

Shiyan Jiang

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EDUCATION

PH.D.: Teaching and Learning (Specialization in STEM Education), University of Miami (UM),
September 2013 – August 2018

M.S.: Computer Science (Specialization in Machine Learning), Georgia Institute of Technology,
January 2017 – August 2018

B.S.: Educational Technology, East China Normal University, September 2009 – June 2013

RESEARCH

Interest

Integrated STEAM education
Computer supported collaborative learning
Emerging technologies for teaching and learning
Human-computer interaction
Massive open online courses
Computational thinking
Data visualization
Learning analytics
Natural Language Processing
Machine Learning

Experience

Project STEM+L: Integrating STEM and Digital Literacies with Adolescents (NSF Award # 1713191; PIs: Drs. Ji Shen and Blaine Smith); July 2017 – present

- Assisted with developing and implementing summer camps in which adolescents (ages 10-13) took disciplinary-specific roles and worked in small groups to create multimodal science fictions
- Led the design of the Book function and logging function of a CSCL platform iKOS (ikos.miami.edu)
- Designed instruments to measure students' participation in STEM and literacy practices and disciplinary-specific roles and collected and analyzed data

Project IF: Imagine the Future (Directors: Drs. Ji Shen and Blaine Smith); September 2014 – present

- Assisted with developing and implementing the project in both after school and in-school settings by employing design-based research methodology to help 5th to 8th graders develop integrated STEM competency
- Designed the message board function and knowledge visualization function of iKOS
- Developed and conducted semi-structured interviews

- Collected and analyzed multiple sources of data including videos, interviews, and student artifacts

Project We Are! Building Identity, Participation and Connectivity within World Campus Cohorts (Funded by **Center for Online Innovation in Learning** at Penn State University; PI: Dr. Mary Beth Rosson); May 2017 – present

- Led research in designing learning analytics dashboard for online learners in Penn State by collaborating with researchers from diverse backgrounds (e.g., data science, learning science, and psychology)
- Developed and conducted semi-structured interviews with online learners from World Campus, Penn State University
- Made design recommendations for a visualizing learning activities tool drawn up based on semi-structured interviews and review of existing learning analytics dashboards

Project TREES: Transformative Robotics Experience for Elementary Students (**NSF** Award # 1523010; PIs: Drs. Ji Shen, Lauren Barth-Cohen, and Moataz Eltoukhy); May 2015 – May 2018

- Developed and implemented a robotics curriculum for fifth-grade students to learn programming with the humanoid robot platform NAO
- Designed assessment items to measure students' computational thinking

Project GRIDS: Graphing Research on Inquiry with Data in Science (**NSF** Award # 1418423; PIs: Drs. Marcia Linn and Ou Liu); May 2015 – August 2015

- Developed and implemented a 10-day WISE self-propelled vehicles unit at San Jose Middle school, CA
- Collected and coded students' responses using KI (Knowledge Integration) rubric
- Analyzed pre- and post- data

Project Vocabulary Instruction Content Analysis (Director: Dr. Avalos); September 2014 – December 2014

- Developed a large and comprehensive coding framework
- Coded two teacher-version textbooks that represent Pre- and Post-Common Core State Standards curricula
- Used Gephi to analyze links between codes

Project Mixed-Reality Labs: Integrating Sensors and Simulations to Improve Learning (**NSF** Award # 1124281; PI: Dr. Charles Xie; Concord Consortium, MA); May 2014 – August 2014

- Designed and implemented a one-week Mix-Reality lab experiment at Arlington High School, MA

Project Large-Scale Research on Engineering Design Based on Big Learner Data Logged by a CAD Tool (**NSF** Award # 1348530; PI: Charles Xie in Concord Consortium, MA); May 2014 – August 2014

- Designed and implemented a one-week engineering design activity at Arlington High School, MA
- Collected and analyzed logging data

Project Ontology-based Feedback System for iKOS (Director: Drs. Ji Shen and Ubbo Visser); January 2014 – May 2014

- Assisted with developing an ontology-based feedback system for iKOS

Project Power in Students' Mathematical Problem Solving (Director: Dr. Langer-Osuma); September 2013 – December 2013

