ZHEN BAI

Current Position: Assistant Professor, Department of Computer Science, University of Rochester
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Zhen designs and develops embodied and intelligent learning environments to promote cognitive (e.g., theory-of-mind, language), STEM (e.g., AI literacy, scientific inquiry) and social-emotional (e.g., curiosity, communication) learning, through Augmented and Virtual Reality (AR/VR), Tangible User Interface (TUI), Embodied Conversational Agents and multimodal technologies. Zhen's research is grounded in theories from cognitive, developmental, learning and social sciences, and adopts the community-centered participatory design approach to tackle pressing challenges in learning and development faced by children of all needs and backgrounds.

Current Appointment

Assistant Professor — **Rochester, NY**
Department of Computer Science — Aug 2018-present
University of Rochester

Affiliated appointments: Goergen Institute for Data Science and Artificial Intelligence, Center for Language Sciences

Education

University of Cambridge — **Cambridge, UK**
Ph.D. in Computer Science (The Graphics & Interaction Group) — 2015
Advisor: Alan F. Blackwell
Thesis: Augmented Reality interfaces for symbolic play in early childhood.

Peking University — **Beijing, China**
M.Eng. in Software Engineering — 2009

Beijing University of Technology — **Beijing, China**
B.Sc. in Computer Science — 2006

Research Experience

Assistant Professor, Department of Computer Science, University of Rochester — Aug 2018 – present
Co-lead the ROCHCI group with research focus on embodied and intelligent technologies that support K-12 AI literacy, ASL communication and learning for hearing families with DHH children, collaborative reasoning, and human-AI collaboration to harness human autonomy and creating innovative learning experiences.

Post-doctoral Fellow, HCII/LTI, Carnegie Mellon University — Oct 2015 – Jul 2018
PI Collaborators: Dr. Justine Cassell, Dr. Jessica Hammer, Dr. Louis-Philippe Morency
Lead the project "Sensing Curiosity in Play and Responding" (SCIPR) that investigated how social factors influence curiosity in scientific inquiry for elementary and middle school students who are underrepresent in STEM, and developed a 3D virtual peer and a tangible tabletop game that enables real-time elicitation of curiosity in small group learning.

PhD, Graphics & Interaction Group, University of Cambridge — Oct 2010 – April 2015
Supervisor: Dr. Alan Blackwell and Dr. George Coulouris
Designed and developed Augmented Reality and tangible systems that promote theory-of-mind and imagination for young children with and without autism during make-believe play and articulated key AR design guidelines and evaluation considerations for young children with diverse developmental abilities.

Selected Awards and Honors

Asaro Biggar Family Fellow in Data Science 2023-2026

University of Rochester Faculty Honors Recognition Award 2023

NSF CAREER Award 2023

Google Inclusion Research Award 2021

Google exploreCSR Award (Co-PI: Ehsan Hoque) 2020

Sykes Engineering Faculty Award 2018-2019

Semifinalist of 2018 National Academy of Education/Spencer Postdoctoral Fellowship 2018

Best paper nominations

- *Best paper nomination, International Conference on Artificial Intelligence in Education (AIED), 2025*
- *Best Late-Break-Result, nomination International Conference on Artificial Intelligence in Education (AIED), 2025*
- *Best paper nomination, ACM Interaction Design and Children Conference (IDC), 2022*
- *Best paper & best student paper nomination, International Conference on Artificial Intelligence in Education (AIED), 2025*
- *Best paper nomination, European Conference on Technology Enhanced Learning (EC-TEL), 2017*
- *Best paper nomination, International Symposium on Mixed and Augmented Reality (ISMAR), 2013*

Mentoring award

- *CRA Outstanding Undergraduate Researcher, Honorable Mention (2020 and 2021), Excellence in Undergraduate Research award (2021), Ashely Tenesaca.*

Lundgren Research Award 2014

Cambridge Philosophical Society Research Studentship 2013-2014

Finalist of 2012 Qualcomm Innovation Fellowship 2012

Raymond and Helen Kwok Scholarship 2010-2013

Cambridge Overseas Trust Scholarship 2010-2013

Selected Publications

Student authors are bolded. CHI, IDC, and ASSETS are top venues for Human-Computer Interaction, Child-Computer Interaction, and Accessibility are. ISLS (hosts ICSL, CSCL), AIED, and ijAIED are top venues for Learning Technologies.

Book Chapter

Daley, M., Bai, Z, Borasi, R., Miller, D. (2021). Chapter 22, Machine Learning - a new lens for integrating computational thinking and science in the high school classroom. Age of Inference: Cultivating a Scientific Mindset. Short P, Henson H, McConnell J, editors. Charlotte, NC: Information Age Publishing.

Peer-reviewed Journal Articles

TOCE (Minor revision) **Zhou, X**., **Gong, Y**., Bai, Z. Iterative Design of Embodied and Analogical Learning Experiences for Teaching AI Literacy to Children. ACM Transactions on Computing Education (TOCE).

ijHCS **Zhou, X., Gong, Y.**, Bai, Z. (2025). Co-Design Analogical and Embodied Representations with Children for Child-Centered AI Learning Experiences. International Journal of Human-Computer Studies (ijHCS). Special Issue on "Child-Centered AI". Volume 199, May 2025, 103462. 1-15.

ijAIED **Tang, J., Zhou, X., Wan, X.**, Daley, M., & Bai, Z. (2022). ML4STEM Professional Development Program: Enriching K-12 STEM Teaching with Machine Learning. International Journal of Artificial Intelligence in Education (ijAIED), 1-40.

TVCG Bai, Z., Blackwell, A.F., Coulouris, G. (2015). Using Augmented Reality to Elicit Pretend Play for Children with Autism. (2015) IEEE Transactions on Visualization and Computer Graphics, vol.21, no.5, pages 598-610. [**Invited**]

IWC Bai, Z., Blackwell, A.F. (2012). Analytic Review of Usability Evaluation in ISMAR. Interacting with Computers, 24(6), pages 450-460.

