Zifeng (Lauren) Liu

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EDUCATION

University of Florida Gainesville, Florida, USA
Ph.D. in Curriculum and Instruction specializing in Educational Technology (Sep. 2023 – Aug. 2026 Expected)
- Advisor: Dr. Wanli Xing
- Cumulative GPA: 3.95/4.0
- Research Assistant (Full tuition & stipends): 2023 ~ present
- Doctoral Dissertation: *Investigating the Effects of Integrating Artificial Intelligence Concepts into Mathematics Learning in Virtual Schools*
- Committee: Dr. Wanli Xing, Dr. Maya Israel, Dr. Anthony Botelho, and Dr. Corinne Manley

Beijing Normal University, Beijing, China
Master of Engineering, Computer Software and Theories Sep. 2020 – May. 2023
- Advisor: Dr. Su Cai
- Cumulative GPA: 3.70/4.0
- Master's thesis: *Facial Expression Recognition and Application based on Contrastive Learning and Visual Attention*

Beijing Technology and Business University, Beijing, China
Bachelor of Computer Science Sep. 2016 – May. 2020
- Advisor: Dr. Zhongming Han and Dr. Yi Chen
- Cumulative GPA: 4.27/5.0 (Ranked number 1 among 58 students)
- Bachelor thesis: *Multi-User and Multi-Dimensional Interactive Data Visualization*

RESEARCH INTERESTS

- AI, Computing Education
- Educational Data Mining
- Learning Analytics
- STEM-integrated Computing Education
- Fair, accountable, and transparent (FAccT) AI

AWARDS & HONORS

- Vernice Law Hearn Scholarship for Outstanding Graduate Students, University of Florida (2025, $2,000.00)
- Best Full Paper Award, the 25th IEEE International Conference on Advanced Learning Technologies (ICALT 2025)
- ACM International Computing Education Research (ICER) Conference Travel Grant (2025, $500)
- First Prize of Excellent graduate Student Scholarship, Beijing Normal University (2021, 2022, ¥12,000.00)
- Best Paper Award nomination, the 28th International Conference on Computers in Education (ICCE 2020)
- Outstanding Freshman Scholarship, Beijing Normal University (2020, ¥10,000.00)
- Excellent Individual of Summer Volunteer Teaching Program, Beijing Normal University (2022)
- Excellent Graduate of Beijing, Beijing Municipal Education Commission (2020)
- National Scholarship of China, Ministry of Education of China (2018-2019, ¥8000.00)
- Headmaster Scholarship, Beijing Technology and Business University (2018-2019, ¥2,000.00)
- Outstanding Student Scholarship, Beijing Technology and Business University (2018, 2019)
- Student LeaderShip Award, Beijing Technology and Business University (2017-2018)

▪ National Scholarship for Encouragement of China, Ministry of Education of China (2016, 2017, ¥5000.00)

CURRENT RESEARCH EXPERIENCE

1. AI Across the Curriculum for Virtual Schools *Researcher Aug. 2024 - present*
(Funded by DOE EIR #S411C230070, $3,999,322; PI: Dr. Jie Chao (Concord), Co-PI: Dr. Wanli Xing)
▪ Led Research about how to use GenAI support pedagogical multi-choice questions distractor and feedback generation.
▪ Led Research about student learning profile when interacting with online AI learning modules.
▪ Co-design the AI-integrated math curriculum in virtual learning environments for high school students.
▪ Create the learning objectives and activities aligning with the AI big ideas and math standards.
▪ Design the user interface for virtual learning environments and conduct user testing.

2. 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.

3. eSPAC3: A Culturally Relevant Approach to Spatial Computational Thinking Skills and Career Awareness through an Immersive Virtual Environment
(Funded by NSF iTEST, $227,619. PI: Dr. Wanli Xing) *Researcher* Sep. 2023 – *present*
▪ Led the design and development of survey instruments targeting peer mentors, parents, and students.
▪ Conducted analysis of pre- and post-survey data assessing Spatial Computational Thinking and self-efficacy.

