CHENGLU LI

Assistant Professor in Educational Technology

Google Scholar ◇ ResearchGate ◇ Personal Website

(+1)858-262-3323 ◇ chenglu.li@utah.edu

ACADEMIC APPOINTMENTS

University of Utah   Jul. 2023 - Present
Assistant Professor   *Salt Lake City, UT*

EDUCATION

University of Florida   Sept. 2020 - Aug. 2023
Ph.D. in Curriculum & Instruction   Gainesville, FL
Specialized in Educational Technology
Dissertation Title: ConCICE Support For Online Algebra I Learning: <u>Con</u>ceptual <u>C</u>hange Oriented Conversational Artificial <u>I</u>ntelligence Using Induction, <u>C</u>oncretization, and <u>E</u>xemplification (see the demo).
Committee: Wanli Xing, Walter Leite, Kara Dawson, Anthony Botelho

The University of Texas at Austin   Sept. 2015 - Aug. 2017
M.A. in Curriculum & Instruction   Austin, TX
Specialized in Learning Technologies

The University of International Business and Economics   Sept. 2011 - June 2015
B.A. in Business Vietnamese   Beijing, China

RESEARCH INTERESTS & SKILLS

Research Areas: Fair, Accountable, and Transparent (FAccT) AI in Education, Learning Analytics, Educational Data Mining, Computer Supported Collaborative Learning, Game-based Learning, Online Learning

Programming: JavaScript, Typescript, Python, R, Swift, Objective-C, C#, C++, & C

Front-end: React, React Native, Vue, Svelte, Ant-Design, TailWindUI, CharkraUI

Server-side: Express, NestJS, FastAPI, Flask, Django, MySQL, PostgreSQL, & MongoDB

Data Analysis: PyTorch, Tensorflow, Stan, Scikit-Learn, Pandas, NumPy, D3, SPSS, & SAS

RESEARCH PROJECTS

ALTER-Math: <u>A</u>I-augmented <u>L</u>earning by <u>T</u>eaching to <u>E</u>nhance and <u>R</u>enovate Math Learning   Oct. 2023 - Present
AI Engineering Lead   *Gainesville, FL*
· *$10M* funded by leading philanthropic foundations in educational technology.
· Serve as the technical lead, I lead a interdisciplinary team of researchers and experts in AI in education, large language models, and math education to develop an AI-powered teachable agent [demo].

- Lead classroom implementation studies and large-scaled AB testing with over four school districts, accumulating more than 1,500 participants.

Connecting STEM to Music and the Physics of Sound Waves

Feb. 2022 - Present

Key Personnel

Gainesville, FL

- Funded by *NSF, #1657366, $1,227,507*.
- Lead the design and development of a flow-based programming platform (M-Flow) aligned with standards to teach computing with music.
- Collaboratively conduct classroom studies to examine the effectiveness of M-Flow to teach computing.
- Participate in the development of curriculum and professional development sessions.

AI Cyberinfrastructure

Sept. 2020 - Present

Key Personnel

Gainesville, FL

- Funded by *Schmidt Family Foundation, University of Florida AI Catalyst Grant -P0195022, & the University of Florida Informatics Institute Seed Funding, totaling $600,000*.
- Lead the investigation and development of fair, accountable, and transparent (FAccT) AI cyberinfrastructure (e.g., reusable models, algorithms, and platforms) for education.
- Coordinate to organize a Kaggle Data Science Competition with Schmidt Family Foundation to further understandings on Fair Predictions.

Precision Education: The Virtual Learning Lab

Sept. 2020 - Dec. 2023

Researcher

Gainesville, FL

- Funded by *IES, #R305C160004, $8,908,288*.
- Lead studies on investigating and mitigating algorithmic bias for virtual learning environments (VLEs) in the context of Math Nation.
- Collaboratively conduct research to understand factors that influence teaching and learning in VLEs.

GRANT ACTIVITY

Funded Grants

1. *ALTER-Math: AI-augmented Learning by Teaching to Enhance and Renovate Math Learning*. Schmidt Futures Foundation, **PI**, $800,000. Oct. 2023 - Sept. 2027.

2. *ML4Math: Integrating Machine Learning and Mathematics Education Using a Concreteness Fading Approach* (awarded and finalizing), Office of Naval Research, **Co-PI**, total $600,000, my portion $100,000.

3. *Self-Regulation and Algebraic Problem-Solving Using AI: High School Students with Learning Disabilities*, University of Utah, **Co-PI**, $24,000.

Pending and Submitted Grants

1. *DELTA-Math: Diversified and Equitable Learning by Teaching AI for Math Learning*, NSF, **PI**, total $900,000, my portion $450,000.

2. *Developing and Evaluating an Avatar-Based Online Student Engagement Tool (ABO-SET) for Synchronous Video Conference Classes*, Spencer Foundation, **Co-PI**, $320,680, my portion $44,863.

3. *Suppor.ng integra.on in Dual Language Bilingual Educa.on programs through bilingual Scripts wriHen by Ar.ficial Intelligence (Project INTEGR-AI)*, University of Utah, **Co-PI**, $26,000.

Not funded

1. *AI-ELXR: AI-enabled Embodied Learning in Extended Reality*, IES, **Co-PI**, total $3,000,000, my portion $400,000.

