Shiyan Jiang

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CURRENT EMPLOYMENT

Assistant Professor: Learning Design and Technology, College of Education, North Carolina State University, July 2019 – present.

EDUCATION

Ph.D. in **Teaching and Learning (Specialization in Technology-enhanced STEM Education),** University of Miami (UM). 2018. Advisor: **Dr. Ji Shen**

Online M.S. in **Computer Science (OMSCS)**, Georgia Institute of Technology.

B.S. in **Educational Technology**, East China Normal University.

PRIOR EMPLOYMENT

Post-doctoral Associate: Language Technologies Institute, School of Computer Science, Carnegie Mellon University, 2018-2019. Advisor: **Dr. Carolyn P. Rosé**

Graduate researcher: Teaching and Learning, Teaching and Learning, University of Miami, 2013-2018. Advisor: **Dr. Ji Shen**

Research Internship: Information Sciences and Technology, The Pennsylvania State University, Summer 2017. Advisor: **Dr. Mary Beth Rosson**

Data Visualization Developer Internship: Sun Sentinel, FL, Summer 2016.

Research Internship: WISE, University of California, Berkeley, Summer 2015. Advisor: **Dr. Marcia Linn**

Research Internship: Concord Consortium, MA, Summer 2014. Advisor: **Dr. Charles Xie**

RESEARCH

Interest

K-12 AI (Artificial Intelligence) education
Identity development
Data science education
Data visualization

Digital literacy as a means for STEM integration
Emerging technologies for teaching and learning
Computer supported collaborative learning (CSCL)

Funded project

Project Narrative Modeling with StoryQ: Integrating Mathematics, Language Arts, and Computing to Create Pathways to Artificial Intelligence Careers (**NSF ITEST** Award # 1949110; $1.5 M; Co-PI); June 2020 – June 2023

- Create and test StoryQ, a web-based text mining and narrative modeling platform;
- Develop, implement, and test a Narrative Modeling with StoryQ curriculum;
- Investigate instructional and technological strategies for helping youth understand AI concepts and develop interests in AI careers.

Project Learning Analytics in STEM Education Research Institute (LASER) (**NSF ECR** Award # 2025090; $ 1 M; Co-PI); September 2020 – September 2023

- Provide professional development for 150 early and mid-career STEM education researchers in Learning Analytics (LA);
- Investigate research questions related to developing inclusive LA communities.

Project Enhancing Undergraduate Learning About Biomechanics and Data Science Through Augmented Reality and Self-motion Data (**NSF IUSE** Award # 2013451; $600 K; Co-PI); September 2020 – September 2023

- Build an augmented learning platform to deliver human motion data;
- Develop curriculum modules for biomechanics and data science courses;
- Implement the curriculum modules in undergraduate classrooms and evaluate their impacts in biomechanics and data science courses.

Project Multimodal AI literacy: Supporting K-12 AI Education through Composing with Multiple Modes (**Catalyst Grant** Award; $ 10 K; PI); January 2020 – June 2020

- Develop a free summer camp that engages youth in learning AI concepts;
- Investigate research questions related to supporting K-12 AI education with multimodal composition.

Project Learning COVID-19 with Data Visualizations (**Faculty Research and Professional Development** Award; $ 5 K; PI); July 2020 – July 2021

- Provide opportunities for middle and high school youth to engage in understanding, exploring, and evaluating data visualizations about COVID-19.
- Investigate research questions related to supporting data science education in remote learning.

Peer - reviewed journal article

Kahn, J. & **Jiang, S.** (in press). Learning with data visualizations: Youth data wrangling and data moves in modeling family migration. *Learning Media and Technology*.

Jiang, S., Shen, J., Smith, B. E., & Kibler, K. (2020). Science identity development: How multimodal composition mediates role-taking as scientist in a media-rich learning environment. *Educational Technology Research and Development.* 1-26.

Jiang, S. & Kahn, J. (2020). Data wrangling practices and collaborative interactions with aggregated data. *International Journal of Computer-Supported Collaborative Learning.* 1-25.

Jiang, S., Shen, J., & Smith, B. E. (2019). Designing discipline-specific roles for interdisciplinary learning: two comparative cases in an afterschool STEM+ L programme. *International Journal of Science Education,* 1-24.

