

Hongming (Chip) Li

Ph.D. Candidate in Educational Technology | AI Evaluation, Human-AI Interaction, and Research Systems
hli3 [at] ufl.edu | Gainesville, FL, USA
hichiqli.com | github.com/hichiqli

RESEARCH SUMMARY

Ph.D. candidate in Educational Technology working at the intersection of **AI evaluation, human-AI interaction, learning analytics, and applied AI systems**. I study how LLMs and agentic AI systems behave in real human workflows, especially learning, collaboration, assessment, and design, and develop the **evaluation loops, instrumentation, and deployment-ready research infrastructure** needed to move these systems from prototypes to measurable, accountable, and improvable systems. Technically, my work spans Python/TypeScript AI applications, context engineering, structured generation, tool-calling and graph-based agent workflows, model routing, telemetry, safety/vetting pipelines, calibration, and trace-based model-behavior analysis. My primary application domain is education, but the transferable problem is broader: translating complex human activity into observable workflows, reliable AI behavior, applied AI workflow integration, and evidence-driven system redesign. I also maintain an active machine learning practice on Kaggle, where I hold Competitions Master status (global Top 1%) with multiple top-ranked finishes.

EDUCATION

University of Florida Ph.D., Educational Technology Advisor: Dr. Anthony Botelho	Aug 2023 – Present Gainesville, FL, USA
Johns Hopkins University Master of Science, Learning Sciences and Technologies Advisor: Dr. Richard Weisenhoff	Aug 2022 – Aug 2023 Baltimore, MD, USA
University of Southampton Master of Science (with Merit), Education Advisor: Dr. John Woollard	Sep 2021 – Sep 2022 Southampton, UK
Capital Normal University Bachelor of Education, Elementary Education and Linguistics Advisor: Dr. Fengxia Zhang	Sep 2016 – Jun 2020 Beijing, China

RESEARCH INTERESTS

- **Understanding Learning & Human Interaction:** Learning Analytics, Educational Data Mining, Multimodal Data Analysis, Causal Inference, Computer-Supported Collaborative Learning, Dialogue Modeling, Behavior Analysis
- **Designing & Evaluating AI Systems:** LLM/Agent Systems, Human-AI Interaction, AI Evaluation, Calibration, Context Engineering, Tool Use, Agent Skills, Model Routing, Research Infrastructure
- **Governing Responsible AI in Education and Beyond:** AI Safety, Trustworthy AI, Fairness, Explainability, Safety/Vetting Workflows, Human-in-the-Loop Review, AI Literacy, Educational Data Privacy

FUNDING, FELLOWSHIPS AND OTHER RESEARCH AWARDS

Best Student Paper Award International Society of the Learning Sciences Annual Meeting (ISLS 2026)	Jun 2026
Innovation in Design Award National AI Literacy Day	Mar 2026
Emerging Learning Technology Award Association for Educational Communications and Technology (AECT) DELT	Oct 2025
Best Paper Nominee The 26th International Conference on Artificial Intelligence in Education (AIED 2025)	Jul 2025
Innovation and Responsibility in AI-Supported Education (iRAISE) Travel Scholarship The 39th Annual AAAI Conference on Artificial Intelligence (AAAI 2025)	Mar 2025
School of Teaching and Learning Travel Award University of Florida	Oct 2024
Doctoral Consortium Graduate Student Travel Support recipient The 17th International Conference on Educational Data Mining (EDM 2024)	Jul 2024
OpenAI, InterLearn: Advancing Fair, Inclusive, and Adaptive Educational Technologies Principal Investigator: Dr. Anthony Botelho Co-PI: Hongming (Chip) Li	Apr 2024 - Apr 2025 (Award # 0000001997, \$5,000)
• Investigating the use of large language models (LLMs) in the educational context to address challenges of fairness and representativeness, focusing on developing explainable AI (XAI) for personalized student feedback.	

- Aiming to enhance AI-based feedback systems by analyzing differences between human-written and AI-generated content and creating a taxonomy of effective feedback types.
- Creating AI tools that offer safe, reliable, and educationally sound feedback, fostering improved learning outcomes for students.