2. *Developing CHAI: Support Algebra Learning with Computer-Enabled Conversations that Harness Artificial Intelligence*, IES, **Co-PI**, total $2,000,000, my portion $100,000.

PUBLICATIONS

Submitted Journal Articles

1. **Li, C.**, Xing, W., Song, Y., & Lyu, B. (in revision). RICE AlgebraBot: Lessons Learned from Designing and Developing Responsible Conversational AI using Induction, Concretization, and Exemplification to Support Algebra Learning. *International Journal of Artificial Intelligence in Education*.

2. Zhang, F., **Li, C.**, Henkel, O., Xing, W., Baral, S., Heffernan, N., & Li, H. (under review). Math-LLMs: AI Cyberinfrastructure with Pre-trained Transformers for Math Education. *International Journal of Artificial Intelligence in Education*.

3. Song, Y., **Li, C.**, Liu, Z., Xing, W., & Ma, Y. (under review, invited to submit for a special issue). Exploring Effective Tutoring Strategies in Asynchronous Online Mathematical Discussions: Insights from Ordered Network Analysis. *Journal of Science Education and Technology*.

4. Song, Y., **Li, C.**, Xing, W., & Ma, Y. (under review). Using Fair AI to Uncover the Behavioral Patterns of Self-regulated Learning in a Virtual Learning Environment. *Journal of Learning Analytics*.

5. Zhu, W., Xing, W., & **Li, C.** (under review, invited to submit for a special issue). Integrating Image-generative AI into Conceptual Design in CAD Education: Exploring Student Perceptions and Behaviors. *Educational Technology & Society*.

6. Li, H., Xing, W., **Li, C.**, & Zhu, W. (under review, invited to submit for a special issue). Exploring the Multi-Modality Bias Arising from Privacy Leakage in an Automatic Feedback System Enhanced by Generative Artificial Intelligence. *British Journal of Educational Technology*.

7. Li, H., Xing, W., **Li, C.**, & Zhu, W. (under review, invited to submit for a special issue). Integrating Generative AI in Math Education: Enhancing Feedback with Goal Orientation and Social Support. *Educational Technology & Society*.

8. Song, Y., Kim, J., Liu, Zi., **Li, C.**, & Xing, W. (under review). Students' Perceived Roles, Opportunities, and Challenges of an AI-powered Teachable Agent in Middle School Math Class. *Education and Information Technologies*.

Refereed Journal Articles

1. Song, S., Xing, W., **Li, C.**, Tian, X., & Ma, Y. (2024, accepted). Investigating the Relationship between Math Literacy and Linguistic Synchrony in Mathematical Discussions through Large Scale Data Analytics. *British Journal of Educational Technology* [Impact Factor: 6.6]

2. Xing, W., Huang, X., **Li, C.**, & Xie, C. (2023). Teaching thermodynamics with augmented interaction and learning analytics. *Computers & Education, 19*, Article 104726. https://doi.org/10.1016/j.compedu.2023.104726 [Impact Factor: 11.182]

3. **Li, C.**, Xing, W., & Leite, W. (2022). Building Socially Responsible Conversational Agents Using Big Data to Support Online Learning: A Case with Algebra Nation. *British Journal of Educational Technology, 53*(4), 776–803. https://doi.org/10.1111/bjet.13227 [Impact Factor: 5.268]

4. **Li, C.**, Xing, W., & Leite, W. (2022). Toward Building a Fair Peer Recommender to Support Help-Seeking in Online Learning. *Distance Education, 43*(1), 30–55. https://doi.org/10.1080/01587919.2021.2020619 [Impact Factor: 5.500]

5. **Li, C.**, Xing, W., & Leite, W. (2022). Using Fair AI to Predict Students' Math Learning Outcomes in an Online Learning Platform. *Interactive Learning Environments*. https://doi.org/10.1080/10494820.2022.2115076. [Impact Factor: 4.965]

6. **Li, C.** & Xing, W. (2021). Natural Language Generation Using Deep Learning to Support MOOC Learners. *International Journal of Artificial Intelligence in Education, 31*(2), 186–214. https://doi.org/10.1007/s40593-020-00235-x [Flagship Journal of International AIED Society]

7. Xie, C., **Li, C.**, Huang, X., Sung, S., & Jiang, R. (2022). Engaging Students in Distance Learning of Science with Remote Labs 2.0. *IEEE Transactions on Learning Technologies*. https://doi.org/10.1109/TLT.2022.3153005 [Impact Factor: 4.433]

8. Liu, M., **Li, C.**, & Pan, Z. (2022). Creating an Interactive Dashboard to Support Middle School Teachers' Implementation of a Technology-Supported Problem-Based Learning Program. *International Journal of Designs for Learning, 13*(1), 1-18. https://doi.org/10.14434/ijdl.v13i1.31243

9. Leite, W., Xing, W., Gail, G., & **Li, C.** (2022). Teacher Strategies to Use Virtual Learning Environments to Facilitate Algebra Learning During School Closures. *Journal of Research on Technology in Education*. https://doi.org/10.1080/15391523.2022.2110335 [Impact Factor: 3.281]

10. Jiang, R., Ding, X., Sung, S., Bulseco, D., Xie, C., & **Li, C.** (2022). A New Type of Interactive Video for Physics Education. *The Physics Teacher*.

