Zifeng Liu

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EDUCATION

University of Florida Gainesville, FL, USA *Ph.D. in Curriculum and Instruction specializing in Educational Technology Sep. 2023 – present*

- Advisor: Dr. Wanli Xing
  - Cumulative GPA: 3.9/4.0
  - Research Assistant (Full tuition & stipends): 2023 ~
  - Doctoral Dissertation:

Beijing Normal University, China *Master of Computer Software and Theories Sep. 2020 – May. 2023*

- Advisor: Dr. Su Cai
  - Cumulative GPA: 3.7/4.0
  - First Prize of Excellent graduate Student Scholarship (2020-2021, 2021-2022)
  - Outstanding Freshman Scholarship (2020)
  - Excellent Individual of Summer Volunteer Teaching Program of BNU (2022)
  - Master's thesis: *Facial expression recognition and application based on contrastive learning and visual attention*

Beijing Technology and Business University, China *Bachelor of Computer Science and Technology Sep. 2016 – May. 2020*

- Advisor: Dr. Zhongming Han and Dr. Yi Chen
  - Cumulative GPA: 4.27/5.0 (Ranked number 1 among 58 students)
  - Excellent Graduate of Beijing (2020)
  - National Scholarship of China (2018-2019)
  - Headmaster Scholarship of BTBU (2018-2019)
  - Outstanding Student Scholarship of BTBU (2018,2019)
  - Student LeaderShip Award of BTBU (2017-2018)
  - National Scholarship for Encouragement of China (2016-2017, 2017-2018)

RESEARCH INTERESTS

- AI/Computer Science Education
- Educational Data Mining/Learning Analytics
- STEM-integrated Computing Education

CURRENT RESEARCH EXPERIENCE

Using Flow-Based Music Programming to Engage Children in Computer Science
(Funded by NSF iTEST # 2241715, $1,227,507; PI: Dr. Wanli Xing) **FL,CA, USA** *Researcher Sep. 2023 – present*

- Led the flow-based music programming platform Mflow development.
- Led the design and development of instruments for teachers and students.
- Led the professional development interviews for 3 elementary school teachers.
- Contributed to the 2024 Spring classroom study to examine the efficacy of Mflow platform and the curriculum.

ALTER-Math : AI-augmented Learning by Teaching to Enhance and Renovate Math Learning
(Funded by Learning Engineering Virtual Institute (LEVI), Schmidt Future Foundation, PI: Dr. Wanli Xing)
FL, USA *Researcher Oct. 2023 – present*

- Contributed to the classroom study to examine the efficacy of the ALTAR-Math platform in P.K.Yonge research school.
- Contributed to the log data analysis on how students interact with the AI teachable agent.

A Student-centered Interactive Mathematical Learning and Creation Platform powered by AI
(Funded by Department of Education #91990023 C0022, $4,000,000, PI: Dr. Wanli Xing)
FL, CA, USA *Researcher Apr. 2024 – present*

- Contributed to the organization of a classroom study to examine the initial efficacy of the ART-Math platform.
- Contributed to usability interviews for about 20 elementary school teachers and five teachers across the United States.

VETS-HASTE: Veterans SkillBridge through Industry based Hardware Security Training and Education
(Funded by NSF: # 2322465, $1,000,000; PI: Dr. Wanli Xing) **FL, USA** *Researcher Oct. 2023 – present*
- Contributed to the intervention study to examine the usability of IVE (Immersive Virtual Environment) platform.
- Organizing and preprocessing collected data, performing statistical analyses to assess usability metrics.

Innovating Quantum-Inspired Learning for Undergraduates in Research and Engineering (INQUIRE)
(Funded by NSF IUSE program #2142552, $1,250,000, PI: Dr. Gloria Kim, Co-PI: Dr. Wanli Xing)
Researcher Nov. 2023 — present
- Led the efficacy research on Spin-Qubit Lab (a simulation-based educational technology) in the University of Florida.

A Logic Programming Approach to Integrate Computing with Middle School Science Education
(Funded by NSF: #1901704, $421,755; PI: Dr. Yuanlin Zhang, Co-PI: Dr. Wanli Xing)
FL, USA *Researcher Apr. 2024 – present*
- Analyzing students learning log data using entropy analysis and connecting entropy analysis with student performance.