4. 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 in P.K.Yonge research school.
▪ Contributed to the log data analysis on how students interact with the AI teachable agent.

5. 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 – Apr. 2025*
▪ Analyzing students learning log data using entropy analysis and connecting it with student performance.

6. ML4Math: Integrating Machine Learning and Mathematics Education Using a Concreteness Fading Approach
(Funded by ONR: #N00014-23-S-F001 , $600,000 ; PI: Dr. Wanli Xing)
FL, USA *Researcher Apr. 2024 – Apr. 2025*
▪ Assisting classroom implementation and data collection.

7. 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 — Apr. 2025
▪ Led the efficacy research on Spin-Qubit Lab (a simulation-based tool) in the University of Florida.

8. 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 – Apr. 2025*
▪ 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 students and five teachers across the US.

PUBLICATIONS

Refereed Journal Articles (6 first-author papers & 2 second-author papers)

1. **Liu, Z.**, Xing, W., Jiang, Y. et al. Leveraging contrastive learning to improve group and individual fairness in predictive analytics for online learning. *Journal of Computing in Higher Education* (2025). https://doi.org/10.1007/s12528-025-09468-y [SSCI Q1, Impact Factor: 4.9]
2. **Liu, Z.**, Xing, W., Jiao, X., & Li, C. (2025). Exploring Fairness and Explainability in LLM-Generated Support for Online Learning Discussion Forums. *Journal of Learning Analytics*, 1-26. https://doi.org/10.18608/jla.2025.8885 **[**ESCI Q1**,** Impact Factor: 3.6]
3. **Liu, Z.**, Xing, W., Li, C., Zhang, F., Li, H., & Minces, V. (2025). Exploring Automated Assessment of Primary Students' Creativity in a Flow-Based Music Programming Environment. *Journal of Learning Analytics, 12*(2), 83-104. https://doi.org/10.18608/jla.2025.8835. **[**ESCI Q1**,** Impact Factor: 3.6]
4. **Liu, Z**., Xing, W., Jiao, X., & Li, C. 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. **[**SSCI Q1**,** Impact Factor: 5.4]
5. **Liu, Z.**, Xing, W., Ngo, B., Jiao, X. et al.. (2025). Engagement patterns of middle school students with AI teachable agents in mathematics learning. *Scientific Reports, 15*, 40971. https://doi.org/10.1038/s41598-025-24841-8 **[**SCIE Q1**,** Impact Factor: 3.9]
6. **Liu, Z.**, Cheon, S., Stanbury, A., Jiao, X., Xing, W., & Kang, H. (accepted, in press). *Towards contextual-based AI: A scoping review of artificial intelligence in X reality for personalized learning*. *Computers and Education: Artificial Intelligence*. [CiteScore: 28.7]
7. Xing, W., **Liu, Z.,** Song, Y., & Kim, T**.** 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*. https://doi.org/10.1080/01587919.2025.2579792 [SSCI Q1, Impact Factor: 3.0]
8. 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. [SSCI Q1, Impact Factor: 5.0]
9. Xing, W., Song, Y.**,** Li, C., **Liu, Z**., Zhu, W., Oh, H. (2025). Development of a generative AI-powered teachable agent for middle school mathematics learning: a design-based research study. *British Journal of Educational Technology.* 2043-2077. https://doi.org/10.1111/bjet.13586 [SSCI Q1, Impact Factor: 8.1]
10. Song, Y., Kim, J., Xing, W., **Liu, Z.**, Li, C., & Oh, H. (2025). Elementary school students' and teachers' perceptions toward creative mathematical writing with Generative AI. *Journal of Research on Technology in Education*, 1–23. https://doi.org/10.1080/15391523.2025.2455057. [SSCI Q1, Impact Factor: 5.0]
11. Xing, W., Fang, Z., Zhang, H., Kamiyama, T., **Liu, Z.**, & Kim, T. (2025). Making the 'mathematics register' accessible to students: an exploratory study of two teachers' discourse in an online lesson on polynomial expressions. *Language and Education*, 1–24. https://doi.org/10.1080/09500782.2025.2542861 [SSCI Q1, Impact Factor: 2.8]
12. Li, H., Xing, W., Zhu, W., Zhang, S., & **Liu, Z.** (2025). Should educational AI models include gender attribute? Explaining the why based on environmental psychology course with gender imbalance. *Journal of Computing in Higher Educatio*n. https://doi.org/10.1007/s12528-025-09467-z [SSCI Q1, Impact Factor: 4.9]
13. 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. [SSCI Q1, Impact Factor: 6.0]
14. 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. [SSCI Q1, Impact Factor: 5.5]
15. 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. [SSCI Q1, Impact Factor: 4.9]