Peer-reviewed Conference Proceedings

ASSETS'25 (To appear) **Liu, X., Cheng, H.**, Chastel, G., Chastel, M., Bai. Z. CoSignPlay: A Collaborative Approach to Learning Non-Manual Signs in ASL for Hearing Families with Deaf Children. In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility.

ASSETS'25 (To appear) **Li, Y.**, Willis, A., Bai, Z. (2025). RhymASL: An Interactive Rhyming ASL Story Generator. In Proceedings of the 27th International ACM SIGACCESS Conference on Computers and Accessibility.

AIED'25 **Wu, S., Wang, H.**, Bai, Z. (2025, July) AGen: Personalized Analogy Generation through Large Language Model. In International Conference on Artificial Intelligence in Education (pp. 242-249). Cham: Springer Nature Switzerland. [***Best Late-breaking nomination***]

AIED'25 **Zhou, X., Lyu, H., Sa, Y., Li, M.**, Sarkar, A., Luo, J., Daley, M., and Bai, Z. (2025, July). Empower Secondary School Teachers to Create ML-Supported Inquiry-Based Learning Activities. In International Conference on Artificial Intelligence in Education (pp. 150-164). Cham: Springer Nature Switzerland. [***Best Paper nomination***]

ISLS'25 **Zhou, X., Gong, Y., Yu, Y., Zhang, Y.**, Smith, J., Bai, Z. Design AI for My Community: A Case Study of Collaborative Learning in a Freedom-to-Read Summer Camp. In Proceedings of the 19th International Conference of the Learning Sciences-ICLS 2025, pp. 1295-1299. International Society of the Learning Sciences.

IDC'25 Ragone, G., Bai, Z., Good, J., Guneysu, A., Yadollahi, E., Child-centered Interaction and Trust in Conversational AI. 2025 Annual ACM Interaction Design and Children Conference (IDC'25) (pp. 1235–1238).

IDC'25 **Li, Y., Wang, H., Hossain, E., Mann M., Yu, J., Newman, K.S., Bao, A.**, Willis A., Kurumada, C., Hall, W., Bai, Z. Leveraging Usefulness and Autonomy: Designing AI-Mediated ASL Communication Between Hearing Parents and Deaf Children. 2025 Annual ACM Interaction Design and Children Conference (IDC'25) (pp. 512 - 526).

CHI EA'25 **Liu, X., Cheng, H.**, Bai, Z., Chastel, M., Chastel, G. (2025, April). An Educational Game Prototype for Avatar-based Non-Manual Sign Learning in American Sign Language. Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (pp. 1-6).

CHI'25 **Zhou, X., Zhang, Y., Jiang, Y., Gong, Y., Zhang, C.**, Antle, N. A., Bai, Z. (2025, April). Briteller: Shining a Light on AI Recommendation for Children. 2025 ACM CHI Conference on Human Factors in Computing Systems (pp. 1-30).

IDC'24 **Zhou, X., Zhou, Y., Gong, Y., Cai, Z., Qiu, A., Xiao, Q.,** Antle, A., Bai, Z. (2024, June). "Bee and I need diversity!" Break Filter Bubbles in Recommendation Systems through Embodied AI Learning. In Proceedings of the 23rd Annual ACM Interaction Design and Children Conference (pp. 44-61).

CHI EA'24 **Zhou, X., Xiong, P., Xiao, Q.**, Bai, Z. (2024, May). OptiDot: An Optical Interface for Children to Explore Dot Product and AI Recommendation. In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (pp. 1-7).

CHI EA'24 **Zhou, X., Tang, J., Lyu, H., Liu, X., Zhang, Z., Qin, L., Au, F.**, Sarkar, A., Bai, Z. (2024, May). Creating an authoring tool for K-12 teachers to design ML-supported scientific inquiry learning. In Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (pp. 1-7).

ISLS'24 **Gong, Y., Zhou, X., Zhou, Y.**, Luehmann, A., Han, Y., Bai, Z. (2024, June). Approaching "Filter Bubble" in Recommendation Systems: A Transformative AI Literacy Learning Experience. In Proceedings of the 18th International Conference of the Learning Sciences-ICLS 2024, pp. 490-497. International Society of the Learning Sciences.

ISLS'24 **Zhou, X., Tang, J., Xiao, Q., Zhou Y.**, Bai, Z. (2024, June). Supporting Multidimensional Data Analysis for High-School Students in the Era of Machine Learning. In Proceedings of the 18th International Conference of the Learning Sciences-ICLS 2024, pp. 1255-1258. International Society of the Learning Sciences.

ASSETS'23 **Hossain, E., Newman, K., Bao, A., Mann, M.**, Kurumada, C., Hall, W., Bai, Z. (2023, November). Supporting ASL Communication Between Hearing Parents and Deaf Children. The 25th International ACM SIGACCESS Conference on Computers and Accessibility (pp. 1-5).

CHI EA'23 **Xu, E., Wang, H.,** and Bai, Z. (2023, April). Engage AI and Child in Explanatory Dialogue on Commonsense Reasoning. In Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems (pp. 1-8).

ASSETS'22 **Hossain, E., Cahoon, M., Liu, Y.**, Kurumada, C., and Bai, Z. (2022, October). Context-responsive ASL Recommendation for Parent-Child Interaction. The 24th International ACM SIGACCESS Conference on Computers and Accessibility (pp. 1-5).

ISLS'22 **Zhou, X., Tang, J., Guo, B., Lyu, H.**, and Bai, Z. (2022, June). Challenges and Design Opportunities in Data Analysis for ML-Empowered Scientific Inquiry - Insights from a Teacher Professional Development Study. The International Society of the Learning Sciences Annual Meeting (ISLS) (pp. 847-854).

