Yang Jiang

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Google Scholar

Research Interests

Big Data in Education; Artificial Intelligence; Learning Analytics; Educational Data Mining; Learner Modeling; Educational Technology; Cognitive Psychology; Educational Assessments; Complex Skills; Large Language Models

Education

Columbia University, Teachers College, New York, NY 2013-2018
Ph.D. in Cognitive Science in Education. **Overall GPA: 4.00/4.00.**
Concentration: Intelligent Technologies and Learning Analytics.
Advisor: Ryan Baker, John Black.
Dissertation: Jiang, Y. (2018). *Development of Self-Regulated Learning Skills Within Open-Ended Computer-Based Learning Environments for Science*. (Doctoral dissertation, Columbia University).
Dissertation Committee: Ryan Baker, John Black, Jody Clarke-Midura, Stephen Peverly, Bryan Keller.

Columbia University, Teachers College, New York, NY 2015-2017
M.S. in Applied Statistics. **Overall GPA: 4.00/4.00.**

Harvard University, Graduate School of Education, Cambridge, MA 2010-2011
Ed.M. (Master's) in Technology, Innovation, and Education. **Overall GPA: 4.00/4.00.**

Shanghai International Studies University, Shanghai, China 2006-2010
B.A. in Journalism and Communication. **Overall GPA: 3.88/4.00**

Employment / Positions

Educational Testing Service, Princeton, NJ
Research Scientist, Data Science, ETS Research Institute 2021-present
Associate Research Scientist, Data Science 2018-2021
Consultant, Research & Development 2017-2018

University of Pennsylvania, Philadelphia, PA 2025-present
Adjunct Professor

Teachers College Columbia University, New York, NY 2013-2018
Graduate Researcher

Cheng & Tsui, Boston, MA 2012-2013
Digital Products Analyst

Pioneer Valley Chinese Immersion Charter School, Hadley, MA 2011-2012
Mathematics and Chinese Immersion Teacher

Harvard University, Cambridge, MA 2010-2011
Graduate Research Assistant, Graduate School of Education

Xinhua News Agency Shanghai Branch, Shanghai, China 2009
Intern, Audio and Video Bureau

Awards and Honors

- Alumni Council Award for Impact in Education. Harvard Graduate School of Education. 2025.
- Best Poster Presentation Award. The 10th Annual Research and Scholarship Showcase. 2022.
- Presidential Award. Educational Testing Service. 2021.
- Top Cited Article 2020-2021. Wiley. 2021.
- SPOT Award. Educational Testing Service. 2019.
- Best Student Paper Award. Best Paper Award Nomination. Artificial Intelligence in Education (AIED). 2018.
- Teachers College Doctoral Fellowship. 2014-2018.
- Student Scholarship. The National Science Foundation (NSF) Big Data PI Meeting. Washington, DC. 2017.
- Kuo Ping Wen Scholarship. 2014-2016.
- Susan A. and Robert S. Diamond Scholarship. 2014-2015.
- Ben Woods Fellowship. 2013-2014.
- SISU Academic Excellence Scholarship. 2006-2010.

Research Grants

Select Externally Funded Research Projects

2024-2027 **Funding Source:** U.S. Department of Education, Education Innovation and Research (EIR) program
Role: Co-Investigator
Project: Developing Middle School Students' Social Emotional Learning Skill Applications through Technology Enhanced Collaborative Learning (S411C230179)

Corresponding PI: Patrick Kyllonen (PI), Stephen N. Elliott (Co-PI), Jiangang Hao (Co-PI), Jessica Andrews Todd (Co-PI), Yang Jiang (Co-I), Michael Fauss (Co-I)
Amount: $3,999,997

2022-2024 **Funding Source:** U.S. Department of Education, National Center for Education Statistics (NCES)
Role: Principal Investigator
Project: National Assessment of Educational Progress (NAEP) Survey Assessment Innovation Lab: Advancing NAEP Math Digital Task Design (NAEP SAIL P198)
Amount: $143,000

2023-2024 **Funding Source:** U.S. Department of Education, National Center for Education Statistics (NCES)
Role: Principal Investigator
Project: Comparing Process Data from the 2019 and 2022 NAEP Math Assessments to Understand Score Drops and Contextualizing NAEP Results through Students' Test-Taking Processes (NAEP SAIL P846)
Amount: $350,000

2023-2024 **Funding Source:** U.S. Department of Education, National Center for Education Statistics (NCES)
Role: Co-Principal Investigator
Project: Select-in-Passage Item Formats in NAEP Reading (NAEP SAIL P847)
Amount: $112,500

2020-2024 **Funding Source:** U.S. Department of Education, National Center for Education Statistics (NCES)
Role: Co-Principal Investigator
Project: Exploring Mathematical Process Data from Large-Scale Digitally-Based Assessments (NAEP SAIL P173)
Amount: $350,000

2020-2023 **Funding Source:** U.S. Department of Education, National Center for Education Statistics (NCES)
Role: Principal Investigator
Project: Using National Assessment Process Data to Understand Cognitive Processes (NAEP SAIL P170)
Amount: $72,000

2021-2025 **Funding Source:** U.S. National Science Foundation
Role: Core Researcher
Project: Investigating the Role of Collaboration on the Development of Student Ideas using a Learning Progression for the Function Concept (2101393)
Amount: $3,063,630

2019-2022 **Funding Source:** U.S. Army Research Institute for the Behavioral and Social Sciences
Role: Core Researcher
Project: Collaborative Problem Solving (CPS) Skill: Estimating an Individual's Contribution to Small Group Performance (W911NF1910106)
Amount: $993,345

2017-2022 **Funding Source:** U.S. Department of Education
Role: Core Researcher
Project: A Theory and Data Driven Approach for Identifying Evidence of Collaborative Problem Solving Skills (R305A170432)
Amount: $1,399,250

2016-2021 **Funding Source:** U.S. National Science Foundation
Role: Participant
Project: Collaborative Research: Using Data Mining and Observation to derive an enhanced theory of SRL in Science learning environments (DRL-1561567)
Amount: $1,492,122

2013-2017 **Funding Source:** U.S. National Science Foundation
Role: Participant
Project: Research on Education and Learning (REAL): Making Math Tutors More Engaging and Effective through Interaction Design Patterns and Educational Data Mining (DRL-1252297)
Amount: $1,480,949