Manuscripts Under Review and In Progress

1. **Liu, Z.**, Xing, W., Monteith, B., Pei, B., & Zhang, Y. (under Review). Engaging secondary students in data science learning through a mathematical logic approach: Insights from surveys and log data. Manuscript submitted for publication to *ACM Transactions on Computing Education*.
2. **Liu, Z.**, Zhang. S., Xing, W., Israel, M., & Minces, V. (in preparation). Connecting Music and Elementary Computing Education through Flow-Based Programming: Insights from Teachers and Students. Manuscript submitted for publication to *Computer Science Education*.
3. Xing, W., Song, Y., **Liu, Z.,** Du, H., Zhu, W., & Li, C**. (**under revision). Investigating Expert and Peer Tutoring Behaviors in a Large Online Discussion Forum Using Temporal Dynamic Analytics. Manuscript submitted for publication to *Journal of Learning Analytics*.
4. Jiao, X., **Liu, Z.,** Enhancing Collaboration in AR-based Inquiry: Effects of Structured Collaborative Scripts on Students' Performance and Group Dynamics.(under Review). Manuscript submitted for publication to *Journal of Science Education and Technology*.
5. Owoputi, R., Kwok, A., **Liu, Z.**, Zhu, W., Xing, W., & Ray, S. (major revision submitted). Immersive virtual environment for automotive security education. Manuscript submitted for publication to *IEEE Transactions on Education*.

Refereed Conference Proceedings

1. **Liu, Z.**, Li, H., Chao, J., & Xing, W. (2026, Jan.). *Brains vs. Algorithms? How experts and students see AI-generated distractors.* In *Proceedings of the 2026 AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-26).* [≈30% acceptance rate]
2. **Liu, Z.**, Li, L., Chao, J., Mondol, A., Xing, W., & Zhang, Y. (2026, Mar.). *Do all roads lead to AI literacy? Clustering behavioral patterns and examining outcomes in an online AI literacy module for secondary school students*. In *Proceedings of the 16th International Learning Analytics and Knowledge Conference (LAK '26)*. ACM. [≈30% acceptance rate]
3. **Liu, Z.**, Xing, W., & Fang, Z. (2026, Mar.). *Talking the Talk: Linking Instructional Discourse Patterns to Student In-video Dropout and Learning Outcome*. In *Proceedings of the 16th International Learning Analytics and Knowledge Conference (LAK '26)*. ACM. [≈30% acceptance rate]
4. Jiao, X., **Liu, Z.**, Mei, S., & Cai, S. (2025). Beyond the screen: Enhancing augmented reality collaborative inquiry with social scripts. In *Proceedings of the 16th International Learning Analytics and Knowledge Conference (LAK '26)*. ACM. [≈30% acceptance rate]
5. Du, H., **Liu, Z**., Xing, W., & Zhang, Y. (2025, Nov.). A logic-programming-based CS professional development for secondary teachers. Paper accepted for presentation at the 14th International Conference on Educational Innovation through Technology (EITT 2025), Tokyo City University, Yokohama, Japan.
6. Li, H., Xing, W., Li, C., & **Liu, Z**. (2025, December) Regularizing chart-specialized vision-language models for K-12 hand-drawn math VQA: Performance and representation effects. In *Proceedings of the 14th International Conference on Computational Data and Social Networks (CSoNet)*.
7. **Liu, Z.**, Ganapathy Prasad, P., Ngo, B., Jiao, X., & Xing, W. (2025). *A human–AI collaborative assessment of AI-generated vs. human-created MCQ distractors*. In *Proceedings of the 29th International Conference on Computers in Education (ICCE 2025)*, Chennai, India.
8. **Liu, Z.**, Jiang, Y., & Xing, W. (2026, Feb.). *Exploring the use of LLMs for assessing creativity in student programming artifacts.* In *Proceedings of the 57th ACM Technical Symposium on Computer Science Education (SIGCSE TS 2026)* ACM.
9. Kim, T., **Liu, Z.**, Xing, W., Li, H., & Oh, H. (2025, Jun.). Emotional dynamics in asynchronous math discussions: Analyzing the impact of negative emotions on learning outcomes. *In Proceedings of the 2025 International Conference of the Learning Sciences (ICLS 2025).* International Society of the Learning Sciences (ISLS). June 10–13, Finland. https://repository.isls.org//handle/1/11805 [≈30% acceptance rate]
10. Li, H., Xing, W., Zhu, W., Li, C., Lyu, B., **Liu, Z**., & Heffernan, N. (accepted). Leveraging multi-modality and collaborative filtering for supporting automatic scoring in mathematics education. In *Proceedings of the 26th International Conference on Artificial Intelligence in Education.* vol 2591. Springer, Cham.