IDC'22 Bai, Z., **Codick, E., Tenesaca, A., Hu, W., Yu, X., Hao, P.**, Kurumada, C. & Hall, W. (2022, June). Signing-on-the-Fly: Technology Preferences to Reduce Communication Gap between Hearing Parents and Deaf Children. In Proceedings of the 21st Annual ACM Interaction Design and Children Conference (pp. 26-36). [***Best Paper nomination***]

IDC EA'21 **Zhou, X., Li, K., Munawar, A. M.**, Bai, Z. (2021, June). Scaffolding Design to Bridge the Gaps between Machine Learning and Scientific Discovery for K-12 STEM Education. In Interaction Design and Children (pp. 604-609).

AIED'21 **Zhou, X., Tang, J.**, Bai, Z. (2021, June) "Now, I Want to Teach it for Real!": Introducing Machine Learning as a Scientific Discovery Tool for K-12 Teachers. 22nd International Conference on Artificial Intelligence in Education (pp. 486-499). Springer, Cham. [***Best Paper nomination***] [***Best Student Paper nomination***]

IDC'20 **Wan, X., Zhou, X., Ye, Z., Mortensen, C. K.**, and Bai, Z. (2020, June). SmileyCluster: supporting accessible machine learning in K-12 scientific discovery. In Proceedings of the Interaction Design and Children Conference (pp. 23-35).

ISMAR'19 Adjunct **Tenesaca, A., Oh, J. Y., Lee, C., Hu, W.,** and Bai, Z. (2019, October). Augmenting Communication Between Hearing Parents and Deaf Children. In 2019 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct) (pp. 431-434). IEEE.

ACII'19 **Samrose, S., Chu,W., He, C., Gao, Y., Shahrin, S. S.**, Bai, Z., Hoque, M. Visual Cues for Disrespectful Conversation Analysis. Eighth International Conference on Affective Computing and Intelligent Interaction, ACII 2019, Cambridge, UK. Sept. 3-5, 2019.

CHI EA'19 **Holmes, J. R., To, A., Zhang, F., Park, S. E., Ali, S.**, Bai, Z., Kaufman, G. & Hammer, J. (2019, April). A Good Scare: Leveraging Game Theming and Narrative to Impact Player Experience. In Extended abstracts of the 2019 chi conference on human factors in computing systems, pp. 1-6. 2019.

IVA'18 **Paranjape, B., Bin, Y.**, Bai, Z., Hammer, J., and Cassell, J. (2018). Towards Automatic Generation of Peer-Targeted Science Talk in a Curiosity-Evoking Virtual Agent. In Proc. 18th ACM International Conference on Intelligent Virtual Agents (pp. 71-78). ACM.

IACMP' 18 **Ali, S., To, A.,** Bai, Z., Holmes, J., Fath, E., Kaufman, G., Hammer, J. (2018). From Game Design to Goal Delineation in Tandem Transformational Game Design. In Proc. International Academic Conference on Meaningful Play 2018 (pp. 420- 439). ETC Press.

AIED'18 **Paranjape, B.**, Bai, Z., and Cassell, J. (2018). Predicting the Temporal and Social Dynamics of Curiosity in Small Group Learning. 19th International Conference on Artificial Intelligence in Education (pp. 420-435). Springer, Cham.

EC-TEL'17 **Sinha, T.**, Bai, Z., Cassell, J. (2017). A New Theoretical Framework for Curiosity for Learning in Social Contexts. 12th European Conference on Technology Enhanced Learning. (pp. 254-269). Springer, Cham. [Accept rate: 25.3%] [***Best Paper nomination***]

EC-TEL'17 **Sinha, T.**, Bai, Z., Cassell, J. (2017). Curious Minds Wonder Alike: Studying Multimodal Behavioral Dynamics to Design Social Scaffolding of Curiosity. In European conference on technology enhanced learning (pp. 270-285). Springer, Cham. [Accept rate: 25.3%]

CHI'15 Bai, Z., Blackwell, A.F., Coulouris, G. (2015). Exploring Expressive Augmented Reality: The FingAR Puppet System for Social Pretend Play. In Proc. ACM CHI Conference on Human Factors in Computing Systems, Seoul, Republic of Korea, April 18-23, 2015, pages 1035-1044. [Accept rate: ~23%]

ISMAR'13 Bai, Z., Blackwell, A.F., Coulouris, G. (2013). Through the Looking Glass: Pretend Play for Children with Autism. In Proc. 12th International Symposium on Mixed and Augmented Reality (ISMAR), 1-4 October 2013, Adelaide, Australia, pages 49-58. [Accept rate: ~3%] [***Best Paper nomination***]

ISMAR'13 Adjunct Bai, Z., Blackwell, A.F. (2013). See-through Window vs. Magic Mirror: A Comparison in Supporting Visual-Motor Tasks. In Proc. 12th International Symposium on Mixed and Augmented Reality (ISMAR), pp. 239-240.

CHI EA'13 Bai, Z., Blackwell, A.F., Coulouris, G. (2013). Can We Augment Reality with "Mental Images" to Elicit Pretend Play? A Usability Study. In Proc. ACM CHI Extended Abstract 2013, 27 April - 2 May 2, Paris, France, pp. 1-6.

ISMAR'12 Adjunct — Bai, Z., Blackwell, A.F., Coulouris, G. (2012). Making Pretense Visible and Graspable: An Augmented Reality Approach to Promote Pretend Play. In 2012 IEEE international symposium on mixed and augmented reality (ISMAR) (pp. 267-268). IEEE. [Accept rate: ~28%]

Peer-reviewed Workshop Papers

AIED'25 — Bai, Z. Integrating AI Literacy with K-12 STEM Education: Lessons from Three Projects. The AIED 2025 workshop on AI Literacy For All: 1st International Workshop on AI Literacy Education For All. July 2025.

CHI'23 — Bai, Z., Judd, F., Polinsky, N., Yadollahi, E. Participatory Design of AI with Children: Reflections on IDC Design Challenge. The CHI 2023 workshop on "Child-Centred AI Design: Definition, Operation, and Considerations". May 2023.