Currently Under Review

2025-2029 **Funding Source:** U.S. Department of Education, Institute of Education Sciences
Role: Principal Investigator
Project: Fair and Responsible Detection of AI-Generated Essays
Amount: $1,699,975

2026-2028 **Funding Source:** U.S. Army Research Institute for the Behavioral and Social Sciences
Role: Co-Principal Investigator
Project: Advancing Theories of Self-Regulated Learning in AI-Supported Learning for 21st-Century Careers
Amount: $889,758

2025-2029 **Funding Source:** U.S. Department of Education, Institute of Education Sciences
Role: Co-Investigator
Project: Assessing STEM Skills Through AI-Based Conversation Based Assessment

Amount: $1,700,000

2025-2029 **Funding Source:** U.S. National Science Foundation
Role: Co-Investigator
Project: Exploring How Conversational Agent Personas Affect Students' Interactions and Learning in Science
Amount: $3,000,000

2025-2029 **Funding Source:** U.S. Department of Education, Institute of Education Sciences
Role: Co-Investigator
Project: Collaborative Character Skills Development with Geographically Dispersed Student Teams
Amount: $4,000,000

Select Internally Funded Research Projects

2025-2026 **Funding Source:** ETS Research Institute
Role: Principal Investigator
Project: AI-Enhanced Self-Regulated Learning and Socially Shared Regulation of Learning

2024-2025 **Funding Source:** ETS Research Institute
Role: Principal Investigator (in collaboration with Yizhou Fan (Peking University) and Yuan Shen (Zhejiang University))
Project: AI-Based Pedagogical Agents for Writing

2022-2024 **Funding Source:** ETS Research Allocation and ETS Enterprise Security Initiative
Role: Principal Investigator
Project: Responsible and Fair Use of AI: Developing Innovative Data Analytics and AI Methods to Support Test Security

2021-2023 **Funding Source:** ETS Research Allocation
Role: Principal Investigator
Project: Assessment of Complex 21st Century Skills in the Age of AI: Process Data Analytics and Psychometric Modeling of Interactive Data from Human-Human Interaction

2020-2022 **Funding Source:** ETS Research Allocation
Role: Principal Investigator
Project: Enhancing Process Data Capabilities: Process Data Analysis for Writing Mentor

2018-2020 **Funding Source:** ETS Research Allocation
Role: Principal Investigator

Project: Interactive Simulations to Enhance Assessment in STEAM Disciplines: Exploring EDM and Learning Analytics

2019-2020 **Funding Source:** ETS Research Allocation
Role: Principal Investigator
Project: Leveraging Response Process Data to Support Next Generation Assessments: Keystroke Analytics, Tool Usage Analytics, and Group Variations

2020 **Funding Source:** ETS Research Allocation
Role: Principal Investigator
Project: Adaptive Learning Systems: A Research Synthesis

Publications

Journal Articles

1. **Jiang, Y.**, Beigman Klebanov, B., Hao, J., Deane, P., & Livne, O. E. (2025). Unveiling patterns of interaction with automated feedback in Writing Mentor and their relationships with use goals and writing outcomes. *Journal of Computer Assisted Learning*, *41*(2). e70014. https://doi.org/10.1111/jcal.70014
2. **Jiang, Y.**, Zhang, M., Hao, J., Deane, P., & Li, C. (2024). Using keystroke behavior patterns to detect nonauthentic texts in writing assessments: Evaluating the fairness of predictive models. *Journal of Educational Measurement*, *61*(4), 571-594. https://doi.org/10.1111/jedm.12416
3. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024). Detecting ChatGPT-generated essays in a large-scale writing assessment: Is there a bias against non-native English speakers? *Computers and Education*, *217*, 105070. https://doi.org/10.1016/j.compedu.2024.105070
4. Andrews-Todd, J., **Jiang, Y.**, Steinberg, J., Pugh, S., L., & D'Mello, S. K. (2023). Investigating collaborative problem solving skills and outcomes across computer-based tasks. *Computers and Education*, *207*, 104928. https://doi.org/10.1016/j.compedu.2023.104928
5. **Jiang, Y.**, Cayton-Hodges, G. A., Nabors Oláh, L., & Minchuk, I. (2023). Using sequence mining to study students' calculator use, problem solving, and mathematics achievement in the National Assessment of Educational Progress (NAEP). *Computers and Education*, *193*, 104680. https://doi.org/10.1016/j.compedu.2022.104680
6. **Jiang, Y.**, Martín-Raugh, M., Yang, Z., Hao, J., Liu, L., & Kyllonen, P. C. (2023). Do you know your partner's personality through virtual collaboration or negotiation? Investigating perceptions of personality and their impacts on performance. *Computers in Human Behavior, 141,* 107608. https://doi.org/10.1016/j.chb.2022.107608
7. **Jiang, Y.** & Cayton-Hodges, G. A. (2023). Investigating problem solving on calculator items in a large-scale digitally-based assessment: A data mining approach. *Journal for Research in Mathematics Education*, *54*(2), 118-140. https://doi.org/10.5951/jresematheduc-2020-0290

8. Gong, T., Shuai, L., **Jiang, Y.**, & Arslan, B. (2023). Using process features to investigate scientific problem-solving in large-scale assessments. *Frontiers in Psychology*, *14*, 1131019. https://doi.org/10.3389/fpsyg.2023.1131019

9. **Jiang, Y.**, Brockway, D. & Moon, J. A., (2023). Incorporating an engineering context into science learning: The effects of task context and response structuring on science understanding and investigation behaviors in a simulation. *Journal of Research in Science Teaching*, *60*(6), 1292-1328. https://doi.org/10.1002/tea.21832

10. Castellano, K., Mikeska, J., Moon, J., Holtzman, S., Gao, J., & **Jiang, Y.** (2022). Examining preservice elementary teachers' answer changing behavior on a content knowledge for teaching science assessment. *Journal of Science Education and Technology, 31*, 528-541. doi: 10.1007/s10956-022-09971-2

11. Gong, T., **Jiang, Y.**, Saldivia, L. E., & Agard, C. (2022). Using Sankey diagrams to visualize drag and drop action sequences in technology-enhanced items. *Behavior Research Methods*, *54*, 117-132. https://doi.org/10.3758/s13428-021-01615-4