11. Xie, C., **Li, C.**, Ding, X., Jiang, R., & Sung, S. (2021). Chemistry on the Cloud: From Wet Labs to Web Labs. *Journal of Chemistry Education, 98*(9), 2840–2847. https://doi.org/10.1021/acs.jchemed.1c00585 [Impact Factor: 2.979]

12. Jiang, R., **Li, C.**, Huang, X., Sung, S., & Xie, C. (2021). Remote Labs 2.0 to the Rescue: Doing Science in a Pandemic. *The Science Teacher, 88*(6), 63–71. Document URL

13. Liu, M., Pan, Z., **Li, C.**, Han, S., Shi, Y., & Pan, X. (2021). Using Learning Analytics to Support Teaching and Learning in Higher Education: A Systematic Focused Review of

Journal Publications from 2016 to Present. *International Journal on E-Learning, 20*(2), 137–169. https://www.learntechlib.org/primary/p/218801/

14. Pan, Z., Lopez, M., **Li, C.**., & Liu, M. (2021). Introducing augmented reality in early childhood literacy learning. *Research in Learning Technology, 29*, Article 2539. https://doi.org/10.25304/rlt.v29.2539 [Scopus CiteScore: 4.8]

15. Sung, S., **Li, C.**, Huang X., & Xie, C. (2021). Enhancing Distance Learning of Science: Impact of Scalable Remote Laboratories on Students' Behavioral and Cognitive Engagement. *Journal of Computer Assisted Learning, 37*(6), 1606–1621. https://doi.org/10.1111/jcal.12600 [Impact Factor: 2.126]

16. Xing, W., **Li, C.**, Chen, G., Huang, X., Massicotte, J., & Xie, C. (2020). Automatic Assessment of Students' Engineering Design Performance using a Bayesian Network Model. *Journal of Educational Computing Research, 59*(2), 230–256. https://doi.org/10.1177/0735633120960422 [Impact Factor: 2.180]

17. Sung, S., **Li, C.**, Xie, C., Huang, X., & Shen, J. (2020). How Does Augmented Observation Facilitate Multimodal Representational Thinking? Applying Deep Learning to Decode Complex Student Construct. *Journal of Science Education and Technology, 30*(2), 210–226. https://doi.org/10.1007/s10956-020-09856-2 [Impact Factor: 2.218]

18. Zou, W., Hu, X., Pan, Z., **Li, C.**, Cai Y., & Liu, M. (2020). Exploring the relationship between social presence and learners' prestige in MOOC discussion forums using automated content analysis and social network analysis. *Computers in Human Behavior, Article 115*, Article 106582. https://doi.org/10.1016/j.chb.2020.106582 [Impact Factor: 4.306]

19. Liu, M., Shi, Y., Pan, Z., **Li, C.**, Pan, X., & Lopez, F. (2020). Examining middle school teachers' implementation of a technology-enriched problem-based learning program: Motivational factors, challenges, and strategies. *Journal of Research on Technology in Education, 53*(3), 279–295. https://doi.org/10.1080/15391523.2020.1768183 [Impact Factor: 1.585]

20. Liu, M., **Li, C.**, Pan, Z., & Pan X. (2019). Mining Big Data to Help Make Informed Decisions for Designing Effective Learning Environments. *Interactive Learning Environments*, 1–21. https://doi.org/10.1080/10494820.2019.1639061 [Impact Factor: 1.604]

21. Liu, M., Zou, W., Shi, Y., Pan, Z., & **Li, C.** (2019). What Do Participants Think of Today's MOOCs: An Updated Look at the Benefits and Challenges of MOOCs Designed for Working Professionals. *Journal of Computing in Higher Education, 32*(2), 307–329. https://doi.org/10.1007/s12528-019-09234-x [Impact Factor: 1.870]

22. Liu, M., Liu, S., Zou, W., Pan, Z., & **Li, C.** (2018). Examining Science Learning and Attitudes by At-Risk Students After They Used a Multimedia-Enhanced Problem-Based Learning Environment. *Interdisciplinary Journal of Problem-Based Learning. 13*(1). https://doi.org/10.7771/1541-5015.1752 [Scopus CiteScore: 3.3]

Competitive Refereed Conference Papers

* indicates graduate or post-doctoral advisees

1. Lyu, B.*, **Li, C.**, Li, H., & Xing, W. (under review). Influences of Joining Time and Social Interactions on Sustaining Students' Participation in an Online Mathematics Discussion Board.