Jiang, S., Smith, B. E., & Shen, J. (2019). Examining how different modes mediate adolescents' interactions during their collaborative multimodal composing processes. *Interactive Learning Environments*, 1-14.

Smith, B. E., Shen, J., & **Jiang, S.** (2019; invited article). The science of storytelling: Middle schoolers engaging with socioscientific issues through multimodal science fictions. *Voices from the middle, 26*(4).

Barth-Cohen, L., **Jiang, S.**, Shen, J., Chen, G., & Eltoukhy M. (2018). Interpreting and navigating multiple representations as central to computational thinking in a robotics programming environment. *Journal for STEM Education Research.*

Sung, S., Shen, J., **Jiang, S.**, & Chen, G. (2017). Comparing the effects of dynamic computer visualization on undergraduate students' understanding of osmosis with randomized posttest-only control group design. *Research and Practice in Technology Enhanced Learning*.

Chen, G., Shen, J., Barth-Cohen, L., **Jiang, S**., Huang, X., Eltoukhy, M. (2017). Assessing elementary students' computational thinking in everyday reasoning and robotics programming. *Computer & Education, 109*, 162-175.

Proceeding

Jiang, S., Huang, X., Xie, C., Sung, S., & Yalcinkaya, R. (2020). Augmented scientific investigation: Support the exploration of invisible "fine details" in science via Augmented Reality. *Proceedings of the 19th ACM International Conference on Interaction Design and Children (IDC)*, London, UK. (Online)

Jiang, S. & Kahn, J. (2020). Data patterns and missing data: Complex issues in designs for learning with aggregated data in family migration context. *Proceedings of the 14th International Conference of the Learning Sciences (ICLS)*, Nashville, USA. (Cancelled)

Jiang, S., Yang, K., Suvarna, C., Casula, P., Zhang, M., & Rosé, C. (2019). Applying rhetorical structure theory to student essays for providing automated writing feedback. *Proceedings of the Workshop on Discourse Relation Parsing and Treebanking 2019 (pp*. 163-168).

Jiang, S. & Kahn, J. (2019; nominee of best paper). Data wrangling practices and processes in modeling family migration narratives with big data visualization technologies. *Proceedings of the 13th International Conference of the Computer Supported Collaborative Learning (CSCL)*, Lyon, France.

Jiang, S., Shen, J., Smith, B., & Kibler, K. (2018). Examining science identity development in disciplinary role-taking multimodal composing environment. *Proceedings of the 13th International Conference of the Learning Sciences (ICLS)*, London, UK.

Smith, B., Shen, J., **Jiang, S.**, Chen, G., Hamaoui, M., & Torralba, J. (2018). Multimodal reflection: Adolescents remixing and sharing their experiences in an informal STEM+L academy. *Proceedings of the 13th International Conference of the Learning Sciences (ICLS)*, London, UK.

Jiang, S., Shen, J., & Smith, B. (2016). Integrating science and writing in multimedia science fictions: Investigating student interactions in role-taking. *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*, Singapore.

Shen, J., Chen, G., Barth-Cohen, L., Eltoukhy, M., & **Jiang, S.** (2016). Developing a language-neutral instrument to assess fifth graders' computational thinking. *Proceedings of the 12th International Conference of the Learning Sciences (ICLS)*, Singapore.

Jiang, S., Shen, J., Sun, Y. (2015). Conceptualizing, analyzing, and visualizing massive data on student engagement in MOOCs: A literature review. *Proceedings of the 11th International Conference of the Computer Supported Collaborative Learning (CSCL)*, Gothenburg, Sweden.

Book chapter

Shen, J., Smith, B. E., & **Jiang, S**. (accepted). Integrating multimodal composing technology (MCT) in interdisciplinary learning. In L. C. de Oliveira & A. M. Menda (Eds.), *English language teaching methods, approaches, and lessons*. Charlotte, NC: Information Age Publishing.