AAAI'23 — **Zhou, X., Lyu, H.**, Luo, J., Bai, Z. ML-SD Modeling: How Machine Learning Can Support Scientific Discovery Learning for K-12 STEM Education. The AAAI 2023 Workshop on AI4EDU: AI for Education. February 2023.

AAAI'23 — **Wang, H., Xu, E., Liu, P., Meng, Z.**, Bai, Z. (2023, Februry). Contextualized Multi-Step Commonsense Reasoning through Context Extension. The AAAI 2023 Workshop on Representation Learning for Responsible Human-Centric AI.

EDM'21 — **Wan, X., Tang, J., Zhou, X.**, Bai, Z. Exploratory Process Analysis of Teacher Learning of AI Integration through Collaborative Design. (2021, June). 5th Educational Data Mining in Computer Science Education (CSEDM) Workshop, Joint Proceedings of the Workshops at the International Conference on Educational Data Mining 2021.

AIED'20 — **Zhou, X., Tang, J., Mushtaq, S., Wan, X.**, and Bai, Z. Empowering Teachers to Integrate Machine Learning into K-12 Scientific Discovery. International Workshop on Education in Artificial Intelligence K-12 (EduAI-20).

AIED'19 — **Zhou, X., Tang, J., Mushtaq, S., Wan, X.** and Zhen Bai. FaceOverlay: Supporting Learning of Cluster Analysis for Scientific Discovery. "AIED4K12" workshop at the 20th International Conference on Artificial Intelligence in Education. Chicago, USA, Jun 25th - 29th 2019.

CHI'17 — **Sinha, T.**, Bai, Z., Cassell, J. A Theoretical Framework of Curiosity in Small Group Learning. "Designing for Curiosity" workshop at ACM CHI Conference on Human Factors in Computing Systems, Denver, USA, May 6-11, 2017.

CHI'15 — Bai, Z. Design Considerations of Augmented Reality Systems for Child Development through Play, "Supporting Children to Engage in Play for Wellbeing" workshop at ACM CHI Conference on Human Factors in Computing Systems, Seoul, Republic of Korea, April 18-23, 2015.

Invited Talks

- *Embodied Learning for K-12 AI Literacy*. 2024 IEEE Western New York Image and Signal Processing Workshop (WNYISPW), Rochester. — Nov 2024
- *Demystify AI for K-12 Learners*. Invited talk at Carnegie Mellon University Learning Science Seminar, Pittsburgh. — Oct 2024
- *K-12 AI Literacy.* AI Horizon Institute Learning Series Talk, Rochester. — Oct 2024
- *Integrating AI in K-12 STEM Education*. Invited presentation at the Center for Integrative Research in computing and Learning Science (CIRCLS convening). Alexandra VA. — Nov 2023
- *Signing on-the Fly: Augmenting Communication Between Hearing Parents and Deaf Children*. Invited talk at Hajim Dean Inaugaral Community Conversation. Rochester. — Dec 2022

- *Augmenting Immersive Language Environment for Deaf Children in Early Childhood*. Google. Mountain View. June 2022
- *A Journey for Inclusive Learning.* Stevens Institute Woman@SSE Seminar. Oct 2021
- *TIPs-Augmenting Early Sign Language Exposure for Hearing Parent-Deaf Child Interaction.* RIT CAIR Research Group. May 2020
- *Augmenting Social Reality for Lifelong Learning.* Tsinghua University Pervasive Human-Computer Interaction Group. Beijing, China. Aug 2019
- *Augmenting Reality in the Social Realm*. Light and Sound Interactive. Augmented and Virtual Reality Track Speaker. Rochester, USA. Jun 2019
- *Augmenting Social Reality for Lifelong Learning*. Goergen Institute Summer Colloquium. Rochester, USA. Jun 2019
- *Fostering Curiosity through Peer-support in Science Learning.* Human Computer Interaction Institute Seminar, Carnegie Mellon University. Oct 2016
- *Immersion through Augmented Reality: Encouraging Pretend Play for Children with Autism.* Presented at Children and Youth Research Centre Keyword Seminar Series, Queensland University of Technology, Brisbane, Australia. Sept 2013
- *An Augmented Reality Approach to Promote Pretend Play*, Human-Computer Interaction Group, Microsoft Research Asia, Beijing, China. June 2013
- *Augmenting Imagination for Children with Autism*, Health Systems Institute, Georgia Institute of Technology, Atlanta, USA. Nov 2012

Conference Presentations

- *BeeCurious: A Minecraft-Based Testbed for Peer Agents in Exploratory Learning Environments. Interactive-Extended*. 26th International Conference on Artificial Intelligence in Education (AIED'25), Palermo, Italy. Jul 2025
- *Enhancing K–12 Machine Learning Experiences: Integrating ML4Inq into CODAP*. Interactive-Extended. 26th International Conference on Artificial Intelligence in Education (AIED'25), Palermo, Italy. Jul 2025
- *Leveraging Usefulness and Autonomy: Designing AI-Mediated ASL Communication Between Hearing Parents and Deaf Children.* 2025 Annual ACM Interaction Design and Children Conference (IDC'25). Reykjavik, Iceland. Jun 2025
- *"Bee and I Need Diversity!" Break Filter Bubbles in Recommendation Systems through Embodied AI Learning. Paper* presentation at 23rd Annual ACM Interaction Design and Children Conference. June 2024
- *Engage AI and Child in Explanatory Dialogue on Commonsense Reasoning.* Poster presentation at 2023 CHI Conference on Human Factors in Computing Systems. Hamburg, Germany. May 2023
- *Signing-on-the-Fly: Technology Preferences to Reduce Communication Gap between Hearing Parents and Deaf Children.* Paper presentation at ACM Interaction Design and Children (IDC) Conference, Online. June 2022