12. **Jiang, Y.**, Gong, T., Saldivia, L.E., Cayton-Hodges, G., Agard, C. (2021). Using process data to understand problem-solving strategies and processes for drag-and-drop items in a large-scale mathematics assessment. *Large-Scale Assessments in Education*, *9*(2), 1-31. https://doi.org/10.1186/s40536-021-00095-4

13. Arslan, B., **Jiang, Y.**, Keehner, M., Gong, T., Katz, I. R., & Yan, F. (2020). The effect of drag-and-drop item features on test-taker performance and response strategies. *Educational Measurement: Issues and Practice, 39*(2), 96-106. https://doi.org/10.1111/emip.12326 **[Recognized as a top cited article in 2020-2021 by Wiley]**

14. **Jiang, Y.**, Clarke-Midura, J., Keller, B., Baker, R. S., Paquette, L., & Ocumpaugh, J. (2018). Note-taking and science inquiry in an open-ended learning environment. *Contemporary Educational Psychology, 55*, 12–29. 10.1016/j.cedpsych.2018.08.004

Conference Papers in Stringently Refereed Proceedings

In computing and educational technology-related fields, conference proceedings are among the primary venues for publication and are rigorously peer-reviewed and highly competitive, with acceptance rates typically ranging from 15% to 30%.

15. **Jiang, Y.**, Hao, J., Cui, W., Kerzabi, E., & Kyllonen, P. (2025). Uncovering transferable collaboration patterns across tasks using large language models. *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, pp. 320-335. Springer. https://doi.org/10.1007/978-3-031-98417-4_23

16. Hou, X., Forsyth, C. M., Andrews-Todd, J., Rice, J., Cai, Z., **Jiang, Y.**, Zapata-Rivera, D., & Graesser, A. C. (2025). An LLM-enhanced multi-agent architecture for conversation-based assessment. *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, pp. 119-134. Springer. https://doi.org/10.1007/978-3-031-98417-4_9

17. Zhang, L., Zhai, X., Lin, J., Kleiman, J., Zapata-Rivera, D., Forsyth, C. M., **Jiang, Y.,** Hu, X., & Graesser, A. C. (2025). Exploring communicative strategies for collaborative LLM agents in

mathematical problem solving. *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, pp. 258-265. Springer. https://doi.org/10.1007/978-3-031-99264-3_32

18. **Jiang, Y.**, Graf, E. A., & Andrews-Todd, J. (2025). Using epistemic network analysis and sequential pattern mining to explore the impacts of human facilitation on collaborative mathematical problem solving. *Proceedings of the 18th International Conference on Computer-Supported Collaborative Learning (CSCL 2025),* pp 3-11. International Society of the Learning Sciences. https://doi.org/10.22318/cscl2025.352932
19. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024). Towards fair detection of AI-generated essays in large-scale writing assessments. *Proceedings of the 25th International Conference on Artificial Intelligence in Education (AIED 2024)* (pp. 317-324). Springer. https://doi.org/10.1007/978-3-031-64312-5_38
20. Forsyth, C., Zapata-Rivera, D., Graf, E., & **Jiang, Y.** (2024). Complex conversations: LLMs vs. knowledge engineered conversation-based assessment. *Proceedings of the 17th International Conference on Educational Data Mining (EDM 2024),* pp 868-871. DOI: 10.5281/zenodo.12729976.
21. **Jiang, Y.**, Beigman Klebanov, B., Livne, O. E., & Hao, J. (2023). Analyzing users' interaction with writing feedback and their effects on writing performance. In N. Wang, G. Rebolledo-Mendez, V. Dimitrova, N. Matsuda, O. C. Santos (Eds.), *Proceedings of the 24th International Conference on Artificial Intelligence in Education (AIED 2023)* (pp. 466-471). Springer. https://doi.org/10.1007/978-3-031-36336-8_72
22. Zhang, J., Ober, T., **Jiang, Y.**, Plass, J., & Homer, B. (2021). Predicting executive functions in a learning game: Accuracy and reaction time. *Proceedings of the 14th International Conference on Educational Data Mining (EDM 2021)*, 688-693. **[Won Research and Scholarship Showcase Poster Presentation Award]**
23. **Jiang, Y.**, Almeda, V., Kai, S., Baker, R.S., Ostrow, K., Inventado, P., & Scupelli, P. (2020). Single template vs. multiple templates: Examining the effects of problem structure on performance. *Proceedings of the 14th International Conference of the Learning Sciences (ICLS 2020),* 1015-1022.
24. Gong, T., Shuai, L., Arslan, B., & **Jiang, Y.** (2020). Process based analysis on scientific inquiry tasks using large-scale national assessment dataset. *Proceedings of the 13th International Conference on Educational Data Mining (EDM 2020)*, pp. 417–423.
25. Andres, A., Ocumpaugh, J., Baker, R.S., Slater, S., Paquette, L., **Jiang, Y.**, Bosch, N., Munshi, A., Moore, A. & Biswas, G. (2019). Affect sequences and learning in Betty's Brain. *Proceedings of the 9th International Learning Analytics and Knowledge Conference (LAK 2019)*, 383-390. https://doi.org/10.1145/3303772.3303807
26. **Jiang, Y.**, Bosch, N., Baker, R. S., Paquette, L., Ocumpaugh, J., Andres, J. M. A. L., Moore, A. L., Biswas, G. (2018). Expert feature-engineering vs. deep neural networks: Which is better for sensor-free affect detection? In *Proceedings of the 19th International Conference on Artificial Intelligence in Education (AIED 2018)* (pp. 198–211). Berlin, Heidelberg: Springer.

https://doi.org/10.1007/978-3-319-93843-1_15 **[Won Best Student Paper Award] [Nominated for Best Paper Award]**

27. **Jiang, Y.**, Paquette, L., Baker, R.S., Clarke-Midura, J. (2015). Comparing novice and experienced students in Virtual Performance Assessments. *Proceedings of the 8th International Conference on Educational Data Mining (EDM 2015)*, pp. 136–143.
28. **Jiang, Y.**, Baker, R.S., Paquette, L., San Pedro, M.O., Heffernan, N.T. (2015). Learning, moment-by-moment, and over the long term. *Proceedings of the 17th International Conference on Artificial Intelligence in Education (AIED 2015)*, pp. 654–657. Berlin, Heidelberg: Springer. https://doi.org/10.1007/978-3-319-19773-9_84
29. Sao Pedro, M., **Jiang, Y.**, Paquette, L., Baker, R.S., Gobert, J. (2014). Identifying transfer of inquiry skills across physical science simulations using educational data mining. *Proceedings of the 11th International Conference of the Learning Sciences* (ICLS 2014), pp. 222–229.
30. **Jiang, Y.** (2014). Design of invention-based simulations as preparation for future learning. *Proceedings of Teachers College Educational Technology Conference (TCETC 2014)*, New York, NY.