Shen, J., **Jiang, S.**, & Liu, O. L. (2015). Reconceptualizing a college science learning experience in the new digital era: A review of literature. In X. Ge, D. Ifenthaler, J.M. Spector (Eds.) *Full steam ahead: Emerging technologies for STEAM (pp. 61-79)*. New York: Springer.

Manuscripts under review

Jiang, S., Huang, X., Sung, S., Li, C., & Xie, C. (under review). Investigating teachers' perceptions of conducting experiments remotely via Telelab. *IEEE Transactions on Learning Technologies.*

Shen, J., Chen, G., Barth-Cohen, L., **Jiang, S.**, Eltoukhy, M. (under review). Connecting students' computational thinking in everyday reasoning and programming: Designing a humanoid robotics curriculum for elementary school students. *Journal of Research on Technology in Education*.

Manuscripts in preparation

Jiang, S. & Tatar, C. (in preparation). Effects of augmented infrared reality technology on learning achievement: Case of high school students.

Jiang, S. & Rosé, C. (in preparation). The effect of role rotation on collaborative programming with the design of an Artificial Intelligence agent.

Jiang, S. & Tang, H. (in preparation). Epistemic agency patterns in engineering design.

Presentation (Selected)

Jiang, S., & Kahn, J. (2020, April). *Storytelling with data visualizations: Narrative patterns in modeling family migration narratives*. Poster to be presented at the annual conference of American Educational Research Association (AERA), San Francisco, CA. (Cancelled)

Jiang, S. (2020, January). Data wrangling practices and learning with aggregated data in talk-in-interaction. **Invited** virtual seminar, Concord Consortium.

Jiang, S. (2019, October). *Visual analytics of learning data*. **Invited** virtual lecture, Research Methods & Technologies course, University of Arizona.

Jiang, S., Shen, J., & Smith, B.E. (2019, April). *Patterns and trajectories of an adolescent's participation during an integrated STEM and Digital Literacies program*. Paper presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Kahn, J. & **Jiang, S**. (2019, April). *Youth data wrangling and modeling family migration*. Paper presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Smith, B. E., Kolovou, M., **Jiang, S.**, Ran, H., Torralba, J., & Shen, J. (2019, April). *Multidimensional meaning-making: Adolescents leveraging visuals and sounds in their multimodal science fictions.* Paper to be presented at the annual conference of American Educational Research Association (AERA), Toronto, Canada.

Chen, G., Shen, J., **Jiang, S.**, Barth-Cohen, L., & Eltoukhy, M. (2018, April). *Linking elementary students' problem-solving process to computational thinking*. Paper presented at the 2018 annual conference of American Educational Research Association (AERA), New York City, NY.

Jiang, S. & Cong, Q. (2017, September). *Exploring the impact of students' academic usage of mobile devices on technostress and academic performance: A double-edged sword*. Paper presented at the annual conference of Association for Learning Technology (ALT), Liverpool, UK.

Jiang, S., Smith, B.E., & Shen, J. (2017, April). *Peer Interaction in multimodal composition: The story behind the scenes*. Paper presented at the annual conference of American Educational Research Association (AERA), San Antonio, TX.

Barth-Cohen, L., **Jiang, S.,** Shen, J., Chen, G., & Eltoukhy, M., (2017, April). *Elementary school students' computational thinking practices in a robotics-programming environment*. Poster presented at the annual conference of American Educational Research Association (AERA), San Antonio, TX.

Shen, J., Smith, B., **Jiang, S.**, Kibler, K., Chen, G., & Irina, M. (2017, October). *Examining middle school students' collaborative multimodal composing through disciplinary identity development*. Poster presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Jacksonville, FL.

Jiang, S., Smith, B.E., & Shen, J. (2016, October). *Exploring multimodal composition in collaborative digital learning environments*. Paper presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Las Vegas, NV.

Jiang, S., Shen, J., & Smith, B. (2016, April). *Assessing students' scientific literacy in collaborative science fiction writing.* Poster presented at the 2016 Annual Meeting of the American Educational Research Association (AERA), Washington, D.C.

Sung, S., Shen, J., **Jiang, S.,** & Chen, G. (2016, April). *The effect of including dynamic computer visualizations on assessing college students' interdisciplinary understanding of osmosis*. Poster to be presented at the 2016 Annual Meeting of the American Educational Research Association (AERA), Washington, D.C.