- *Augmenting Communication Between Hearing Parents and Deaf Children.* In 2019 IEEE International Symposium on Mixed and Augmented Reality Workshop Mixed Reality and Accessibility. Beijing, China. Oct 2019
- *FaceOverlay: Supporting Learning of Cluster Analysis for Scientific Discovery*. "AIED4K12" workshop at the 20th International Conference on Artificial Intelligence in Education. Chicago, USA. Jun 2019
- *Predicting the Temporal and Social Dynamics of Curiosity in Small Group Learning*. 19th International Conference on Artificial Intelligence in Education. London, UK. Jun 2018
- *New Theoretical Framework for Curiosity for Learning in Social Contexts*. 12th European Conference on Technology Enhanced Learning. Tallinn, Estonia. Sept 2017
- *A Theoretical Framework of Curiosity in Small Group Learning.* "Designing for Curiosity" workshop at ACM CHI Conference on Human Factors in Computing Systems, Denver, USA. May 2017
- *Design Considerations of Augmented Reality Systems for Child Development through Play*, "Supporting Children to Engage in Play for Wellbeing" workshop at ACM CHI Conference on Human Factors in Computing Systems, Seoul, Republic of Korea. April 2015

PhD Thesis

Bai, Z. Augmented Reality interfaces for symbolic play in early childhood. September 2015. Cambridge.

Archive Papers

Sinha, T., Bai, Z., & Cassell, J. (2021, March 22). *A Novel Multimodal Approach for Studying the Dynamics of Curiosity in Small Group Learning*. https://doi.org/10.35542/osf.io/rfxwg.

Funding

External Federal Funding

- NSF Developing STEM Teachers for High-need Schools To Support the Implementation of Computer Science Standards (#2344636). $1,199,823. Co-PI (with Raffaella Borasi (PI), April Luehmann, Sharon Mason, Zenon Borys.) 2024-2029
- NSF Student Travel Grant for 2024 IEEE International Symposium on Mixed and Augmented Reality (ISMAR) Doctoral Consortium (#2451963). $6,080. PI. 2024-2025
- NSF CAREER (RETTL): Towards Embodied Learning for K-12 Machine Learning (ML) Education. $732,923. PI. 2023-2028
- NSF EAGER (RETTL): Cultivating Scientific Mindsets in the Machine Learning Era (#2225227), $295,563. PI (with Raffaella Borasi, Jiebo Luo, Michael Daley). 2022-2024
- NSF NRT-HDR: Interdisciplinary Graduate Training in the Science, Technology, and Applications of Augmented and Virtual Reality (#1922591), $1,560,000. Co-PI (with Mujdat, Cetin (PI), Jannick P Rolland, Michele Rucci). 2019-2025

External Industry Funding

- Google Inclusion Research Award, Augmenting Immersive Language Environment for Deaf Children in Early Childhood, $60,000. PI. 2021
- Google exploreCSR Award, $18,000. Co-PI (with Ehsan Hoque (PI)). 2020

Internal Funding

- University of Rochester Research Award. Level Up Your Toolkit: Introduce Machine Learning for Secondary School Education. $50,000. PI (with Xiaofei Zhou, Michael Daley). 2025-2026
- Asaro Biggar Family Fellow in Data Science. $60,000. PI. 2023-2026
- Goergen Institute of Data Science Seed Grant: Pedagogical Agent for Supporting Relational Reasoning in Biology Gameplay. $30,000. PI (with Dr. Karl Rosengren (BCS, Psychology), Dr. Isobel Heck (Psychology)). 2023-2024
- Pump Primer II: A novel dataset of multimodal interaction between parents and deaf children. $44,900. Co-PI (with Chigusa Kurumada (PI), Wyatte Hall). 2022-2023
- Goergen Institute of Data Science Seed Grant: Building a Multi-Step Commonsense Reasoning System for Story Understanding. $19,600. PI (with Len Schubert). 2022-2023
- University of Rochester Research Award, Promoting Inclusive Conversation in Small-Group Learning, $38,546. PI (with Ehsan Hoque). 2022-2023
- Wadsworth C. Sykes Faculty Engineering Award, $1800. PI 2018-2019

Teaching Experience

CSC 216/416: AR/VR Interaction Design
University of Rochester, Fall 2024, Spring 2024, Fall 2022, Fall 2021, Fall 2019
Instructor for the undergraduate and graduate level course that provides an introductory overview of the concepts, principles, methods and special topics of AR, VR and related technologies.

CSC 211: Introduction to Human-Computer Interaction
University of Rochester, Spring 2025, Spring 2023, Spring 2022, Fall 2020
Instructor for the undergraduate-level course that introduces HCI origins, guidelines, user-centered design and evaluation methods, and special topics. Required course for the UR User Experience (UX) Certificate Program.

CSC 413: Introduction to Augmented and Virtual Reality
University of Rochester, Fall 2022, 2021, 2020
Instructor for the graduate-level course that introduces AR/VR interaction technologies and design approaches.

ECE 501 - Practicum in AR/VR
University of Rochester, Fall 2022, Fall 2023, Fall 2024
Mentor five groups of PhD students for the project-based practicum course to explore innovation of AR/VR technologies in domains like education, assistive technology, and music.

CSC 414: Selected Topics in Augmented and Virtual Reality
University of Rochester, Spring 2022
Instructor for the "3D interfaces and interaction" module of the graduate level course that introduces state-of-the-art technologies and concepts of 3D user interfaces.

CSC 531: Practicum in Data-Enabled Research into Human Behavior and Its Cognitive and Neural Mechanisms
University of Rochester, Spring 2020
Instructor for the graduate students work in mixed teams of Computer Science, Data Science and Brain and Cognitive Science background to develop an artifact that addresses a research question or infrastructure need.

CSC 494/CSC 574: Future User Interfaces
University of Rochester, Fall 2018

Instructor for the undergraduate- and graduate-level seminar course that introduces embodied technologies such as AR/VR, tangible user interface, ubiquitous computing, embodied conversational agent.