SELECTED PUBLICATIONS

JOURNAL PUBLICATIONS
- **Liu, Z**., Xing, W., Jiao, X. et al. What are the differences between student and ChatGPT-generated pseudocode? Detecting AI-generated pseudocode in high school programming using explainable machine learning. *Education and Information Technologies* (2025). https://doi.org/10.1007/s10639-025-13385-z.
- Song, Y., Kim, J., **Liu, Z**., Li, C., & Xing, W. (2025). Students' perceived roles, opportunities, and challenges of a generative AI-powered teachable agent: a case of middle school math class. *Journal of Research on Technology in Education*, 1–19. https://doi.org/10.1080/15391523.2024.2447727.
- Song, Y**.,** Kim, J., Xing, W., **Liu, Z.**, Li, C., Oh, H. (2025). Elementary school students' and teachers' perceptions towards creative mathematical writing with generative AI. Manuscript accepted for publication to *Journal of Research on Technology in Education.*
- Zhu, W., Xing, W., Kim, E. M., Li, C., Wang, Y., Yang, Y., & **Liu, Z**. (2025). Integrating image-generative AI into conceptual design in computer-aided design education: Exploring student perceptions, prompt behaviors, and artifact creativity. *Educational Technology & Society, 28*(3), 166-183. https://doi.org/10.30191/ETS.202507_28(3).SP11.
- Cai, S., **Liu, Z**., Liu, C., & others. (2022). Effects of a BCI-based AR inquiring tool on primary students' science learning: A quasi-experimental field study. *Journal of Science Education and Technology, 31,* 767–782. https://doi.org/10.1007/s10956-022-09991-y.
- Liu, E., Cai, S., **Liu, Z.**, & Liu, C. (2023). WebART: Web-based augmented reality learning resources authoring tool and its user experience study among teachers. *IEEE Transactions on Learning Technologies, 16*(1), 53–65. https://doi.org/10.1109/TLT.2022.3214854.

UNDER REVIEW WORK
- **Liu, Z.**, Xing, W., Jiang, Y., & Li, C. (under review). Implementing fair and explainable AI-generated responses for online learning discussion support. Manuscript submitted for publication to *Journal of Learning Analytics*.
- **Liu, Z.**, Xing, W., Jiang, Y., Li, C., Kim, T., & Li, H. (under review). Leveraging contrastive learning to improve group and individual fairness in predictive analytics for online learning. Manuscript submitted for publication to *Journal of Computing in Higher Education*.
- **Liu, Z.**, Xing, W., Li, C., Zhang, F., Li, H., & Minces, V. (under review). Exploring automated assessment of primary students' creativity in a flow-based music programming environment. Manuscript submitted for publication to *Journal of Learning Analytics*.
- Xing, W., **Liu, Z.,** Song, Y, & Kim, T**.** (under review). Why do students leave instructional videos: understanding students' in-video dropout behavior in a large online math learning platform? Manuscript submitted for publication to *Distance Education*.

▪ Xing, W., Song, Y.**,** Li, C., **Liu, Z**., Zhu, W., Oh, H. (Minor revision submitted). Development of a generative AI-powered teachable agent for middle school mathematics learning: a design-based research study. Manuscript submitted for publication to *British Journal of Educational Technology*.

PUBLISHED CONFERENCE PROCEEDINGS

▪ **Liu, Z.**, Zhang, S., Israel, M., Smith, R., Xing, W., & Minces, V. (2025). Engaging K-12 students with flow-based music programming: An experience report on its impact on teaching and learning. *In Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE TS 2025)*, February 26–March 1, 2025, Pittsburgh, PA, USA.

▪ **Liu, Z.**, Jiao, X., Xing, W., & Zhu, W. (2025). Detecting AI-generated pseudocode in high school online programming courses using an explainable approach. *In Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE TS 2025)*, February 26–March 1, 2025, Pittsburgh, PA, USA.

▪ **Liu, Z.**, Guo, R., Jiao, X., Gao, X., Oh, H., & Xing, W. (2024, June). How AI Assisted K-12 Computer Science Education: A Systematic Review. In *2024 ASEE Annual Conference & Exposition*.

▪ **Liu, Z.**, Guo, R, Song, Y., Xing, W. (2024). WIP: understanding students' in-video dropout behavior in large online math learning platform. In Proceedings of 2024 IEEE Frontiers in Education, Oct 13–16, 2024, Washington, D.C., USA.

▪ **Liu, Z.**, Jiao, X., Li, C., & Xing, W. (2024). Fair Prediction of Students' Summative Performance Changes Using Online Learning Behavior Data. In *Proceedings of the 17th International Conference on Educational Data Mining* (pp. 686-691).

▪ Oh, H.,**Liu, Z.**, & Xing, W. (2025). Do actions speak louder than words? Unveiling linguistic patterns in online learning communities using cross recurrence quantification analysis. In *Proceedings of the 15th International Conference on Learning Analytics and Knowledge* (LAK2025) (pp. 1–7).

▪ Li, H., Xing, W., Li, C., Zhu, W., Lyu, B., Zhang, F., & **Liu, Z.** (2025, March). Who Should Be My Tutor? Analyzing the Interactive Effects of Automated Text Personality Styles Between Middle School Students and a Mathematics Chatbot. In *Proceedings of the 15th Learning Analytics and Knowledge Conference* (LAK2025) (pp. 1–7).