2024 ACM Learning @ Scale Conference.

2. Li, H., Xing, W., **Li, C.**, & Zhu, W. (under review). Unraveling Positive Affective Feedback Mechanisms in Mathematics Teaching: Utilizing Multimodal Data Mining and Explainable Analysis to Develop a Scaffolding Tool. *2024 ACM Learning @ Scale Conference.*

3. Li, H., Guo, R., **Li, C.**, & Xing, W. (under review). Automated Quality Assessment of Multimodal Mathematical Stories Generated by Generative Artificial Intelligence: Text-Image Coherence and Grade Level Appropriateness. *2024 ACM Learning @ Scale Conference.*

4. Henkel, O., Levonian, Z., **Li, C.**, & Postle, M. (under review). Retrieval-augmented Generation to Improve Math Question-Answering: Trade-offs Between Groundedness and Human Preference. *Educational Data Mining 2024.*

5. Liu, Z., Jiao, X., Zhang, S., Jiang, S., **Li, C.**, & Xing, W. (under review). Predicting Changes in Students' Performance Using Online Learning Behavior Data and Group Fairness. *Educational Data Mining 2024.*

6. **Li, C.**, Zhu, W., & Xing, W. (accepted, 2024). Analyzing Student Attention and Acceptance of Conversational AI for Math Learning: Insights from a Randomized Controlled Trial. *LAK'24: the 14th International Conference on Learning Analytics and Knowledge* [≈30% acceptance rate]

7. Song, Y., **Li, C.**, Xing, W., Li, S., & Lee, H. (accepted, 2024). Enhancing Large Language Models for Mathematics Education: Leveraging Large Datasets and Task-Specific Pre-training. *LAK'24: the 14th International Conference on Learning Analytics and Knowledge* (Mentoring role) [≈30% acceptance rate]

8. Li, H., **Li, C.**, Xing, W., Baral, S., & Heffernan, N. (accepted, 2024). Automated Feedback for Student Math Responses Based on Multi-Modality and Fine-Tuning. *LAK'24: the 14th International Conference on Learning Analytics and Knowledge* (Mentoring role) [≈30% acceptance rate]

9. Zhu, W., **Li, C.**, Zhu, G., Li, Y., & Xing, W. (accepted, 2024). iSEA: Instructor-in-the-loop Student Engagement Analytics via FAccT AI. *International Society of the Learning Sciences Annual Meeting.*

10. Zhang, F., Xing, W., &, **Li, C.** (2023). Predicting Students' Algebra I Performance using Reinforcement Learning with Multi-Group Fairness. *LAK'23: the 13th International Conference on Learning Analytics and Knowledge* (Mentoring role) https://doi.org/10.1145/3576050.3576104 [≈30% acceptance rate].

11. Song, Y., Xing, W., Tian, X., &, **Li, C.** (2023). Are We on the Same Page? Modeling Linguistic Synchrony and Math Literacy in Mathematical Discussions. *LAK'23: the 13th International Conference on Learning Analytics and Knowledge* (Mentoring role) https://doi.org/10.1145/3576050.3576082 [≈30% acceptance rate] [Best Short Paper Award].

12. Song, Y., Xing, W., Barron, A., Oh, H., **Li, C.** & Minces, V. (2023). M-flow: a Flow-based Music Creation Platform Improves Underrepresented Children's Attitudes toward Computer Programming. *IDC '23: Proceedings of the 22nd Annual ACM Interaction Design and Children Conference.* https://doi.org/10.1145/3585088.3589383

13. Minces, V., Xing, W., & **Li, C.** (2023). Work in Progress: Mflow, a Flow-based Music Programming Platform for Young Children. Proceedings of 2023 IEEE World Engineering Education Conference (EDUNINE). https://doi.org/10.1109/EDUNINE57531.2023.10102852

14. Xing, W., **Li, C.**, & Leite, W. (2022). AlgebraNation Dataset: Educational Big Data to Support Fair Educational Machine Learning. *Proceedings of the Educational Data Mining (EDM) 2022 Fairness, Accountability, and Transparency in Educational Data Workshop*. EDM. View Paper.

15. **Li, C.**, Xing, W. & Leite, W. (2022). Do Gender and Race Matter? Supporting Help-Seeking with Fair Peer Recommenders in an Online Algebra Learning Platform. *Proceedings of the 12th International Conference on Learning Analytics and Knowledge - LAK'22* (pp. 432–437). ACM. https://doi.org/10.1145/3506860.3506869 [≈30% acceptance rate]

16. **Li, C.** & Xing, W. (2022). Revealing Factors Influencing Students' Perceived Fairness: A Case with a Predictive System for Math Learning. *Proceedings of 2022 ACM Conference on Learning at Scale - L@S'22*. ACM. https://doi.org/10.1145/3491140.3528293 [≈30% acceptance rate]

17. **Li, C.**, Xing, W. & Leite, W. (2021). Yet Another Predictive Model? Fair Predictions of Students' Learning Outcomes in an Online Math Learning Platform. *Proceedings of the 11th International Conference on Learning Analytics and Knowledge - LAK'21* (pp. 572–578). ACM. https://doi.org/10.1145/3448139.3448200 [≈30% acceptance rate]

18. **Li, C.**, Xing, W. & Leite, W. (2021). Using Fair AI with Debiased Network Embeddings to Support Help Seeking in an Online Math Learning Platform. In I. Roll, D. McNamara, S. Sosnovsky, R. Luckin, & V. Dimitrova (Eds.), *Artificial Intelligence in Education. AIED 2021. Lecture Notes in Computer Science, vol 12749* (pp. 245–250). Springer. https://doi.org/10.1007/978-3-030-78270-2_44 [≈30% acceptance rate]