- Contributed to research design concerning power issues in small group interactions for Problem Based Learning in fourth-grade math classroom

Project Augmented Reality (AR) Chemistry Labs Design and Development (National Undergraduate Innovation Funding; PI: Shiyang Jiang; Advisor: Dr. Xiangdong Chen); March 2012 – March 2013

- Created 3D models of chemistry experimental equipment, such as beaker and separating funnel
- Developed the preparation of ethyl acetate AR application that integrated a timely feedback system to guide the experiment

Project Interactive Augmented Reality (AR) Book Design and Development (Shanghai Undergraduate Innovation Funding; PI: Shiyang Jiang; Advisor: Dr. Xiangdong Chen); November 2011 – November 2012

- Create 3D models of objects (e.g., chicken) in an ancient Chinese family daily life scenario
- Developed an AR Book in which users could navigate the scenario with AR code and learn Chinese from transitions among 3D objects, pictographs, traditional Chinese characters, and simplified Chinese characters

Peer - reviewed journal article

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., Shen, J., Smith, B., & Kibler, K. (2018). Examining Science Identity Development in a 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., **Jiang, S.,** & Liu, O. L. (2015). Reconceptualizing a college science learning experience in the new digital era: a review of literature. In *Emerging Technologies for STEAM Education* (pp. 61-79). Springer International Publishing.

Manuscripts in preparation

Jiang, S., Shen, J., & Smith, B. E. (2017). *Designing Discipline-specific Roles for Interdisciplinary STEM Learning: Two Comparative Cases in an Afterschool Program*. Manuscript submitted for publication.

Barth-Cohen, L., **Jiang, S.,** Shen, J., Chen, G., & Eltoukhy M. (2017). *Interpreting and Navigating Multiple Representations as Central to Computational Thinking in a Robotics Programming Environment*. Manuscript submitted for publication.

Jiang, S., Smith, B. E., & Shen, J. (in preparation). Examining How Multimodal Representations Mediate Peer Interaction during Digital Multimodal Composing Processes.

Jiang, S., Zhang, Y., & Raymo, F.M. (in preparation). Spectroscopic and Microscopic Analysis of Diffusion in Hydrogel for an Interdisciplinary Undergraduate Laboratory.

Jiang, S., Rosson M. B., Sun, N., & Cheng, Z. (in preparation). Reframing Learning Analytics as a Tool for Supporting Self-Regulated Learning in Higher Education.

Shen, J., **Jiang, S.,** & Smith, B.E. (in preparation). Disciplinary role taking in interdisciplinary multimodal composing.

Presentation

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.

Shen, J., Smith, B., **Jiang, S.,** Kibler, K., Chen, G., & Irina, M. (2017, November). 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., & 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.

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, November). 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.

Assisted with the Following NSF Grant Proposal Writing

Shen, J. (2017). Project Imagine the Future (IF): Designing Interdisciplinary STEM Learning for Middle School Students. (\$ ~\$2.2M). Pending

Shen, J. & Smith, B. (2017). Integrating STEM and Digital Literacies with Adolescents (Project STEM+L). National Science Foundation. (\$ ~350K). Funded

Shen, J., Barth-Cohen, L., & Eltoukhy, M. (2015). Transformative Robotics Experience for Elementary Students (Project TREES). National Science Foundation. (\$ ~300K). Funded

Shen, J., Smith, B., Padolf, A., & Jordan, S. (2015). Digesting STEM through Food Myth-busting. (\$ ~1,800K). Declined

Shen, J., Xie, C., & Ahn, S. (2014). Assessing Modeling Practices Through Comprehensive Modeler Profiling. (\$ ~1,400K). Declined

Shen, J., Barth-Cohen, L., Secada, W. G., & Visser, U. (2014). EXP: Developing Ontologies for Collaboration in a Knowledge-centered Community (DOCKC). (\$ ~550K). Declined

Reviewer

American Educational Research Association (AERA) conference, 2015/2016/2017, reviewer

TEACHING

College Level

Teaching Assistant of TAL323: Science Instruction in the Elementary School, University of Miami (UM), Fall 2013/Fall 2014. Assisted with implementing in-classroom activities, leading class discussions, and evaluating student works.