PUBLICATIONS

* Corresponding author † Those authors contributed equally

Conference Proceedings (Peer-Reviewed Conference)

- Li, H.*, Kuang, H., & Botelho, A. F.* (2026, June). Can We Trust AI's Self-Assessment? Evaluating and Improving LLM Confidence Calibration in Educational Dialogue Coding. In *Proceedings of the 27th International Conference on Artificial Intelligence in Education (AIED 2026)*, Seoul, South Korea. (**Acceptance Rate: 16.7%**)
https://doi.org/10.1007/978-3-032-29755-6_18
- Li, H.*, Esmailigoujar, S., Adhami, N., Li, H., & Huang, R.* (2026, June). 'I Spend All My Energy Preparing': Balancing AI Automation and Agency for Self-Regulated Learning in SmartFlash. In *Proceedings of the International Conference of the Learning Sciences (ICLS) at the International Society of the Learning Sciences Annual Meeting (ISLS 2026)*, Irvine, CA, USA.
- Rahimi, S.*, Li, H., Esmailigoujar, S., & Ercan, D. (2026, June). Rubric-Guided Generative AI for Scalable Creativity Assessment in Educational Games. In *Proceedings of the International Conference of the Learning Sciences (ICLS) at the International Society of the Learning Sciences Annual Meeting (ISLS 2026)*, Irvine, CA, USA.
- Zhang, S.*, Li, H.*, Lee, S.*, Lee, J.-E., Schroeder, N. L., & Botelho, A. F.* (2026, June). Assessing Student Collaboration with Multimodal Data and Large Language Models. In *Proceedings of the International Conference of Computer-Supported Collaborative Learning (CSCL) at the International Society of the Learning Sciences Annual Meeting (ISLS 2026)*, Irvine, CA, USA.
- Zhang, S.*, Zambrano, A. F.*, Li, H.*, Lee, S.*, Lee, J.-E., & Botelho, A. F.* (2026, June). Modeling and Analyzing Collaborative Dialogue States in Mathematics Problem-Solving through ONA and Hidden Markov Models. In *Proceedings of the International Conference of Computer-Supported Collaborative Learning (CSCL) at the International Society of the Learning Sciences Annual Meeting (ISLS 2026)*, Irvine, CA, USA.
- Lee, S.*, Zhang, S., Li, H., Lee, J.-E., Closser, A., & Botelho, A. F.* (2026, June). Flexibility Before Fluency: Exploring Flexible Strategies Emerge through Collaborative Problem-Solving. In *Proceedings of the International Conference of Computer-Supported Collaborative Learning (CSCL) at the International Society of the Learning Sciences Annual Meeting (ISLS 2026)*, Irvine, CA, USA. **Best Student Paper Award**.
- Lee, S.*, Li, H.*, Zhang, S., Zhong, Z., Lee, J. E., & Botelho, A. F.* (2025, July). So What? Unpacking the Complexities in Collaborative Problem Solving with AI-Augmented Sense-Making. In *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, Palermo, Italy. (**Acceptance Rate: <16%**)
https://doi.org/10.1007/978-3-031-98462-4_54
- Zhang, S.*, Li, H.*, Lee, S.*, Schroeder, N. L.*, & Botelho, A. F.* (2025, July). VETTING AI for Deeper Learning: Constraining LLMs to Encourage Student Inquiry. In *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, Palermo, Italy.
- Rahimi, S.*, Ercan, D., Gao, R., Esmailigoujar, S., Babaee, M., Li, H., Zhang, S., Lee, S., Closser, A., & Botelho, A. F. (2025, July). ProductiveMath: A Generative-AI-Powered App to Support Productive Failure Teaching. In *Proceedings of the 26th International Conference on Artificial Intelligence in Education (AIED 2025)*, Palermo, Italy. **Best Paper Nominee (Late Breaking Results)**.
- Li, H.*, Xing, W., Lyu, B., Zhu, W., Liu, Z., & Li, H.. (2025, July). An Automated Aesthetic Assessment Framework of Mathematical Story Images Validated by Click Counts. In *Proceedings of the 12th ACM Learning @ Scale Conference (L@S 2025)*, Palermo, Italy. <https://doi.org/10.1145/3698205.3733923>
- Hwang, W., Li, H., Aguinalde, A. P., Zhang, Y., Shin, J.*, Crippen, K., & Carroll, B. (2025, July). Building an Explainable Recommender System for Engineering Students' Work-Integrated Learning (WIL). In *Proceedings of the 18th International Conference on Educational Data Mining (EDM 2025)*, Palermo, Italy. <https://doi.org/10.5281/zenodo.15870223>
- Li, H.*, & Botelho, A. F.* (2025, June). Balancing the imbalance: Enhancing MOOC discussion forum urgency prediction with LLM-generated data augmentation. In *Proceedings of the Computer-Supported Collaborative Learning (CSCL) at the International Society of the Learning Sciences Annual Meeting (ISLS 2025)*, Helsinki, Finland.
<https://doi.org/10.22318/cscl2025.111336>
- Li, H.*, Fang, Y., Zhang, S., Lee, S., Wang, Y., Trexler, M., & Botelho, A. F.* (2025, March). ARCHED: A human-centered framework for transparent, responsible, and collaborative AI-assisted instructional design. In *Proceedings of the iRAISE 2025: Innovation and Responsibility for AI-Supported Education at the 39th AAAI Annual Conference on Artificial Intelligence (AAAI 2025) (Spotlight Paper)*, Philadelphia, PA, USA. **Awarded the iRAISE Travel Scholarship**.
<https://doi.org/10.48550/arXiv.2503.08931>
- Li, H.*, Zhang, S.*, Lee, S.*, Lee, J.E.*, Zhong, Z.*, Weitnauer, E.*, & Botelho, A. F.* (2024, July). Math in motion: Analyzing real-time student collaboration in computer-supported learning environments. In *Proceedings of the 17th International Conference on Educational Data Mining (EDM 2024)*, 533–541, Atlanta, GA, USA.
<https://doi.org/10.5281/zenodo.12729878>
- Li, H.*, Lee, S.*, & Botelho, A. F.* (2024, July). This paper was written with the help of ChatGPT: Exploring the consequences of AI-driven academic writing on scholarly practices. In *Proceedings of the 17th International Conference on Educational Data Mining (EDM 2024)*, 542–550, Atlanta, GA, USA.
<https://doi.org/10.5281/zenodo.12729880>