Professional Service

Organization Committee

ACM Interaction Design and Children (IDC) Conference**,** Student Volunteer Chair	2026
Steering committee for Interactional Symposium of Mixed and Augmented Reality (ISMAR).	2024
Interactional Symposium of Mixed and Augmented Reality (ISMAR), Doctoral Consortium Chair	2024
Steering committee for Interactional Symposium of Mixed and Augmented Reality (ISMAR)	2023
Center for Integrative Research in Computing and Learning Science (CIRCLS) Convening'23	2023
ACM Interaction Design and Children (IDC) Conference**,** Research and Design Competition Chair	2023

Program Committee

International Conference on Affective Computing and Intelligent Interaction (ACII)	2024
CHI Conference on Human Factors in Computing Systems – Associate Chair for "Learning, Education, and Families" subcommittee	2023-2025
International Conference on Hybrid Human-Artificial Intelligence (HHAI)	2023
Global Chinese Conference on Computers in Education (GCCCE 2023)	2023
IEEE International Symposium on Mixed and Augmented Reality (ISMAR)	2021, 2024
International conference on Artificial Intelligence in Education	2020
AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI)	2021-2024
Grace Hopper Conference VR/AR/MR Track	2021

Workshop Committee Member

Child-centered Interaction and Trust in Conversational AI. ACM Interaction Design and Children (IDC).	2024

Journal Editor

Guest Editor for the Special Issue on Child-Centred AI, International Journal of Human-Computer Studies	2024

Conference Panelist

IEEE International Symposium on Mixed and Augmented Reality (ISMAR), Future Faculty Forum (F3)- Challenges and Opportunities of Interdisciplinary Research	2024
Augmented World Expo (AWE) USA conference, "The Value of User Experience in XR" panelist.	2022
IEEE International Symposium on Mixed and Augmented Reality (ISMAR) Doctoral Consortium Mentor Panel	2020

Journal and Conference Reviewer

IEEE Transactions on Learning Technologies (2017), Research in Developmental Disabilities (2017, 2018), Transactions on Computer-Human Interaction (2019), International Journal of Human-Computer Studies (2024), International Journal of Child-Computer Interaction (2025).

ISMAR (2013-15, 2021, 2023, 2024), CHI (2011, 2014-15, 2017-25), AIED (2019-22), TEI (2014, 2018-19), DIS (2014, 2022), IDC (2014, 2017, 2019, 2022, 2025), RO-MAN (2016), CHI Play (2017, 2024), HRI (2018-19), ECTEL(2018), ACII (2019, 2023, 2024), Connected Leering (2019), ICMI (2019), EAAI (2021-2024), CSCW(2022), ISLS (2022), HHAI (2023), IMWUT (2023), Connected Learning (2019), HHAI (2023).

NSF Grants Reviewer

Cyberlearning for Work at the Human-Technology Frontier, Advancing Informal STEM Learning (AISL), Innovative Technology Experiences for Students and Teachers (ITEST), Discovery Research PreK-12 (DRK-12), Research on Innovative Technologies for Enhanced Learning (RITEL), and CISE Core.

University Service

Diversity committee co-chair (CS, University of Rochester)	2018-present
PhD admission committee (CS, University of Rochester)	2018-present
Faculty recruiting committee (CS, University of Rochester)	2021-22,2024
CS colloquium chair (CS, University of Rochester)	2019
Department IRB review committee (CS, University of Rochester)	2020-present
Department of Mathematics, chair search committee (University of Rochester)	2024-2025
Data Science Master admission committee (GIDS&AI, University of Rochester)	2019-2021
Computational Reality working group co-chair (GIDS&A, University of Rochester)	2019-2021
Advisory committee to the River Campus Libraries (University of Rochester)	2021-present
Hajim Reimagine Education Working Group (Hajim School, University of Rochester)	2021
Center for Learning in the Digital Age (LiDA) (University of Rochester)	2019-present

Community Service

GEM Fellowship Judging Committee	2020
women@cl committee member (University of Cambridge)	2010-2014
Cambridge University Disability Resource Centre, tech consultant	2015
Science and Engineering Experiments for Kids (University of Cambridge)	2011-2012
National Autistic Society supporting group, Cambridge, UK	2012-2014
Romsey Mill Playgroup, Cambridge, UK	2014-2015
Chain Reaction Contraption Contest Judge, Carnegie Science Museum, Pittsburgh	2015

Outreach Activities

"ROC AI" workshop - A multi-day workshop that offering playful learning experiences using innovative AR/VR, games, and visualization technologies developed in my group to help middle school and high school students understand AI technologies and concepts and thinking critically of a future for AI that benefits their own communities.

- Freedom Scholars Learning Center 2023-2025
- UR Upward Bound 2022-2025

- Goergen Institute of Data Science and AI 2019, 2024
- Sodus Environmental Justice 2023

Community outreach events - Demonstrate learning and assistive technologies built in my group in to promote AI and AR/VR literacy, and immersive ASL environments for families with DHH children.