19. Zou, W., Pan, Z., **Li, C.**, & Liu, M. (2021). Does Social Presence Play a Role in Learners' Positions in MOOC Learner Network? A Machine Learning Approach to Analyze Social Presence in Discussion Forums. In *International Conference on Quantitative Ethnography* (pp. 248–264). Springer, Cham. https://doi.org/10.1007/978-3-030-67788-6_17

20. Pan, Z., **Li, C.**, & Liu, M. (2020). Learning Analytics Dashboard for Problem-based Learning. In *Proceedings of the Seventh ACM Conference on Learning@Scale* (pp. 393–396). ACM. https://doi.org/10.1145/3386527.3406751 [≈30% acceptance rate]

Book Chapters

1. Xing, W., & **Li, C.** (in press). Fair Artificial Intelligence to Support STEM Education: A Hitchhiker's Guide. In J. Krajcik & X. Zhai (Eds.), *Uses of Artificial Intelligence in STEM Education*. Oxford University Press.

2. Pan, Z., & **Li, C.** (2023). Applying Learning Analytics Approaches to Detect and Track Students' Cognitive States During Virtual Problem-Solving Activities. In G. Durak & S. Cankaya (Eds.), *Perspectives on Learning Analytics for Maximizing Student Outcomes*. IGI Global. https://doi.org/10.4018/978-1-6684-9527-8.ch002

3. Liu, M., Zou, W., **Li, C.**, Shi, Y., Pan, Z., & Pan, X. (2019). Using Learning Analytics to Examine Relationships Between Learners' Usage Data with Their Profiles and Perceptions: A Case Study of a MOOC Designed for Working Professionals. In D. Ifenthaler, D. Mah, and J. Y. Yau (Eds.), *Utilizing Learning Analytics to Support Study Success* (pp. 275–294). New York: Springer International Publishing. https://doi.org/10.1007/978-3-319-64792-0_15

4. Liu, M., Horton, L., **Li, C.**, & Pan, Z. (2019). Alien Rescue. In K. Schrier (Ed.), *Learning, Education, & Games: 100 Games to Use in the Classroom and Beyond, Vol. III* (pp. 23–27). ETC Press (Carnegie Mellon).

5. Liu, M., Pan, Z., Pan, X., Dong, A., Zou, W., **Li, C.**, & Shi, Y. (2018). The Use of Analytics for Educational Purposes: A Review of Literature From 2015 to Present. In M. S. Khine (Ed.), *Emerging trends in learning analytics* (pp. 26-44). Brill. https://doi.org/10.1163/9789004399273_003

RESEARCH PRESENTATIONS

Refereed Conference Presentations

1. **Li, C.**, Xing, W., & Leite, W. (2023, April 13–16). *Enhancing the Safety of Conversational Artificial Intelligence to Support Online Learning Using Educational Big Data* [Poster presentation]. American Educational Research Association 2023 Annual Meeting, Chicago, IL, United States.

2. Lin, S., Pringle Z., Cipriano, C., **Li, C.**, Wood, M., & Brackett, M. (2023, April 13–16). *Mixed Affect Among Educators During the COVID-19 Pandemic: A Network Analysis* [Research presentation]. American Educational Research Association 2023 Annual Meeting, Chicago, IL, United States.

3. **Li C.**, & Xing, W. (2023, October 16–20). *Investigating Social Support Dynamics of Online Math Learning Using Core-Periphery-xPeriphery Structures* [Research presentation]. Association for Educational Communications & Technology International Convention, Orlando, FL, United States.

4. Xing, W., & **Li C.** (2023, October 16–20). *Is Early Participation Rewarding? Examining Factors Influencing Students' Online learning Performance at a Large Scale* [Research presentation]. Association for Educational Communications & Technology International Convention, Orlando, FL, United States.

5. Song, Y., Xing, W., Barron, A., Oh, H., **Li, C.**, & Minces, V. (2023, October 16–20). *Unlocking the Potential of Coding Music for Young Students through M-flow Platform* [Research presentation]. Association for Educational Communications & Technology International Convention, Orlando, FL, United States.

6. Zhang, F., Xing, W., & **Li, C.** (2023, October 16–20). *Using Reinforcement Learning with Multi-Group Fairness to Predict Students' Algebra I Performance* [Workshop]. Association for Educational Communications & Technology International Convention, Orlando, FL, United States.

7. Zou, W., Pan, Z., **Li, C.**, & Yang, Y. (2023, October 16–20). *Mathmagician: Co-creating an AI-based Culturally Responsive Math Word Problem Generator with Educators and Learners* [Poster presentation]. Association for Educational Communications & Technology International Convention, Orlando, FL, United States.

8. **Li, C.**, & Xing, W., & Leite, W. (2022, April 21–26). *Toward Fairly Predicting Students' Math Learning Outcomes in an Online Platform* [Poster presentation]. American Educational Research Association (AERA) 2022 Conference, San Diego, CA, United States.

9. **Li, C.**, & Xing, W. (2022, April 21–26). *Engaging MOOC Students With Social-Emotional Support by Using Conversational Artificial Intelligence With Deep Learning* [Poster presentation]. American Educational Research Association (AERA) 2022 Conference, San Diego, CA, United States.