Xie, C., Nourian, S., **Jiang, S.** (2015, April). *Performance assessment of engineering design using process analytics based on CAD software*. The National Association for Research in Science Teaching (NARST) Conference 2015, Chicago, IL.

Avalos, M. A., Bengochea, A., Malova, I., **Jiang, S.**, Carlo, M., & Augustin, J. (2014, December). *Vocabulary instruction for English learners then and now: Do we have it right for the future?* Paper presented at the 64th Annual Conference of the Literacy Research Association (LRA), Marco Island, FL.

Shen, J., **Jiang, S.**, Cheng, G., & Namdar, B. (2014, October). *Designing the innovative Knowledge Organization System (iKOS) for science learning*. Poster presented at the Annual International Convention of the Association for Educational Communications and Technology (AECT), Jacksonville, FL.

Other

Jiang, S. (2016). A technology-enhanced curriculum: Integrating STEM learning with data visualization, published online (www.wise.berkeley.edu).

Reviewer

Journal Review: International Journal of Computer-Supported Collaborative Learning;

Computers & Education; Educational Technology Research & Development; Journal of Science

Education and Technology; Aslib Journal of Information Management

NSF Panel Review: ITEST

Conference Review: ICLS; AERA; AECT

TEACHING

Graduate Level

Instructor of ECI 510: Research Applications in Curriculum and Instruction, North Carolina State University, Fall 2020. Taught courses about introductions to educational research.

Instructor of ECI 519: Data Visualization in Education, North Carolina State University, Fall 2019 and Spring 2020. Taught courses about the application of data visualization in educational contexts.

Invited speaker of SCS 11344: Machine Learning in Practice, Carnegie Mellon University, Fall 2018. Taught courses in Machine Learning for graduate students.

Invited speaker of TAL 690: **Introduction to Learning Sciences**, UM, Spring 2016. Taught courses in Learning sciences for doctoral students.

Undergraduate level

Invited speaker of TAL 543: Science Instruction in the Secondary School, UM, Spring 2016. Taught courses about STEM-related classroom technologies for pre-service teachers.

Teaching assistant of TAL 323: Science Instruction in the Elementary School, UM, Fall 2013/Fall 2014. Led class discussions and graded student assignments.

Teacher professional development

Instructor of educational technology workshops for in-service teachers, Summer 2018 (n = 12); Fall 2017 (n = 73); Spring 2016 (n = 30); Fall 2014 (n = 25). Trained and supervised in-service teachers to implement technology-enhanced STEM projects.

K-12 teaching

Instructor of multiple formal and informal programs associated with Project STEM+L, including

- Afterschool program for 5th-8th graders from Miami-Dade public schools (Summer 2018; Spring 2018; Fall 2017; Summer 2017; Fall 2015).
- Elective STEAM course for Henry S. West Laboratory School (Fall 2017; Fall 2016)
- Afterschool program for Ponce de Leon Middle School (Spring 2015)

Instructor of project First Star UM Academy, UM, Summer 2017. Taught digital composing to guide under-represented high schoolers to envision future professions.

GRADUATE STUDENTS SUPERVISED

Rabia Yalcinkaya (Doctoral student, Co-chair with Angela Wiseman)

Cynthia MacDonald (Research-track Master student)

Beth Heisel, Kristine Barnette, Tracy Demarest (Practice-track Master students)

SERVICE

Mentor for Data Science Camp, CMU (Train data scientists to tackle educational problems)

HONORS AND AWARDS

FI Scholar, Friday Institute for Educational Innovation, North Carolina State University, 2020

Catalyst Grant Award, North Carolina State University, 2020

Early Career Workshop Award, International Society of the Learning Sciences, 2019

Bronze Award, International Serious Play, Treasure Key, 2017

Innovation Award in Learning Technology Design and Development, the 2nd e-ICON World Contest, South Korea, 2012

PROFESSIONAL MEMBERSHIP

International Society of the Learning Sciences (ISLS)

Association of Educational Communication and Technology (AECT)

American Educational Research Association (AERA)

Interaction Design and Children (IDC)