- National Museum of Play: "Women in Game" Celebration, "Get in the Game!" initiative, Deaf Day of Play 2022-2024
- Rochester Museum and Science Center: Winter Break Camp and weekend tabling. 2025

Professional Development and Certificate

Certificate in Fostering A Culture Of Belonging by ACUE (Association of College and University Educators): This certificate signifies the completion of a 5-module course in inclusive teaching practices requiring the implementation of evidence-based instructional approaches and demonstrating comprehensive knowledge and skills in Managing the Impact of Biases, Reducing Microaggressions, Addressing Imposter Phenomenon and Stereotype Threat, Cultivating an Inclusive Environment. June 2023

CRA-W Career Mentoring Workshop Nov 2018

Student Supervision at University of Rochester

Current PhD Advisees

P5. Erfan Farhadi (CS, University of Rochester) Fall 2024 - present
P4. Shutong Wu (CS, University of Rochester) Fall 2024 - present
P3. James Spann (CS, University of Rochester) Fall 2023 - present
P2. Hecong Wang (CS, University of Rochester) Fall 2022 - present
P1. Yifan Li (CS, University of Rochester) Fall 2022 - present

Graduated PhD advisees

P1. Xiaofei Zhou (CS, University of Rochester) Fall 2019 – Spring 2025
Thesis: Embodied Interactions with Data, Algorithms, and Ethics in AI Learning Experiences for Children

PhD Alumni

P3. Yushan Zhou (CS, University of Rochester, left due to visa) Fall 2023
P2. Ekram Hossain (CS, University of Rochester, left with masters) Fall 2021 – Fall 2023
P1. Zheng Zhang (CS, University of Rochester, left with masters) Fall 2019 – Fall 2021

PhD collaborator

H7. Yunfang Gong (Education, University of Rochester) Spring 2023-Fall 2024
H6. Pei Xiong (Optics, University of Rochester) Fall 2022 – Spring 2023
H5. Beilei Guo (Education, University of Rochester) Fall 2021 – Spring 2022
H4. Hanjia Lyu (CS, University of Rochester) Fall 2021 - present
H3. Erqian Xu (Education, University of Rochester) Spring 2020 – Spring 2022
H2. Jingwan Tang (Education, University of Rochester) Spring 2020 – Spring 2024
H1. Xiaoyu Wan (Education, University of Rochester) Spring 2019 – Fall 2021

PhD Committee member

D12. Mojtaba Heydari (Electrical and Computer Engineering, UR) 2024
D11. Masum Hasan (CS, University of Rochester) 2024

D10.	Eleni Patelaki (Biomedical Engineering, UR)	2023
D9.	Tre DiPassio (Electrical and Computer Engineering, UR)	2022
D8.	Kurtis Haut (CS, University of Rochester)	2022
D7.	Weijian Li (CS, University of Rochester)	2021
D6.	Samiha Samrose (CS, University of Rochester)	2021
D5.	Rainier Barrett (Chemical Engineering, University of Rochester)	2020
D4.	Rafayet Ali (CS, University of Rochester)	2020
D3.	Daniel Nikolov (Optics, University of Rochester)	2020
D2.	Xiong Zhang (CS, University of Rochester)	2020
D1.	Yichi Zhang (Electrical and Computer Engineering, UR)	2019

Master advisees

M18.	Yi Zhang (UC Irvine, now PhD in UIUC)	Summer 2024-Fall 2025
M17.	Yichen Yu (CS, UR)	Summer 2024-Fall 2024
M16.	Silin Chen (CS, UR)	Fall 2023, Spring 2025
M15.	Savannah Tellander (Experimental Psychology, RIT)	Summer 2024
M14.	Hongbo Liu (Quantitative Methods in The Social Science, Columbia)	Summer 2023-Fall 2023
M13.	Zhenhao Zhang (CS, University of Rochester)	Summer 2022-Spring 2023
M12.	Lichen Qin (CS, University of Rochester)	Summer 2022- Spring 2023
M11.	Zhenyao Cai (Educational Technology, Teachers College Columbia, now PhD in UC Irvine)	Summer 2022
M10.	Yushan Zhou (CS, University of Rochester)	Spring 2022- Fall 2023
M9.	Ekram Hossain (CS, University of Rochester)	Fall 2021 – Fall 2023
M8.	Lizzie Codick (Rochester Bridges to the Doctorate for Deaf and Hard-of-Hearing Scholars, HCI, RIT)	Summer 2021
M7.	Richie Magnotti (CS, University of Rochester, now PhD student at Rutgers University)	Fall 2019-Fall 2020
M6.	Xingxing Li (ECE, University of Rochester)	Fall 2019 – Spring 2020
M5.	Jaco Lee (Visual Communication Design, RIT)	Summer 2020
M4.	Zheng Zhang (CS, University of Rochester, now PhD in Notre Dame)	Fall 2019 – Fall 2021
M3.	Zaiqiao Ye (CS, Université Paris-Sud Paris, now PhD in Indiana University Bloomington)	Summer 2019
M2.	Yubin Ge (CS, University of Pittsburgh, now PhD in UIUC)	Spring 2019
M1.	Wei Zhang (CS, University of Rochester)	Spring 2019

Undergraduate honored thesis

H1.	Hecong Wang. Undergraduate Thesis: *Multi-Step Commonsense Reasoning through Context Augmentation and Backtracing*	Spring 2022

Undergraduate advisees

U53.	Yuanzhu (Jeffery) Li (CS, Math, UR)	Summer 2024
U52.	Luka Avni (CS-Discover Grant, CS, UR)	Spring 2024-present
U51.	Kenneth Fei (Schwartz Discover Grant CS, UR)	Spring 2024-present
U50.	Joshua Jones (Schwartz Discover Grant, BCS, UR)	Spring 2024-Summer 2024
U49.	Vuong Ho (CS, UR)	Fall 2024-Spring 2025
U48.	Emily Jeong (Research & Innovation Grant, CS, UR)	Spring 2023-Spring 2025
U47.	Mengfan (Ellen) Li (DMS, UR, now CMU master)	Spring 2024
U46.	Kyle Jhong (CS, DMS, UR)	Spring 2024-Spring 2025
U45.	Edwin Gao (CS, UR)	Summer 2024-Fall 2024