10. Pan, Z., Song, H., Cai, Y., Shao, P., **Li, C.**, Liu, M. (2022, April 21–26). *The Role of a Learning Analytics Scaffolding System in Middle School Science Problem-Based Learning Activities* [Paper presentation]. American Educational Research Association (AERA) 2022 Conference, San Diego, CA, United States.

11. **Li, C.**, Xing, W. & Leite, W. (2021, November 2–6). *Time for a Paradigm Shift in Predictive Analytics: Debiasing Models with Fair AI* [Paper presentation]. Association for Educational Communications and Technology (AECT) 2021 Conference, Online.

12. **Li, C.** & Xing, W. (2021, November 2–6). *Using Conversational AI with deep learning to support MOOC learners* [Paper presentation]. Association for Educational Communications and Technology (AECT) 2021 Conference, Online.

13. **Li, C.**, Xing, W. & Leite, W. (2021, November 2–6). *Building a Network-based Recommender System Using Fair AI to Support Help Seeking in Online Learning* [Poster presentation]. Association for Educational Communications and Technology (AECT) 2021 Conference, Online.

14. Pan, Z., **Li, C.**, Zou, W., & Liu, M. (2021, April 8–12). *The development of an automatic text classifier enhanced dashboard in supporting teacher's facilitation of virtual problem-based learning activities* [Roundtable presentation]. American Educational Research Association (AERA) 2021 Conference, Online.

15. Liu, M., **Li, C.**, & Pan, Z. (2021, April 8–12). *Using Learning Analytics to Understand How to Design Effective Digital Educational Games* [Paper presentation]. American Educational Research Association (AERA) 2021 Conference, Online.

16. Cheah, Y. H., **Li, C.**, & Hughes, J. E. (2020, canceled). *The Relationship between U.S. Students' Technology Access and Use and Their Science Achievement* [Paper presentation]. American Educational Research Association (AERA) 2020 Conference, San Francisco, CA, United States.

17. Liu, M., Zou W., **Li, C.**, Shi, Y., Pan, Z., & Pan, X. (2020, canceled). *Examining Relationships Between MOOC Participants' Usage Data and Their Profiles Through Learning Analytics* [Paper presentation]. American Educational Research Association (AERA) 2020 Conference, San Francisco, CA, United States.

18. Zou, W., Shi, Y., **Li, C.**, & Liu, M. (2020, canceled). *Examining learners' social presence in relation to their engagement in social interactions in MOOC forums* [Paper presentation]. American Educational Research Association (AERA) 2020 Conference, San Francisco, CA, United States.

19. Liu M., Shi, Y., Pan, Z., **Li, C.**, Pan, X. & Lopez, F. M. (2020, canceled). *What Motivates Middle School Teachers to Adopt A Technology-Enriched Problem-Based Learning Program in Their Classrooms* [Paper presentation]. American Educational Research Association (AERA) 2020 Conference, San Francisco, CA, United States.

20. **Li, C.**, Hsu, H.P., Hughes, J. E., & Zou, W. (2019, October 21–25). *How Computer-assisted Data Triangulation Influences Graduate Students' Learning Experience and Outcomes of Qualitative Data Analysis?* [Poster presentation]. Association for Educational Communications and

Technology (AECT) 2019 Conference, Las Vegas, NV, United States.

21. Liu, M., Liu, S., Pan Z., Zou, W., & **Li, C.** (2019, November 4–7). *Can Using a Multimedia-Enriched Problem-Based Learning Environment Improve At-Risk Students' Attitude* [Paper presentation]. Association for the Advancement of Computing in Education (E-Learn) 2019 Conference, New Orleans, LO, United States.

22. Zou, W., **Li, C.**, & Jie, L. (2019, May 23). *How Does Participation in MOOC Discussion Forum Affect Achievement - An Analysis of Students' Social Presence and Achievement Emotions in Relation to Their Completion Status* [Paper presentation]. Learning Analytics in Asia (LAASIAN) 2019 Symposium, Hongkong, China.

23. Liu, M., Zou, W., Shi, Y., Pan, Z. & **Li, C.** (2019, April 5–9). *What Do Participants Think of Today's MOOCs Designed for Working Professionals* [Paper presentation]. American Educational Research Association (AERA) 2019 Conference, Toronto, Canada.

24. Liu, S., Liu, M., Pan Z., Zou, W., & **Li, C.** (2019, March 4–8). *Examining Science Learning by At-Risk Middle School Students in a Multimedia-Enriched Problem-Based Learning Environment* [Poster presentation]. International Learning Analytics and Knowledge (LAK) 2019 Conference, Tempe, AZ, United States.

25. Liu, M., Pan, Z., Pan, X., An, D., Zou, W., **Li, C.** & Shi, Y. (2018, October 15–18). *The Use of Analytics for Educational Purposes: A Review of Literature From 2015 to Present* [Paper presentation]. Association for the Advancement of Computing in Education (E-Learn) 2018 Conference, Las Vegas, NV, United States.

26. Liu, M., **Li, C.**, & Pan, Z. (2018, June 25–29). *Alien Rescue: A 3D Problem-Based Learning Game*. 2018 World Conference on Educational Media and Technology (EdMedia), Amsterdam, Netherlands.

27. **Li, C.**, & Pan, Z. (2018, October 23–27). *A Machine Learning incorporated qualitative data analysis method*. Association for Educational Communications and Technology (AECT) 2018 Conference, Kansas City, MO, United States.