https://doi.org/10.1007/978-3-031-99264-3_39 [≈30% acceptance rate]

11. Li, H., Xing, W., Lyu, B., Zhu, W., **Liu, Z.**, & Li, H. (accepted). An automated aesthetic assessment framework of mathematical story images validated by click counts. In Proceedings of the 18th ACM Conference on Learning@ Scale. https://doi.org/10.1145/3698205.3733923 [≈30% acceptance rate]
12. Jiao, X., Huang, H., **Liu, Z.**, Cai, S., & Fan, Z. (2025). Beyond the screen: Enhancing augmented reality collaborative inquiry with social scripts. In *Proceedings of the 25th IEEE International Conference on Advanced Learning Technologies (ICALT 2025)*, Changhua, Taiwan. IEEE. [Best Full Paper Award]
13. **Liu, Z.**, Song, Y., Yang, Q., Xing, W., & Guo, J. (2025, Jun.). Exploring the Impact of a Simulation-Based Learning Tool on Undergraduate Quantum Computing Education. In *2025 ASEE Annual Conference & Exposition*.
14. **Liu, Z.**, Zhang, S., Xing, W., Minces, V., Israel, & Barron, A. (2025, June). A NSF ITEST Program: Integrating Music and Flow-Based Programming Builds Teachers' Confidence in Computer Science. In *2025 ASEE Annual Conference & Exposition*.
15. **Liu, Z.**, Xing, W., Zhang, F., & Li, C. (2025, March). A visual programming approach to enhance spatial computational thinking skills in upper-elementary students [Poster]. The 15th International Learning Analytics & Knowledge Conference, Dublin, Ireland.
16. Oh, H., **Liu, Z**., & Xing, W. (2025, March 3–7). Do actions speak louder than words? Unveiling linguistic patterns in online learning communities using cross recurrence quantification analysis. In *Proceedings of the 15th International Learning Analytics and Knowledge Conference (LAK '25)* (pp. 992–998). Association for Computing Machinery. https://doi.org/10.1145/3706468.3706569 [≈30% acceptance rate]
17. 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). https://doi.org/10.1145/3706468.3706537 [≈30% acceptance rate]
18. **Liu, Z.**, Zhang, S., Israel, M., Smith, R., Xing, W., & Minces, V. (2025, Feb). 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. https://doi.org/10.1145/3641554.3701902 [≈30% acceptance rate]
19. **Liu, Z.**, Jiao, X., Xing, W., & Zhu, W. (2025, Feb). 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. https://doi.org/10.1145/3641554.3701942 [≈30% acceptance rate]
20. **Liu, Z.**, Monteith, B., 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.
21. **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.
22. **Liu, Z.**, Jiao, X., Li, C., & Xing, W. (2024, July). 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).
23. **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
24. **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*.
25. 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*.
26. 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.

