** The Development and Application of Augmented Reality Educational Game in English Learning—— Xia, Dan; Zhang, Yu; Qiu, Tongjing • **68** A Comparative Analysis of Math Word Problem Solving on Characterized Datasets——Chen, Shengnan*; Wang, Pingheng; Zhou, Mengyuan; Gu, Shiwen; Wang, Zirui; He, Bin

Keynote 8:30-9:30 20th, December	***Online Journal Club Events for Better Scholarly Reading Habits and Skills: Research and Development at ResearchIC*** ***Prof. Jingjing Lin***
Session 5 ***9:30 – 11:00*** ***Oral presentation Chair:*** ***Heng Luo11*** ***Zoom：409 215 2652 password：1218***	• **18** Comparison of three learner profiles under the influence of the "double reduction" policy —— Evidence from the K-means clustering approach——Huang, Qinglin*; Zhang, Zhili; Jiang, Siyi; Liao, Xiaofang; Luo, Heng • **27** Intelligent Multimodal Analysis Framework for Teacher-student Interaction——Wang, Mengke; Chen, Zengzhao; Lu, Yuanyuan; Zheng, Qiuyu; Li, Jiawen; Gao, Wei* • **39**. Is the research on AI empowered pedagogy in China decaying?——Chen, Cheng* • **44** Design a Cloud-enabled Humanoid Robot Application System to Assess the ABA Learning for Autistic Children——Wang, Ziyuan*; Chen, Yiwei; Hei, Xiaojun • **61** An Analysis Method of Online Learning Emotional Experience based on Cloud Model——Yumin, Zheng*; Chaowang, Shang; Feng, Cheng; Yue, Han

Session 6 ***11:00 – 12:30 20th, December*** ***Oral presentation Chair:*** ***Leyuan Liu*** ***Zoom：409 215 2652 Password：1218***	• **82** Rapid Screening of Children with Autism Spectrum Disorders Through Face Image Classification——Zheng, Yuyu*; Liu, Leyuan • **84** Development of a Virtual Simulation Experiment Platform for Intelligent Substation to Promote the Integration between Industry and Education——Li, Tianran* • **85** Scene Parsing via Tree Structure Enhancement Lightweight Network——Huang, Wenxin; Liu, Wenxuan*; Jia, Xuemei • **37** Explore the interrelationship of cognition, emotion and interaction when learners engage in online discussion——Yue, Li*; Su, Zhu • **28** Classification of Students' Attentional States Using Attention Mechanism and BiLSTM Fusion——Li, Chen*; Yang, Qing; Li, Ming; Wen, Dou; Wang, Yaqun • **12** Design and application of a physical programming courses for the development of multiple intelligences in children——Liu, Meijuan*; Deng Wei; Cong, Xiangmiao; Shen, Minyu

Online Posters ***Address:***	• **1** Linear Function Relation Identification based on BERT and Bi-LSTM——Li, ChenSi*; Yu, Xinguo; Peng, Rao • **9** Research on intelligent scoring method of standardized Chinese character writing——Shu, Jiangbo*; Lu, Shuaicheng; Li, Jianran; Zeng, Jingli • **10** Approaches and Quality of Algorithm Evaluation——Yu, Xinguo*; Xia, Jing; Cheng, Weina • **25** Scientific Documents Collection and Summarization for Survey Writing——Luo, Fan*; Yu, xinguo • **40** Solving Word Function Problems in Line with Educational Cognition Way——Wang, bin* • **45** Automatic Recognition of Speech Acts in Classroom Interaction Based on Multi-text Classification——Xia, Miao Feng; Deng, Wei*; Liu Meijuan • **58** An approach to optimize Lab-seat Allocation problem based on multi-agent negotiation——Li, Kai; Niu, Lei*; Yang, Yang; Wang, Yuchen • **65** A Dynamic Keyboard with Hierarchical Mathematical Symbols for Multi-Subject e-Learning Systems——Xu, Xuebi*; Wu, Shishun; Gu, Shiwen; He, Bin; Yu, Xinguo • **74** Framework Design of Intelligent Career Recommendation System for Undergraduates——Liu, Wenbin; Niu, Lei*; Zhao, Jinhua