▪ Monteith, B., **Liu, Z.**, Chao, J., Wiedemann, K., Fofang, J. B., Li, L., Ma, D., Mohamed, R., Mondol, A., Jo, Y., Fleetwood, A., Lipien, L., Zhang, Y., & Xing, W. (2025, February 17–19). Using entropy analysis to explore student engagement in an online high school data science course. Presented at *DSE-K12 Conference 2025*, Hyatt Regency San Antonio Riverwalk, San Antonio, TX, USA.

▪ **Liu, Z.**, Xing, W., & Li, C. (2024, July). Explainable analysis of AI-generated responses in online learning discussions. In Educational Data Mining 2024 Workshop: Leveraging Large Language Models for Next-Generation Educational Technologies. https://doi.org/10.13140/RG.2.2.24309.38881

▪ Oh, H., Guo, R., Xing, W., **Liu, Z**., Song, Y., & Li, C. (2024, June). The Seamless Integration of Machine Learning Education into High School Mathematics Classrooms. In *2024 ASEE Annual Conference & Exposition*.

▪ Jiao, X., **Liu, Z**., Zhou, H., & Cai, S. (2022, July). The Effect of Role Assignment on Students' Collaborative Inquiry-based Learning in Augmented Reality Environment. In *2022 International Conference on Advanced Learning Technologies (ICALT)* (pp. 349-351). IEEE.

▪ Feng, Z., Gong, C., Jiao, X., **Liu, Z**., & Cai, S. (2022, July). The Effects of AR Learning Environment to Preschool Children's Numerical Cognition. In *2022 International Conference on Advanced Learning Technologies (ICALT)* (pp. 352-356). IEEE.

▪ **Liu, Z.**, Jiao, X., & Cai, S. (2021, April 4). *Effects of augmented reality on students' online physics learning*. Paper presented at the 2021 Annual Meeting of the American Educational Research Association (AERA), Virtual Conference. Retrieved August 25, 2022, from the AERA Online Paper Repository.

▪ Jiao, X., **Liu, Z.**, & Cai, S. (2020, November 23–27). *Impact of embedded cognitive scaffolding of augmented reality technology on elementary school students' science learning*. Paper presented at the 28th International Conference on Computers in Education (ICCE 2020), Virtual Conference.

Patent

▪ Cai, S., **Liu, Z.**, Changhao Liu, & Haitao Zhou. (2021). *A non-invasive brain-computer interface-based*

attention feedback method (Patent No. ZL 2021 1 1283053.5).
- Cai, S., **Liu, Z.**, & Zhang, Y.. (2023, submitted). *A grid-based self-attention facial expression recognition method using supervised contrastive learning*. (Patent pending).

PROFESSIONAL WORK EXPERIENCE
University of Florida, USA
Graduate Research Assistant *Aug. 2023– present*
- Working on the design and development of an educational website called Mflow, using Flow-Based Music Programming to engage children in computer science.
- Conducting research on how AI assists K–12 computer science education.
- Leading research sub-projects on AI fairness and LLMs for online learning

Department of Education, Beijing Normal University
Research Assistant, VR/AR in Education Laboratory Beijing, Sep. 2021 – July 2023
- Designed and developed AR applications for K–12 education, implementing object recognition and plane detection using C#.
- Developed and maintained data validation and storage servers using Java.
- Studied the impact of the AR learning environment on student learning and teacher instruction.

Computer Network Information Center, Chinese Academy of Sciences
Research Assistant, Advanced Interactive Laboratory Beijing, Oct. 2019 – May. 2020
- Participated in and completed the visualization research of multi-person and multi-dimensional data interactive sharing based on AR.
- Developed Augmented Reality software for satellite science using C#, successfully registered it under Software Copyright (Registration No. 2020R11L426768).

SERVICE/LEADERSHIP

Reviewer
Academic journals
- Reviewer of the Computers & Education (C&E) (2024)
- Reviewer of the Education and Information Technologies (EIT) (2024)
- Sub-reviewer of special issue on the Equity of Artificial Intelligence in Higher Education, Journal of Computing in Higher Education (2024)

Conferences
- The 15th International Learning Analytics & Knowledge Conference (LAK Poster Session) (2025)
- Special Interest Group for Computer Science Education (SIGCSE) (2024)
- International Conference on Educational Data Mining (EDM) (2024)
- Association for Educational Communications and Technology (AECT) (2024)
- Association Society for Engineering Education (ASEE) (2024, 2025)
- IEEE Frontiers in Education (IEEE FIE) (2024)
- IEEE Global Engineering Education Conference (IEEE EDUCON) (2025)
- American Educational Research Association (AERA) (2024)

LANGUAGES AND SKILLS
- Language: Mandarin (Native) English (Fluent)
- Certifications: Machine Learning, Deep Learning (Coursera Certificate)
- Programming: Python, C#, HTML, Javascript, R