27. 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.
28. **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.
29. 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. [Best Paper Nomination]

Patent

1. Cai, S., **Liu, Z.**, Changhao Liu, & Haitao Zhou. (China, 2021). *A non-invasive brain-computer interface-based attention feedback method* (Patent No. ZL 2021-1-1283053.5).
2. Cai, S., **Liu, Z.**, & Zhang, Y.. (2023, under review). *A grid-based self-attention facial expression recognition method using supervised contrastive learning*. (China, Patent pending).

Presentations

1. **Liu, Z.**, & Xing, W. (2026, April). *Exploring the use of LLMs for assessing creativity in student programming artifacts.* Paper presented at the 2026 American Educational Research Association (AERA) Annual Meeting, Los Angeles, CA.
2. Xing, W., & **Liu, Z.** (2026, April). *Exploring expert and peer tutoring dynamics in online learning discussions: A temporal learning analytics approach.* Paper presented at the 2026 American Educational Research Association (AERA) Annual Meeting, Los Angeles, CA.
3. Jiao, X., **Liu, Z.**, & Cai, S. (2026, April). *The role of group interaction patterns in shaping learning outcomes in AR-enhanced collaborative inquiry.* Paper presented at the 2026 American Educational Research Association (AERA) Annual Meeting, Los Angeles, CA.
4. Kim, T., **Liu, Z.**, Xing, W., & Roy, T. (2026, April). *One log, two stories: How learning order shapes the interpretation of VR log events.* Paper presented at the 2026 American Educational Research Association (AERA) Annual Meeting, Los Angeles, CA.
5. Zhang, S., Ganapathy, P. P., Earle-Randell, T. V., **Liu, Z**., Shi, Y., Bhat, S., & Israel, M. (2026, April). Analyzing High School Students' Code Comprehension and Strategies Using SOLO Taxonomy and Large Language Models. Poster presented at the Annual Meeting of the American Educational Research Association (AERA), Los Angeles, CA, United States.
6. **Liu, Z**., Ngo, B., & Xing, W. (2025). Evaluating AI-generated distractors in programming education: A human-AI collaborative approach [Poster Presentation]. In Proceedings of the 2025 ACM Conference on International Computing Education Research (ICER 2025). ACM.
7. **Liu, Z.,** Xing, W., Zhang, F., & Li, C**.** (2025, November). *Assessing creativity in music programming: Can AI automate the process?* Concurrent presentation at the AECT International Convention, Las Vegas, NV, United States.
8. Xing, W., **Liu, Z.**, & Zhang, F. (2025, November). *Enhancing spatial computational thinking in upper-elementary students through visual programming* [Poster presentation]. AECT International Convention, Las Vegas, NV, United States.
9. Jiang, Y., Fan, Y., & Liu, Z. (2026, January 3-7*). Generative artificial intelligence in art education: An overview of current research themes and future research directions* [Paper presentation]. The IAFOR International Conference on Education in Hawaii (IICE2026), Honolulu, HI, United States.
10. **Liu, Z**., Jiang, Y., Li, C., & Xing, W. (2025). Using supervised contrastive learning for improving individual fairness in AI online performance prediction. Presented at the 2025 American Educational Research Association (AERA) Annual Meeting, Denver, Colorado.
11. **Liu, Z.**, Song, Y., & Xing, W. (2025). Identifying factors of in-video dropout in middle school online math learning using survival analysis. Presented at the 2025 American Educational Research Association (AERA) Annual Meeting, Denver, Colorado.