Book chapters

31. **Jiang, Y.**, Clarke-Midura, J., Baker, R. S., Paquette, L., & Keller, B. (2018). How immersive virtual environments foster self-regulated learning. In R. Zheng (Ed.), *Digital technologies and instructional design for personalized learning* (pp. 28–54). Hershey, PA: IGI Global. 10.4018/978-1-5225-3940-7.ch002

Commissioned Papers and Special Reports

32. **Jiang, Y.**, Cayton-Hodges, G. A., Nabors Oláh, L., & Minchuk, I. (2022). *Using student calculator data to make inferences about student problem solving on the grade 8 NAEP 2019 mathematics assessment*. Report to U.S. Department of Education.
33. NAEP Reporting Task Force White Paper. Submitted to U.S. Department of Education. (2020)
34. NAEP Science ICT Process Data Analyses Report. Submitted to U.S. Department of Education. (2019)
35. NAEP Special Study SBT-DI Task Report. Submitted to U.S. Department of Education. (2018)

Workshop Papers

36. Zapata-Rivera, D., Forsyth, C. M., Graf, A., & **Jiang, Y.** (2024). Designing and evaluating evidence-centered design based conversations for assessment with LLMs. *Proceedings of EDM 2024 Workshop: Leveraging Large Language Models for Next Generation Educational Technologies*. https://doi.org/10.5281/zenodo.12729976

Preprints

37. Zhang, L., Lin, J., Sabatini, J., Zapata-Rivera, D., Forsyth, C., **Jiang, Y.,** Hollander, J., Hu, X., & Graesser, A. C. (2025). Generative data imputation for sparse learner performance data using generative adversarial imputation networks. ArXiv. https://doi.org/10.48550/arXiv.2503.18982

38. Zhang, L., Yeasin, M., Havugimana., F., Lin, J., Zapata-Rivera, D., Forsyth, C., **Jiang, Y.,** Hu, X., & Graesser, A. C. (2025). Bridging global pretraining and similarity-based local fine-tuning in GAIN for robust imputation of sparse learner performance data. TechRxiv. DOI: 10.36227/techrxiv.175607180.00548755/v1

Manuscripts Under Review and In Preparation

1. **Jiang, Y.**, Andrews-Todd, J., Graf, E. A., Lizano, C. (under review). Supporting the development of mathematical thinking in online collaborative problem solving: A learning analytics approach.
2. **Jiang, Y.**, Song, Y., & Ruan, C. (under review). Leveraging Large Language Models for automated coding of socially shared regulation of learning in online collaborative tasks.
3. Andrews-Todd, J., **Jiang, Y.**, Lai, Y., Bennett, A., Funk, R., Graf, E. A., Lamb, C., & Marienau, N. (under review). Examining the impact of human facilitation on collaborative problem solving in mathematics: A mixed methods approach.
4. Ober, T., Courey, K., **Jiang, Y.**, Flor, M., & Zapata-Rivera, D. (under review). Human-AI partnership in qualitative research: From educational settings to potential organizational applications.
5. Alexandron, G., Beigman Klebanov, B., Burstein, J., **Jiang, Y.**, & Strugatski, A. (under review). Applying assessment theories to evaluate LLMs and LLM-supported learners.
6. Andrews-Todd, J., Lai, Y., **Jiang, Y.**, Graf, E. A., Bennett, A., Funk, R., Lamb, C., & Marienau, N. (under review). Facilitating disciplinary reasoning in online collaborative problem solving: A mixed methods study.
7. Zapata-Rivera, D., Forsyth, C. M., Graf, E. A., **Jiang, Y.,** Zhang, L., Rice, J., & Graesser, A. C. (under review). AI scoring of conversation-based assessments using Toulmin Diagrams.
8. Zhang, L., Lin, J., Sabatini, J., Zapata-Rivera, D., Forsyth, C., **Jiang, Y.,** Hollander, J., Hu, X., & Graesser, A. C. (under review). Generative data imputation for sparse learner performance data using generative adversarial imputation networks.
9. Fauss, M., Hao, J., **Jiang, Y.**, Zu, J., Li, C., & Wang, Y. (under review). Effects of sampling temperature on writing style and quality of AI-generated essays.
10. Zhang, L., Yeasin, M., Havugimana., F., Lin, Zapata-Rivera, D., Forsyth, C., **Jiang, Y.,** Hu, X., & Graesser, A. C. (under review). Bridging global pretraining and similarity-based local fine-tuning in GAIN for robust imputation of sparse learner performance data.
11. **Jiang, Y.**, He, Q., & Soyoye, O. O. (in preparation). Exploring students' navigation behaviors in a large-scale reading assessment: A sequence clustering approach.
12. He, Q., Bei, N., **Jiang, Y.** (in preparation). Understanding adults' latent problem-solving strategies by different literacy competence levels with Hidden Markov Model.

13. He, Q., Bei, N., **Jiang, Y.** (in preparation). Identifying latent state transition with multigroup hidden Markov model on process data.
14. Forsyth, C. M., Zapata-Rivera, D., Graf, E. A., Zhang, L., Rice, J., Andrews-Todd, J., Hou, X., **Jiang, Y.**, & Graesser, A. C. (in preparation). Towards an integrated learner model in a multi-agent conversation-based assessment.