Invited Talks & Workshops

1. **Li, C.**. (2024, Jan.). *Introduction to Generative AI & Educational Research*. Guest Speaker at Dr. Walter Leite's Class (University of Florida). Gainesville, FL. https://fated2022.github.io/acceptedpapers/

2. **Li, C.**. (2023, Nov.). *Computational Thinking in the Era of Generative Artificial Intelligence for K-12 Educators*. Guest Speaker at Dr. Cheah Yon-Hong's Class (University of Idaho). Moscow, ID. https://fated2022.github.io/acceptedpapers/

3. **Li, C.**, Xing, W., & Leite, W. (2022, Jul.). *Encore Paper: Building socially responsible conversational agents using big data to support online learning: A case with Algebra Nation*. FATED 2022. Durham, UK. https://fated2022.github.io/acceptedpapers/

4. **Li, C.** (2021, May). *Fair AI in VLEs*. IES 2021 ED Games Expo. University of Florda, Gainesville, Florida. https://ies.ed.gov/blogs/research/post/highlighting-the-science-of-learning-at-the-2021-ed-games-expo

5. **Li, C.**, Xing, W., & Leite, W. (2021, Feb.). *Predicting Students' Learning Outcomes Using Fair AI in Online Math Learning*. AAAI 2021 Workshop on AI Education. Online. https:

//sites.google.com/view/tipce-2021#h.hxwg96b2wwkf

TEACHING EXPERIENCE

F2F: face-to-face teaching

EDPS 7440 (Hybrid), Learning Sciences Seminar (Utah)   Aug. 2023 - Current
Instructor   *Salt Lake City, UT*

· Organized academic and industrial guest speaker events
· Deliver instructions on learning sciences foundations.
· Advised on students' research presentations.

EDPS 6560 (Hybrid), Multimedia Learning (Utah)   Jan. 2024 - Current
Instructor   *Salt Lake City, UT*

· Recorded instructional tutorials for students: https://youtu.be/GlQ_v2Sc1h4
· Deliver instructions on HTML & CSS, Photoshop, Premiere Pro, and Illustrator.
· Host Q&A sessions.

EDG6931 (F2F), Artificial Intelligence and Education (UF)   Aug. 2022 - Dec. 2022
Teaching Assistant   *Gainesville, FL*

· Recorded instructional tutorials for students: https://www.youtube.com/playlist?list=PL8aO98WwqzJbQI759V9O7EdL8t7YirelP
· Deliver instructions on intelligent tutoring systems and conversational AI.
· Design the final project of using AI tools to build conversational AI for education.
· Host Q&A sessions on DialogFlow and Rasa for students.

EDF3935 (Hybrid), Fairness & Equity in AI for Education (UF)   Jan. 2022 - April 2022
Co-instructor   *Gainesville, FL*

· Mentored undergraduate students in computer science for fair AI projects.
· Delivered instructions on introductory machine learning and fair AI techniques.
· Hosted Q&A sessions on Python for students.
· Example students' deliverable: Click to view

EME6651 (Hybrid), Learning Analytics & Concepts (UF)   Sept. 2020 - May 2022 (Three offerings)
Teaching Assistant   *Gainesville, FL*

· Recorded instructional tutorials for students: https://bit.ly/3xBxppB
· Assisted the instructor with designing curriculum, delivering lectures, and grading.
· Hosted Q&A sessions on Learning Analytics & RapidMiner for students.

PROFESSIONAL EXPERIENCE

Concord Consortium   Jun. 2019 - Aug. 2019
R & D Intern   *Concord, MA*

· Independently developed iOS version of Infrared Explorer (NSF-funded).
· Implemented computer vision and graph algorithms in the application such as Marching Squares and A*.

· Project: https://intofuture.org/ie.html

Neuf   Jul. 2017 - Aug. 2021
Co-founder & Software Engineer   *Austin, TX*
· Built both iOS and Android clients with React Native independently.
· Collaborated on building computer vision models (e.g., FastRCNN, Vision Transformers) for fashion products recommendation system. Used Tensorflow and Keras.
· Project: https://web.archive.org/web/20210421011527/https://apps.apple.com/us/app/neuf-shop-brands-you-love/id1415390829

Ericsson   Sept. 2017 - Feb. 2018
Learning Analytics Researcher   *Austin, TX*
· Analyzed training data on employees of sales department quantitatively and qualitatively.
· Researched on factors that contributed to students' learning satisfaction by building a tree-based model.
· Understood how to improve students' learning satisfaction and results by extracting important features from statistical models.

Amne   Jan. 2017 - April. 2017
Full-stack Developer   *Austin, TX*
· Independently implemented the front-end architecture of the company's webapp using React.JS.
· Discussed design and implementation of APIs with backend developers.