- Zhang, S.*, Li, H.*, **Li, H.***, Botelho, A. F.*, & Israel, M.* (2024, July). Investigating the dynamic change of pre- and in-service teachers' experiences, attitudes, and perceptions through CS autobiography using topic modeling. In *Proceedings of the 17th International Conference on Educational Data Mining (EDM 2024)*, 921–926, Atlanta, GA, USA. <https://doi.org/10.5281/zenodo.12729999>
- **Li, H.***, & Botelho, A. F.* (2024, July). Developing explainable AI systems to support feedback for students. In *Proceedings of the 17th International Conference on Educational Data Mining (EDM 2024)*, 998–1002, Atlanta, GA, USA. <https://doi.org/10.5281/zenodo.12730029>
- **Li, H.***, & Botelho, A. F.* (2024, June). Fine-tuning large language models for data augmentation to detect at-risk students in online learning communities. In *Proceedings of the 17th International Conference on Computer-Supported Collaborative Learning (ISLS 2024)* (pp. 441–442). International Society of the Learning Sciences, Buffalo, NY, USA. <https://doi.org/10.22318/csl2024.208036>
- **Li, H.*†**, & Zhao, H†. (2022, June). Applying an online learning platform to enhance students' online education classroom learning experience during COVID-19. In *Proceedings of the 2022 8th International Conference on Humanities and Social Science Research (ICHSSR 2022)* (pp. 2837–2842), Chongqing, China. Atlantis Press. <https://doi.org/10.2991/assehr.k.220504.515>

Conference Presentations (Peer-Reviewed but Non-Archival)