Invited Talks

1. **Jiang, Y.** (2025, November). *Exploring and facilitating collaboration through generative AI and learning analytics*. Invited Keynote Talk at the 23rd Shanghai International Curriculum Forum (scheduled). Shanghai, China.
2. **Jiang, Y.** (2025, January). *Educational policy and fairness in the era of generative AI.* China Institute for Educational Finance Research, Peking University. Beijing, China.
3. **Jiang, Y.** (2024, September). *Unlocking the "black box": Leveraging process data in large-scale assessments.* IAEA Workshop on innovations in methodologies. Philadelphia, PA.
4. **Jiang, Y.**, Cayton-Hodges, G. A., & Minchuk, I. (2024, August). *Using process data to explore Grade 4 student calculator use on the NAEP 2019 mathematics assessment*. Invited presentation at the SAIL Knowledge Sharing Session Series. National Center for Education Statistics, U.S. Department of Education, Washington, DC.
5. **Jiang, Y.** (2024, June). *Innovations in methodologies to understand and learn from learner behaviors.* ETS Research Institute. Princeton, NJ.
6. **Jiang, Y.** (2024, June). *Detecting AI-generated essays in a large-scale writing assessment: Is there a bias against non-native English speakers?* ETS Process Data SIG. Princeton, NJ.
7. **Jiang, Y.** (2024, May). *Educational data mining and learning analytics in digitally-based assessments.* University of Pennsylvania, Philadelphia, PA.
8. Forsyth, C., Zapata-Rivera, D., Graf, A., & **Jiang, Y.** (2024, March). *Prompt engineering for conversations in assessment.* Educational Testing Service AI and Interactive Digital Assessments Talk Series. Princeton, NJ.
9. **Jiang, Y.** (2023, March). *Using process data to open the "black box" in large-scale assessments.* Invited Keynote for the 21st Annual EGSS Conference. Montreal, Canada.
10. **Jiang, Y.** & Cayton-Hodges, G. (2023, February). *Using big data to understand mathematical problem solving.* Invited talk for the Journal for Research in Mathematics Education (JRME) Talk Series. Virtual.
11. **Jiang, Y.** (2022, August). *Process data in large-scale educational assessments.* East China Normal University. Shanghai, China.
12. **Jiang, Y.**, Cayton-Hodges, G. A., Nabors Oláh, L., & Minchuk, I. (2022, March). *Using student calculator data to make inferences about student problem solving on the grade 8 NAEP 2019 mathematics assessment*. Invited presentation at the SAIL Knowledge Sharing Session Series. National Center for Education Statistics, U.S. Department of Education, Washington, DC.

13. **Jiang, Y.** (2021, October). *Using process data from the NAEP calculator to understand student mathematical problem solving strategies*. Educational Testing Service Process Data SIG. Princeton, NJ.
14. **Jiang, Y.** (2021, February). Data Science and Education Association, Teachers College Columbia University, New York, NY.
15. **Jiang, Y.**, Cayton-Hodges, G. A., Nabors Oláh, L., & Minchuk, I. (2020, November). *Patterns of calculator use on 2019 grade 8 NAEP and their relationship to performance*. Educational Testing Service. Princeton, NJ.
16. **Jiang, Y.** (2020, August). *Interactive tools in digitally-based assessments: Using process data to inform design*. Educational Testing Service CogSci for AD series. Princeton, NJ.
17. Arslan, B., Gong, T., & **Jiang, Y.** (2019, March). *Going beyond scores: Understanding students' scientific inquiry practices with process data*. Educational Testing Service Process Data SIG. Princeton, NJ.
18. **Jiang, Y.** (2018, November). *Applying EDM and LA methods to explore and analyze student knowledge, behaviors, and strategies as they use computer-based learning environments*. Penn Center for Learning Analytics, University of Pennsylvania, Philadelphia, PA.
19. **Jiang, Y.** (2018, January). *Development of self-regulatory skills in open-ended learning environments.* Carnegie Mellon University. Pittsburgh, PA.
20. **Jiang, Y.** (2017, December). *Combining educational data mining and multilevel modeling to trace development of self-regulatory skills in open-ended learning environments.* Educational Testing Service, Princeton, NJ.
21. **Jiang, Y.** (2017, June)*. Learning, moment-by-moment and over the long term.* Penn Center for Learning Analytics, University of Pennsylvania, Philadelphia, PA.
22. **Jiang, Y.** (2016, May). *Educational technology research in the big data era*. Invited talk at Beijing Language and Culture University. Beijing, China.
23. **Jiang, Y.** (2014, December). *Analyzing educational technology using big data*. Wenzhou University, Wenzhou, China. December 2014.

Conference and Poster Presentations

1. Andrews-Todd, J., Lai, Y., **Jiang, Y.**, Graf, E. A., Bennett, A., Funk, R., Lamb, C., Marienau, N. (under review). *Facilitating disciplinary reasoning in online collaborative problem solving: A mixed methods study*. Paper submitted to the 2026 American Educational Research Association (AERA) Annual Meeting.
2. **Jiang, Y.**, Hao, J., Cui, W., Kerzabi, E., & Kyllonen, P. (2025, July). *Uncovering transferable collaboration patterns across tasks using large language models*. Paper presented at the 26th International Conference on Artificial Intelligence in Education (AIED 2025). Palermo, Italy.
3. Tighe, E., He, Q., Bei, N., **Jiang, Y.**, Kaldes, G., & Magliano, J. (2025, July). *Understanding digital problem-solving strategies by adults' literacy levels: Applying Hidden Markov Models to process*

data. Paper presented at the 2025 Annual Meeting of the Society for Text and Discourse (ST&D), Padua, Italy.