PalmDrive Inc.   Jun. 2016 - Sept. 2016
Mobile Development Engineer   *Cupertino, CA*
· Independently implemented UI design of five minor versions, from 2.2 to 2.6 by using Apple's native APIs such as AVFoundation, UICollectionView, UITableView, CAAnimation and CoreGraphics.
· Wrote download service utility class by using Alamofire, NSOperation and etc.
· Applied deep linking to the app with Branch.io's SDK.
· Participated in code architecture(OOP), data modeling(CoreData) and API design(Node.js).
· Project: http://xiaobandeng.palmdrive.cn/

Perfect World   Nov. 2014 - Mar. 2015
Overseas Marketing Intern   *Beijing, China*
· Analyzed operation data (e.g., engagement index, conversion rate) of MMORPG games in Vietnam with Excel and Python.
· Analyzed user behaviors through log and transaction data to enhance the retention and pay rate .
· Collaborated with the marketing group of South-East Asia to come up with A/B tests based on the analysis.

General Electric   Jul. 2014 - Sept. 2014
Summer Accounting Intern of Global Operations-Finance (GOF)   *Shanghai, China*
· Participated in regular training held by GE, including lean start-up and communication skills.

- Developed computer vision models and browser scripts to automatically index invoices to Webex.
- Localized tax-reporting software in Vietnamese through XML.

HONORS & AWARDS

IDC'23 Best Short Paper Award	Jun. 2023
LAK'23 Best Short Paper Award	Mar. 2023
LAK'23 Doctoral Consortium	Mar. 2023
AECT Early Career Symposium	Oct. 2022
LAK'22 Best Short Paper Nomination	Mar. 2022
AECT Research and Theory Division Featured Research	Nov. 2020
College of Education Fellowship (UF) [$\approx \$110,000$]	Sept. 2020 - Sept. 2024
College of Education Scholarship (UT Austin) [$\approx \$8,000$]	Sept. 2019 - Sept. 2020
New Doctoral Student Fellowship (UT Austin) [$\approx \$32,000$]	Sept. 2017 - Sept. 2019
ISSS Financial Aid for International Students (UT Austin)	Sept. 2016 - Sept. 2017
Dean's Scholarship (UIBE) [First 10% Rank]	2012, 2013, & 2014

AI CYBERINFRASTRUCTURE & SOFTWARE

Computational Models

1. MathRoBERTa Cyberinfrastructure trained with 8 Nvidia GPUs and over 3,000,000 math discussion posts by students and facilitators on Algebra Nation.

2. SafeMathBot Cyberinfrastructure trained with 8 Nvidia GPUs and enhanced with conversation safety policies (e.g., threat, profanity, identity attack).

3. Fair-LR Python Model: create a fairness-enhanced logistic regression (Fair-LR) model of prediction based on Seldonian Framework.

4. Fair-NE Python Model: construct a fair peer recommender using network embeddings.

Selected Web & Mobile Apps

1. My dissertation ConvAI: A reusable server cyberinfrastructure to construct a algebra ConvAI that allows open-domain conversations.

2. Telelab: Telelab approximates real-world observation and laboratory experiences in an online environment.

3. M-Flow: A flow-based programming platform that connects computing education with music creation.

4. Alien Rescue Teacher Dashboard: A learning analytics dashboard for teachers using Alien Rescue. Functionalities are highly modular and can be migrated to other educational programs with log data.

5. MVivo: A project that intends to become an alternative of NVivo for qualitative researchers, powered by trendy NLP techniques (demo).

6. Neuf: A computer vision AI in the "disguise" of a mobile shopping app.

7. Infrared Explorer iOS: The iOS version of Infrared Explorer, which is later ported to serve as the engine of Telelab.

Selected LMS Extensions

Most of the extensions are implemented as learning tools interoperability (LTI), which is a protocol universally used by LMS such as Canvas and Blackboard. These tools can be integrated in LMS as a tab in course navigation bar and students can be authenticated seamlessly with their LMS logins.

1. IMS-LTI: Infrastructure package to streamline LTI integration with organizational Canvas instances (e.g., university).

2. Fitbit LTI (created for the Kinesiology department@UT): A analytics and social networking dashboard integrated in Canvas that allows instructors and students to view their Fitbit statistics and receive intervention emails.

3. Canvas quiz automator: A browser automation that automatically populates quizzes in Canvas using custom-defined formats (e.g., CSV).

Open Source Contributions

Zustand (#830), Thunkable (#1016), Expo (#2061, #2104), Canvas LMS (#1183).

PROFESSIONAL SERVICE

- Ad hoc Reviewer, The Internet and Higher Education, 2023

- Ad hoc Reviewer, British Journal of Educational Technology, 2022 - 2023

- Ad hoc Reviewer, International Journal of Artificial Intelligence in Education, 2023

- Ad hoc Reviewer, IEEE Transactions on Learning Technologies, 2023

- Ad hoc Reviewer, Journal of Research on Technology in Education, 2023

- Ad hoc Reviewer, Journal of Computers in Education, 2023

- Ad hoc Reviewer, Education Sciences, 2023

- Program Committee, LAK'23: International Conference on Learning Analytics & Knowledge, 2022-2024

- Reviewer, AECT Conference, 2019 & 2021

PROFESSIONAL AFFILIATIONS

- Society for Learning Analytics Research (SoLAR)
- International AIED Society
- International Educational Data Mining Society
- Association for Computing Machinery (ACM)
- Institute for Electrical and Electronics Engineers (IEEE)
- American Educational Research Association (AERA)
- Association for Educational Communications and Technology (AECT)