12. Xing, W., **Liu, Z.**, & Song, Y. (2025). Teaching quantum computing to undergraduate students using a multimedia and simulation-based learning technology. Presented at the 2025 American Educational Research Association (AERA) Annual Meeting, Denver, Colorado.
13. Xing, W., Song, Y., Li, C., **Liu, Z**. (2025) Flipping the Roles: Engaging Middle School Students in Learning-by-teaching with a Generative AI-powered Teachable Agent. Presented at 2025 American Educational Research Association (AERA). Denver, Colorado.
14. Kim, T., Xing, W., **Liu, Z**., & Li, H. (2025). Investigating the Impact of Negative Emotions in High School Students' Asynchronous Online Math Discussions. Presented at the 2025 American Educational Research Association (AERA) Annual Meeting, Denver, Colorado.
15. **Liu, Z.**, Xing, W. , & Zhu, W.(2023). How AI assisted k-12 computer science education? A systematic review. [Symposium]. University of Notre Dame, US.
16. **Liu, Z.**, Xing, W. , & Zhu, W.(2023). Integrating Generative AI in Augmented Reality: A New Paradigm for Educational Resource Creation. [Symposium]. University of Notre Dame, US.
17. Oh, H., Guo, R., Xing, W., Song, Y., Li, C., **Liu, Z**. (2024, October 19-23). Integrating Machine Learning into High School Mathematics [Paper presentation]. Association for Educational Communications & Technology International Convention 2024, Kansas City, MO, United States.
18. Xing, W., **Liu, Z**., & Fang, Z. (2024,October 19-23). An exploratory study of mathematics teachers' discourse in an online lesson on polynomial expressions [Paper presentation]. Association for Educational Communications & Technology International Convention 2024, Kansas City, MO, United States.
19. Xing, W., **Liu, Z.**, & Song, Y. (2024,October 19-23). Understanding in-video dropout behavior: Analyzing student engagement in online math education [Paper presentation]. Association for Educational Communications & Technology International Convention 2024, Kansas City, MO, United States.
20. **Liu, Z.**, Song, Y., Xing, W., Guo, J., Feng, P., & Kim, G. (2024). Enhancing students' quantum computing learning through multimedia and simulation-based tools. Proposal submitted for presentation at the AECT International Convention, Kansas City, MO, October 19–23.
21. **Liu, Z.**, Jiang, Y., Li, C., & Xing, W. (2024, October 19–23). Improve individual fairness in online learning performance prediction [Paper presentation]. Association for Educational Communications & Technology International Convention 2024, Kansas City, MO, United States.
22. Fang, Z., Xing, W., & **Liu, Z**. (2024, December 4-7). Mathematics teachers' discourse in an online lesson on polynomial expressions. Presented at the Literacy Research Association's 74th Annual Conference, Westin Peachtree Plaza, Atlanta, GA, USA.
23. **Liu, Z**., Xing, W., Ray, S., & Owoputi, R. (2024, December 5–6). Enhancing automotive cybersecurity education in higher education through an immersive virtual environment [Poster presentation]. Warren B. Nelms Annual IoT Conference 2024, Gainesville, FL, United States.
24. Li, H., **Liu, Z**., & Xing, W. (2024, December 5–6). Leveraging secure IoT for intelligent multi-modal assessment in mathematics education [Poster presentation]. Warren B. Nelms Annual IoT Conference 2024, Gainesville, FL, United States.
25. **Liu, Z.**, Xing, W., Zhang, F., & Li, C. (2025, March). A visual programming approach to enhance spatial computational thinking skills in upper-elementary students [Poster presentation]. The 15th International Learning Analytics & Knowledge Conference, Dublin, Ireland.

Doctoral Symposium

1. *An Explainable Model for AI-Generated Pseudocode Detection in Online High School Programming Courses*, IEEE Frontiers in Education (FIE) 2024, Washington, D.C.
2. *Automatic Distractor and Feedback Generation in Online AI Education: A Design-Based Research Study*, ACM International Computing Education Research (ICER) 2025, Virginia