4. Hou, X., Forsyth, C. M., Andrews-Todd, J., Rice, J., Cai, Z., **Jiang, Y.**, Zapata-Rivera, D., & Graesser, A. C. (2025, July). *An LLM-enhanced multi-agent architecture for conversation-based assessment*. Paper presented at the 26th International Conference on Artificial Intelligence in Education (AIED 2025). Palermo, Italy.
5. Zhang, L., Zhai, X., Lin, J., Kleiman, J., Zapata-Rivera, D., Forsyth, C. M., **Jiang, Y.,** Hu, X., & Graesser, A. C. (2025, July). *Exploring communicative strategies for collaborative LLM agents in mathematical problem solving*. Paper presented at the 26th International Conference on Artificial Intelligence in Education (AIED 2025). Palermo, Italy.
6. **Jiang, Y.**, Graf, E. A., & Andrews-Todd, J. (2025, June). *Using epistemic network analysis and sequential pattern mining to explore the impacts of social facilitation on collaborative mathematical problem solving*. Paper presented at Annual Meeting of the International Society of the Learning Sciences (ISLS 2025), Helsinki, Finland.
7. Graf, E. A., van Rijn, P. W., Lizano, C. L., Andrews-Todd, J., **Jiang, Y.**, & Agyapong, F. (2025, June). *Investigating the role of collaboration on the development of student ideas using a learning progression for the function concept*. Poster presented at the biannual DRK-12 PI Meeting, Arlington, VA.
8. Hao, J., Cui, W., **Jiang, Y.**, Kyllonen, P., Kerzabi, E., & Andrews-Todd, J. (2025, April). *AI and analytics to support computer-supported SEL*. Paper presented at the 2025 National Council on Measurement in Education (NCME) Annual Meeting, Denver, CO.
9. Graf, E. A., Forsyth, C., Ruiz Diaz, S., Yan, D., & **Jiang, Y.** (2025, April). *Mathematical explorations in an LLM*. Paper presented at the 2025 American Educational Research Association (AERA) Annual Meeting, Denver, CO.
10. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024, September). *Investigating the bias in detecting ChatGPT-generated essays in a writing assessment*. Paper presented at the 49th Annual International Association for Educational Assessment (IAEA) Conference, Philadelphia, PA.
11. Guo, H., **Jiang, Y.**, Liu, X., & Saldivia, L. (2024, September). *Innovations in methodologies to understand and learn from learner and group behaviors on large-scale assessments*. Workshop presented at the 49th Annual International Association for Educational Assessment (IAEA) Conference, Philadelphia, PA.
12. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024, July). *Towards fair detection of AI-generated essays in large-scale writing assessments*. Poster presented at the 25th International Conference on Artificial Intelligence in Education (AIED 2024), Recife, Brazil.
13. Forsyth, C., Zapata-Rivera, D., Graf, E., & **Jiang, Y.** (2024, July). *Complex conversations: LLMs vs. knowledge engineered conversation-based assessment*. Poster presented at the 17th International Conference on Educational Data Mining (EDM 2024), Atlanta, GA.
14. Zapata-Rivera, D., Forsyth, C. M., Graf, A., & **Jiang, Y.** (2024, July). *Designing and evaluating evidence-centered design based conversations for assessment with LLMs*. Poster presented at the 17th International Conference on Educational Data Mining (EDM 2024), Atlanta, GA.

15. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024, April). *Detecting AI-generated essays in a large-scale educational assessment: Is there a bias against non-native English speakers?* Paper presented at the 2024 American Educational Research Association (AERA) Annual Meeting, Philadelphia, PA.
16. Quirk, V., **Jiang, Y.**, He, Q. (2024, April). *Exploring sex differences in navigation behaviors in a large-scale reading assessment*. Paper presented at the 2024 American Educational Research Association (AERA) Annual Meeting, Philadelphia, PA.
17. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2024, April). *Towards investigating the fairness of detecting LLM-generated essays*. Paper presented at the 2024 National Council on Measurement in Education (NCME) Annual Meeting, Philadelphia, PA.
18. **Jiang, Y.**, Hao, J., Fauss, M., & Li, C. (2023, September). *AI essay detectors: Bias against non-native speakers?*. Poster presented at the ETS AI Expo, Princeton, NJ.
19. **Jiang, Y.**, Beigman Klebanov, B, Livne, O. E., & Hao, J. (2023, July). *Analyzing users' interaction with writing feedback and their effects on writing performance*. Poster presented at the 24th International Conference on Artificial Intelligence in Education (AIED 2023), Tokyo, Japan.
20. He, Q., Bei, N., **Jiang, Y.**, Kaldes, G., & Tighe, E. L. (2023, May). *Understanding adults' latent problem-solving strategies with sequential process data*. Presented at the 2023 IES Annual Principal Investigators Meeting, virtual.
21. Soyoye, O. O., **Jiang, Y.**, He, Q. (2023, April). *Using sequence mining to explore students' behaviors in digital reading assessments*. Paper presented at the 2023 American Educational Research Association (AERA) Annual Meeting, Chicago, IL.
22. Bei, N., He, Q., **Jiang, Y.** (2023, April). *Identifying latent state transitions with multigroup hidden Markov model on process data*. Paper presented at the 2023 National Council on Measurement in Education (NCME) Annual Meeting, Chicago, IL.
23. **Jiang, Y.**, Cayton-Hodges, G., Nabors Oláh, L.K., & Minchuk, I. (2022, April). *Using sequence mining to explore mathematical tool usage in large-scale digitally-based assessments*. Paper presented at the 2022 National Council on Measurement in Education (NCME) Annual Meeting, San Diego, CA.
24. Nabors Oláh, L., Cayton-Hodges, G., **Jiang, Y.**, & Minchuck, I. (2022, June). *A framework for K12 classroom-based OTL in mathematics*. Paper presented at the CCSSO National Conference on Student Assessment, Atlanta, GA.
25. Cisterna, D., Liu, L., Cahill, A., Kinsley, D., Chen, S., Qi, Y., & **Jiang, Y.** (2022, March). *Exploring Student Reasoning Patterns in the Context of an NGSS-Aligned Assessment Task: The Ecosystem Item*. Paper presented at the Annual Meeting of the National Science Teaching Association, Vancouver, BC.
26. Moon, J., **Jiang, Y.**, & Brockway, D. (2021, July). *The role of task context and scaffolding in simulation-based assessments of science learning*. Paper presented at the 12th Conference of the International Test Commission, virtual.

27. Gong, T., Liu, B., Lemke, M. L., **Jiang, Y.**, & Xi, N. (2021, July). *Analysis of user retention in an online platform for English language learning and self-assessment*. Paper presented at the 12th Conference of the International Test Commission, virtual.

28. Zhang, J., Ober, T., **Jiang, Y.**, Plass, J., & Homer, B. (2021, June). *Predicting executive functions in a learning game: Accuracy and reaction time*. Paper presented at the 14th International Conference on Educational Data Mining (EDM 2021), virtual.

29. **Jiang Y.**, Gong, T., & Arslan, B. (2021, April). *Gaps between knowing and doing in scientific inquiry practices within large-scale educational assessments*. Paper presented at the 2021 National Council on Measurement in Education (NCME) Annual Meeting, virtual.