U44.	Toyin Harris (CS, Thurgood Marshall College Fund intern, North Carolina A&T)	Summer 2023
U43.	Madeleine Mann (BCS, ASL, UR)	Summer 2023-present
U42.	Ashley Bao (CS, REU intern, Amherst College)	Summer 2023
U41.	Kaleb Newman (CS, REU intern, Brown University,)	Summer 2023
U40.	Seana Marie Lanias (CS, Art, University of Rochester)	Spring 2023-Fall 2023
U49.	Samuel Frank (CS, UR)	Spring 2023-Fall 2023
U38.	Kayla Gunderson (ASL, BCS, UR)	Spring 2023
U37.	Xiangfei Zhang (CS, University of Rochester)	Spring 2023-fall 2023
U36.	Amber Lai (CS, University of Rochester)	Fall 2022-Spring 2023
U35.	Jingyan Yu (Data Science, Statistic, University of Rochester)	Fall 2022-Spring 2024
U34.	Haochen Zeng (Schwartz Discover Grant, CS, University of Rochester)	Summer 2022-Fall 2022
U33.	Jinghao Jiang (CS, Financial Economics, University of Rochester)	Summer 2022
U32.	Jiayi He (Louise) (CS, Digital Media Studies, University of Rochester)	Summer 2022
U31.	Zijian Meng (CS, University of Rochester)	Summer 2022
U30.	Pinxin Liu (Andy) (CS, Applied Math, University of Rochester)	Summer 2022
U29.	Yao Liu (CS, University of Rochester)	Summer 2022
U28.	Merritt Cahoon (REU, CS, Samford University)	Summer 2022
U27.	Samantha Ryan (REU, CS, Simmons University)	Summer 2022
U26.	Annie Qiu (CS, University of Rochester)	Summer 2022-Fall 2023
U25.	Muchen Zhong (CS, (minor) Econoimcs/Digital Media Studies, University of Rochester)	Spring 2022-Fall 2023
U24.	Yiwei Li (Data Science, University of Rochester)	Fall 2021
U23.	Peirong Hao (CS, University of Rochester)	Spring - Summer 2021
U22.	Xiurong Yu (Inclusive Computing Scholarship, CS, University of Rochester)	Spring 2021
U21.	Xiaojun Min (Inclusive Computing Scholarship, CS, University of Rochester)	Spring 2021
U20.	Minghui Zheng (Inclusive Computing Scholarship, CS, University of Rochester)	Spring 2021
U19.	Fiona Au (Inclusive Computing Scholarship, CS and Digital Media Study, University of Rochester)	Spring 2021 – Spring 2023
U18.	Daniel Munoz (Inclusive Computing Scholarship, CS, University of Rochester)	Spring 2021
U17.	Ziyue Qiu (CS, University of Rochester)	Summer 2020 - Fall 2021
U16.	Kaixin Li (Digital Media Studies, Brain & Cognitive Sciences, University of Rochester)	Fall 2020 – Spring 2021
U15.	Abdul Moid Munawar (UR Research and Innovation Grant, CS, University of Rochester, joined MSc at Simon Fraser University)	Summer 2020 – Spring 2022
U14.	Hecong Wang (CS, University of Rochester)	Spring 2020 – present
U13.	Phuong Vu (CS, University of Rochester)	Spring 2020-Fall 2020
U12.	Saad Ahmad (CS, University of Rochester)	Spring 2020 - Spring 2021
U11.	Adira Blumenthal (CS, University of Rochester)	Summer 2020
U10.	Victor Antony (CS, University of Rochester, now PhD student at John Hopkins)	Summer 2020 – Fall 2020
U9.	Sufian Mushtaq (CS, University of Rochester)	Spring 2020 - Fall 2020
U8.	Wanyi Hu (UR discovery grant, CS and Cell & Developmental Biology, University of Rochester)	Summer 2019 - Fall 2020
U7.	Sydney Dlhoposky (CS, University of Rochester)	Fall 2019 – Spring 2020

U6.	Lester (Sizhe) Li (CS, University of Rochester)	Fall 2019
U5.	Yoona Oh (REU, CS, Rice University)	Summer 2019
U4.	Chase K. Mortensen (REU, CS, Utah State University)	Summer 2019
U3.	Ashely Tenesaca (CS, University of Rochester, now PhD student at University of Maryland)	Spring 2019 – Spring 2021
U2.	Zhaoxiong Ding (CS, University of Rochester)	Spring 2019
U1.	Meiwen Zhou (CS, University of Rochester)	Spring 2019

Student Supervision prior to University of Rochester

Research assistant mentor (Carnegie Mellon University) (26 undergrad, 4 master and 1 PhD students) - augmented tabletop and hand gesture (2 students), embodied conversational agent (9 students), observational study (2 students), game reasoner (2 student) and human behavior transcription and annotation (16 students). — Spring 2016 – Summer 2018

Public Media

- WXXI News Connections with Evan Dawson Interview (Jan 2025). How locally developed AI tools are helping parents of Deaf children learn ASL. https://www.wxxinews.org/show/connections/2025-01-24/how-locally-developed-ai-tools-are-helping-parents-of-deaf-children-learn-asl.
- University of Rochester, News Center (Nov 2024). "Zhen Bai: Using AI to advance child development and learning". https://www.rochester.edu/newscenter/ai-deaf-and-hard-of-hearing-children-development-learning-627882/.
- News10NBC (July 2024). "High school students learn the power and ethics of AI at University of Rochester summer camp". https://www.whec.com/top-news/high-school-students-learn-the-power-and-ethics-of-ai-at-university-of-rochester-summer-camp/.
- University of Rochester News Center. "Lab experience your first year in college? Yes." Feb 2023 https://www.rochester.edu/newscenter/human-computer-interaction-lab-research-mentorship-549662/
- Interviewed on the Peggy Smedley Show on AR/VR technology for people with special needs. Feb 2022. https://peggysmedleyshow.com/ar-improving-lives.
- IEEE Institute: "Augmented Reality Can Help Children with Autism Tap into Their Imaginations". 2015. http://theinstitute.ieee.org/technology-focus/technology-topic/augmented-reality-can-help-children-with-autism-tap-into-their-imaginations.
- University of Cambridge: "The land of make-believe". Nov 2013. https://www.enterprise.cam.ac.uk/news/the-land-of-make-believe/.