Instructor of TAL 543 (two sessions): Science Instruction in the Secondary School, UM, Spring 2016. Trained and supervised pre-service teachers for implementation of STEM-related classroom technologies and conducting collaborative learning activities and assessments.

Invited speaker of TAL 690: Introduction to the Learning Sciences, UM, Spring 2016. Presented research on the impact of role-taking on disciplinary identity development to doctoral students.

Instructor of a workshop for graduate students in Medical Sciences at the UM, Spring 2016. Presented research on online teaching focusing on effective MOOC video formats and strategies.

K-12 Teaching

Instructor of multiple formal and informal programs associated with Project Imagine the Future, including

- afterschool program for Ponce de Leon Middle School (Spring 2015),
- afterschool program for 5th-8th graders from Miami-Dade public schools (Fall 2015),
- elective STEAM course for Henry S. West Laboratory School (Fall 2016; Fall 2017),
- summer camp and fall extension sessions for 5th-8th graders from Miami-Dade public schools (August 2017 -present).

Instructor of project First Star UM Academy, Summer 2017. Led three sessions in guiding underrepresented high schoolers to envision future professions through multimodal composition.

Instructor of educational technology workshops designed for in-service teachers, Fall 2014 (n=25), Spring 2016 (n=30). Trained and supervised in-service teachers for implementation of STEM projects using Scratch and other technological tools.

OTHER EXPERIENCE

Game developer for Treasure Key. 1) Designed and developed Treasure Key (a drawing game for 5-7-year-olds). The game was published in google play and it is the 2017 International serious

play bronze medal winner. 2) Collaborated with graduate students from other disciplines, including graphic design and game theory.

Data visualization developer for Sun Sentinel. 1) Designed and developed data visualizations as required to support online daily news; 2) Developed web pages using HTML5/CSS3, D3.js, JQuery, AngularJS, and React.

Front-end web developer for Whip n Dip. 1) Designed and developed a website for Whip n Dip (an ice cream shop that started 1985 as a family-run store). 2) Developed the website using InVision, HTML/CSS, JavaScript, and related tools.

TECHNOLOGY SKILLS

- Data processing (Python)
- Data visualization (D3.js)
- Social Network Analysis (Gephi)
- Quantitative analysis (SPSS and R)
- Qualitative analysis (e.g., Atlas.ti)
- MOOC development (Camtasia)
- Front-end development (e.g., JS)
- JavaScript frameworks (AngularJS)
- Back-end development (e.g., PHP)
- Adobe Creative Cloud
- Semantic web (Java)
- Game development (Cocos2d-x and Unity 3D)

AWARDS

Graduate Travel Funding Award, Graduate School, UM, 2017/2016/2015

Graduate Travel Funding Award, School of Education and Human Development (SEHD), UM, 2017/2016/2015

Graduate Research Assistantship, 2017/2016/2015/2013

Graduate Teaching Assistantship, 2014

Innovation Award, the 2nd e-ICON World Contest, South Korea, 2012

REFERENCES

Dr. Ji Shen, Associate Professor of Science Education, Department of Teaching and Learning, University of Miami, Coral Gables, FL, Tel: 305-284-4970 j.shen@miami.edu

Dr. Blaine E. Smith, Assistant Professor of Digital Literacy Education, Department of Teaching, Learning, and Sociocultural Studies, University of Arizona, Tucson, AZ, Tel: 520-621-2928 blainesmith@email.arizona.edu

Dr. Lauren Barth-Cohen, Assistant Professor of Science and Math Education, Department of Educational Psychology, University of Utah, Salt Lake City, UT, Tel: 801-581-7148 Lauren.BarthCohen@Utah.edu

Dr. Mary Beth Rosson, Professor and associate dean of Information Sciences and Technology, The Pennsylvania State University, State College, PA, Tel: 814-880-6856 mrosson@psu.edu