30. **Jiang, Y.** & Hao, J. (2021, April). *Exploring the progression of writing fluency in large-scale assessments using keystroke logs*. Paper presented at the 2021 National Council on Measurement in Education (NCME) Conference, virtual.

31. Gong, T., Zhang, M., **Jiang Y.**, Li, C., & Hao, J. (2021, April). *Investigating production rate of short essay writing using large-scale assessments*. Paper presented at the 2021 National Council on Measurement in Education (NCME) Annual Meeting, virtual.

32. Castellano, K., Mikeska, J., Moon, J., Holtzman, S., Gao, J., & **Jiang, Y.** (2021, April). *Do the tenets of answer changing research hold for an innovative assessment?* Paper presented at the 2021 National Council on Measurement in Education (NCME) Conference, virtual.

33. Andrews-Todd, J., **Jiang, Y.,** Naylor, L., Wilson, S., Toscano, M., & Steinberg, J. (2021, April). *Exploring collaboration interaction patterns and gameplay processes in an educational game*. Paper presented at the 2021 American Educational Research Association (AERA) Annual Meeting, virtual.

34. Gong, T., Shuai, L., Arslan, B., & **Jiang, Y.** (2020). *Process based analysis on scientific inquiry tasks using large-scale national assessment dataset*. Paper presented at the 13th International Conference on Educational Data Mining (EDM 2020), virtual.

35. **Jiang, Y.**, Almeda, V., Kai, S., Baker, R.S., Ostrow, K., Inventado, P., & Scupelli, P. (2020, June). *Single template vs. multiple templates: Examining the effects of problem structure on performance*. Paper presented at the 14th International Conference of the Learning Sciences (ICLS). Nashville, Tennessee.

36. **Jiang, Y.**, Almeda, V., Kai, S., Baker, R.S., Ostrow, K., Inventado, P., & Scupelli, P. (2019, July). *Single template vs. multiple templates: Examining the effects of problem structure on performance*. Paper presented at the 41st Annual Meeting of the Cognitive Science Society (CogSci), Montreal, Canada.

37. Arslan, B., **Jiang, Y.**, Gong, T., Keehner, M., & Katz., I. (2019, July). *A computational cognitive modeling approach to understand test-takers' strategy use in drag-and-drop math questions*. Paper presented at the 41st Annual Meeting of the Cognitive Science Society (CogSci), Montreal, Canada.

38. Arslan, B., **Jiang, Y.,** Gong, T., & Keehner, M. (2019, April). *The effects of drag-and-drop item type design on test-takers' performance and strategy use*. Paper presented at the 2019 American Educational Research Association (AERA) Annual Meeting, Toronto, Canada.

39. Feng, G., Shuai, S., **Jiang, Y.,** Xie, J., & Agard, C. (2019, April). *Analyzing process data for the randomized control trial of NAEP reading scenario-based tasks*. Paper presented at the 2019 National Council on Measurement in Education (NCME) Conference, Toronto, Canada.

40. Andres, A., Ocumpaugh, J., Baker, R.S., Slater, S., Paquette, L., **Jiang, Y.**, Bosch, N., Munshi, A., Moore, A. & Biswas, G. (2019, March). *Affect sequences and learning in Betty's Brain*. Paper presented at the 9th International Learning Analytics and Knowledge (LAK) Conference, Tempe, AZ.

41. **Jiang, Y.**, Bosch, N., Baker, R. S., Paquette, L., Ocumpaugh, J., Andres, J. M. A. L., Moore, Allison L., Biswas, G. (2018, June). *Expert feature-engineering vs. deep neural networks: Which is better for sensor-free affect detection?* Paper presented at the 19th International Conference on Artificial Intelligence in Education (AIED 2018), London, UK.

42. **Jiang, Y.** (2016, April). *Transfer of scientific inquiry skills in open-ended learning environments*. Paper presented at the Teachers College 2016 Psychology Conference, New York, NY.

43. **Jiang, Y.**, Paquette, L., Baker, R.S., Clarke-Midura, J. (2015, June). *Comparing novice and experienced students in Virtual Performance Assessments*. Paper presented at the 8th International Conference on Educational Data Mining (EDM 2015), Madrid, Spain.

44. **Jiang, Y.**, Baker, R.S., Paquette, L., San Pedro, M.O., Heffernan, N.T. (2015, June). *Learning, moment-by-moment, and over the long term*. Paper presented at the 17th International Conference on Artificial Intelligence in Education (AIED 2015), Madrid, Spain.

45. Wang, T., Wang, Y., **Jiang, Y.**, Baker, R., Hu, X. (2015). *中国大陆教育数据挖掘进展综述*. The Third Meeting of Computational Behavioral Sciences -- Corpus Linguistics and Text Data Mining: Modeling and Applications. China.

46. Sao Pedro, M., **Jiang, Y.**, Paquette, L., Baker, R.S., Gobert, J. (2014, June). *Identifying transfer of inquiry skills across physical science simulations using educational data mining*. Paper presented at the 11th International Conference of the Learning Sciences (ICLS), Boulder, CO.

47. **Jiang, Y.** (2014, May). *Design of invention-based simulations as preparation for future learning*. Paper presented at the 2014 *Teachers College Educational Technology Conference (TCETC)*, New York, NY.

48. Kamarainen, A.M., Metcalf, S., **Jiang, Y.**, Grotzer, T. and Dede, C. (2011, August). *EcoMUVE: An immersive virtual environment that prepares students for inquiry learning in real world ecosystems*. Presented at the *Ecological Society of America Annual Meeting*, Austin, TX, USA.

Professional Service

ETS Services

- Coordinator and Organizer of ETS Process Data Special Interest Group. 2020-present.
- Board Member. ETS Summer Internship Review Committee. 2022–2025.
- Organization Committee Member for Team China. ETS Asian Event. 2019.

Professional Communities

- Strategic Initiatives Coordinator. International Educational Data Mining (EDM) Society. 2025–present.
- Chair. National Council on Measurement in Education (NCME) Annual Award Committee. 2025-2028.
- Award Committee Member. American Educational Research Association (AERA) Division D Early Career Award Committee. 2025-2026.
- Industry Track Chair and Organizing Committee Member. The 18th International Conference on Educational Data Mining (EDM). 2025.
- Award Committee Member. National Council on Measurement in Education (NCME) Annual Award for Exceptional Achievement in Educational Measurement. 2024-2025.
- Workshop Co-Organizer on "Innovations in methodologies to understand and learn from learner and group behaviors on large-scale assessments". The Annual International Association for Educational Assessment (IAEA) Conference. 2024.
- Senior Program Committee Member. The International Conference on Artificial Intelligence in Education (AIED). 2022, 2025.
- Program Committee Member. International Conference on Educational Data Mining (EDM). 2017, 2018, 2019, 2021, 2022, 2023, 2025.
- Program Committee Member. The International Learning Analytics and Knowledge Conference (LAK). 2019. 2026.
- Program Committee Member. The International Conference on Computer Supported Education (CSEDU). 2025.
- Program Committee Member. The International Conference of the Learning Sciences (ICLS). 2025.
- Program Committee Member. The International Conference on Artificial Intelligence in Education (AIED). 2021, 2023, 2024.
- Program Committee Member. AIED Industry and Innovation Track. 2022.

Editorship

- Invited Guest Editor, Journal of Intelligence. Special issue on "Intelligent Assessment and Learning Analytics in the Age of AI". 2025-present.

Ad-hoc Journal Reviewer

- Computers and Education
- Computers in Human Behavior
- Frontiers in Psychology
- International Journal of Educational Data Mining
- International Journal of Artificial Intelligence in Education
- Journal of Research in Science Teaching
- Frontiers in Artificial Intelligence
- Journal of Intelligence
- Computers and Education: Artificial Intelligence
- Journal of Learning Disabilities
- Large-Scale Assessments in Education

- Assessing Writing
- The Internet and Higher Education
- Journal of Data and Information Quality
- Computer-Based Learning in Context
- Acta Psychologica
- Computer Standards & Interfaces
- Quality Assurance in Education

Reviewer for International Conferences and Other Publications

- International Conference on Artificial Intelligence in Education (AIED, 2021-2025)
- International Conference on Educational Data Mining (EDM, 2017-2019, 2021-2023, 2025)
- International Learning Analytics and Knowledge Conference (LAK, 2019, 2026)
- International Conference of the Learning Sciences (ICLS, 2025)
- The 17th International Conference on Computer Supported Education (CSEDU, 2025)
- CHI (2021)
- EDMGAMES (2019)
- ETS Tech Review (2018-present)
- Digital Technologies and Instructional Design for Personalized Learning (2018)

Teaching

University of Pennsylvania

EDUC 6191: Core Methods in Educational Data Mining (Instructor) Fall 2025

EDUC 6195: Capstone Seminar: Learning Analytics (Mentor) Fall 2025

Mentorship

Mentoring Activities through University of Pennsylvania Learning Analytics and Artificial Intelligence program, **ETS Research Internship Program, NAEP Internship Program, ETS-UTSA Pathways Summer Internship Program, etc.**

Ph.D.

2025 Vicky Pilitsis (University of Pennsylvania). *Teacher Perceptions of AI in Secondary Education.*

2025 Siyang Liu (University of Michigan, co-advisor: Jessica Andrews-Todd). *Exploring Features that Optimize the Use of AI to Support Assessment and Learning in STEM.*

2025 Maria Moya (University of Texas at San Antonio, co-advisor: Yi Song). *Self-Regulated Learning and Socially Shared Regulation of Learning.*

2024 Xinying Hou (University of Michigan, co-advisors: Jessica Andrews-Todd, Carol Forsyth). *An LLM Multi-Agent Architecture for Conversation-Based Assessment.*

2024 Yehong Yang (Beijing Normal University). *Using Social Network Analysis to Explore Interaction Patterns in Collaborative Decision Making Tasks.*

2023 Victoria Quirk (University of Illinois Urbana-Champaign, co-advisor: Qiwei He). *Exploring Subgroup Differences in Navigation Behaviors and Cognitive Processes in 2019 NAEP Reading Assessments.*

2022 Olushola Soyoye (University of Delaware, co-advisor: Qiwei He). *Using Sequence Mining to Explore Cognitive Processes and Strategies in Assessments.*

2022 Ni Bei (University of Washington, co-advisor: Qiwei He). *Identifying Latent State Transition in Problem-Solving*.

2021 Reginald Ziedzor (Southern Illinois University). *Investigating Engagement and Motivation in Digitally-Based Reading Assessments.*

2020 Blake Turner (University of Maryland, co-advisors: Gabrielle Cayton-Hodges, Leslie Nabors Olah, and Ilona Minchuk). *Understanding Impacts of Culture and Race on NAEP Math: Assessment and Interpretation.*

2020 Ropa Denga (Rensselaer Polytechnic Institute, co-advisor: Hilary Persky). *Effects of Formatting in Reading Blocks: Exploring Test-Takers' Response and Behavioral Patterns.*

Master's

2020 Sofia Santillan (University of Texas at San Antonio, co-advisors: Jessica Andrews-Todd and Jonathan Steinberg). *Perceptions of Self vs. Partner in Collaborative Problem-Solving Tasks.*

Undergraduate

2020 Grace Eke (Xavier University of Louisiana, co-advisors: Gabrielle Cayton-Hodges and Chris Agard). *Exploring Use of Virtual Tools for Mathematics Assessment*.

2020 Laila Naylor (University of Texas at San Antonio, co-advisors: Jessica Andrews-Todd and Jonathan Steinberg). *Comparing Gender Combination Pairs to Assess Interaction Patterns.*

Media Coverage

From Wall to Bridge: Supporting Mathematics Learning Through Collaboration and Guided Facilitation. (2025, July). *Behind the Breakthroughs*.
Tutwiler, Jiang to Receive Alumni Council Awards. (2025, May). *Harvard Graduate School of Education*.

Computer Skills

Python; R; SPSS; Java; RapidMiner; MPlus; HLM; SQL; Adobe Creative Suites (Photoshop, Flash, InDesign, etc.); HTML; CSS; Javascript; XML; Video-editing; Microsoft Office Expert (Microsoft Authorized).

Affiliations

American Educational Research Association; National Council for Measurement in Education; International Artificial Intelligence in Education Society; International Society of the Learning Sciences; International Educational Data Mining Society; Cognitive Science Society; International Test Commission

Last updated on August 30, 2025