- **Li, H.***, Zhang, S., Lee, S. M., Trexler, M., & Botelho, A. F.* (2026, November). Don't Write It For Me: LLM-as-a-Judge as an Emerging Paradigm for AI-Scaffolded Skill Development. In *the Association for Educational Communications and Technology (AECT) International Convention 2026*, Chicago, IL, USA.
- **Li, H.***, Lee, S. M., Zhang, S., & Botelho, A. F.* (2026, November). You Choose, the LLM Narrates: A Three-Layer Architecture for Narrative-Driven Decision Learning. In *the Association for Educational Communications and Technology (AECT) International Convention 2026*, Chicago, IL, USA.
- Huang, R.*, Bouwmeester, M., **Li, H.**, Wang, G., & Orfanos, M. (2026, November). Project-Based Learning for AI Education: A Scoping Review of Conceptualizations, Pedagogical Approaches, and Research Gaps. In *the Association for Educational Communications and Technology (AECT) International Convention 2026*, Chicago, IL, USA.
- Bouwmeester, M.*, Huang, R., Wang, G., **Li, H.**, & Orfanos, M. (2026, November). Bridging AI and Project-Based Learning: A Scoping Review of AI-Assisted PjBL Trends, Gaps, and Directions. In *the Association for Educational Communications and Technology (AECT) International Convention 2026*, Chicago, IL, USA.
- Rahimi, S.*, Esmaeiligoujar, S.*, **Li, H.*** (2026, April). Creativity assessment and machine creativity using generative AI in a sandbox physics game. In *the American Educational Research Association (AERA) Annual Meeting 2026*, Los Angeles, CA, USA.
- Lee, S.*, Zhang, S., **Li, H.**, & Botelho, A. F.* (2026, April). Designing for procedural flexibility with collaborative digital whiteboards: A case study of middle school algebra. In *the American Educational Research Association (AERA) Annual Meeting 2026*, Los Angeles, CA, USA.
- **Li, H.***, Lee, S.*, Zhang, S.*, & Botelho, A. F.* (2025, October). When AI agents battle: Can their debates transform learning and spark critical thinking? In *the Association for Educational Communications and Technology (AECT) International Convention 2025*, Las Vegas, NV, USA.
- **Li, H.***, Zhang, S.*, Lee, S.*, Trexler, M.*, & Botelho, A. F.* (2025, October). LOGEN AI: Implementing a transparent human-AI collaborative tool for enhanced instructional design. In *the Association for Educational Communications and Technology (AECT) International Convention 2025*, Las Vegas, NV, USA.
- Zhang, S.*, **Li, H.***, Lee, S.*, Schroeder, N. L.*, & Botelho, A. F.* (2025, October). Investigating student interactions with general and filtered ChatGPT. In *the Association for Educational Communications and Technology (AECT) International Convention 2025*, Las Vegas, NV, USA.
- Hwang, W.*, **Li, H.***, & Shin, J.* (2025, October). Co-Designing an Explainable AI Educational Recommender System: A Student-Centered Approach. In *the Association for Educational Communications and Technology (AECT) International Convention 2025*, Las Vegas, NV, USA.
- Lee, S.*, **Li, H.***, Zhang, S., Zhong, Z., Lee, J. E., & Botelho, A. F.* (2025, July). So What Now? AI-Augmented Sense-Making in Action: An Interactive Dashboard for Collaborative Mathematics Learning. In *the 26th International Conference on Artificial Intelligence in Education (AIED 2025) Interactive Events Track*, Palermo, Italy.
- Rahimi, S.*, Esmaeiligoujar, S.*, Gao, R.*, Celik, D.*, **Li, H.***, & Botelho, A. F.* (2025, April). Supporting teachers to prepare for productive failure using an AI-powered algebra problem generator. In *the American Educational Research Association (AERA) Annual Meeting 2025*, Denver, CO, USA.
- Rahimi, S.*, Celik, D.*, Gao, R.*, Esmaeiligoujar, S.*, **Li, H.***, & Botelho, A. F.* (2025, April). Using generative AI for automated human-creativity assessment and machine creativity in a sandbox game. In *the American Educational Research Association (AERA) Annual Meeting 2025*, Denver, CO, USA.
- Rahimi, S.*, **Li, H.***, Celik, D.*, Esmaeiligoujar, S.*, Gao, R.*, & Botelho, A. F.* (2025, March). An Automated Human-Creativity Assessment and Machine Creativity in a Sandbox Game Using Generative AI. In *the Society for Psychology of Aesthetics, Creativity, and the Arts Annual Conference (APA Division 10)*, New Haven, CT, USA.
- **Li, H.***, Zhang, S.*, Lee, S.*, & Botelho, A. F.* (2024, October). AI-enabled chatbots in educational practice: A systematic review from 2017 to 2023. In *the Association for Educational Communications and Technology (AECT) International Convention 2024*, Kansas City, MO, USA.

Journal Articles

- **Li, H.***, Zhang, S., & Botelho, A. F. (2026). VETTING: A dual-LLM framework for in-loop safety verification via policy isolation in educational AI. *Computers and Education: Artificial Intelligence*, 100646. <https://doi.org/10.1016/j.caeai.2026.100646>

- Rahimi, S.*, Li, H., Esmailigoujar, S., Ercan, D., & Botelho, A. F. (2026). A rubric-guided multimodal approach using high-capacity LLMs provides psychometrically sound creativity assessment in learning games. *Creativity Research Journal*. <https://doi.org/10.1080/10400419.2026.2638384>
- Lee, S.*, Baral, S., Li, H., Cheng, L., Zhang, S., Thorp, C. S., St. John, J., Thompson, T., Heffernan, N., & Botelho, A. F.* (2025). Developing a feedback taxonomy for math: A synergy of perspectives through data mining methods. *Journal of Educational Data Mining*, 17(2), 1-23. <https://doi.org/10.5281/zenodo.16684563>

Invited Talks

- Li, H. , Zhang, S.(2025, August). *ARCHED: A Human-Centered Framework for Transparent, Responsible, and Collaborative AI-Assisted Instructional Design*. Invited guest lecture for the Graduate User Modeling course (Topic: Chain-of-Thought prompting in AI-assisted design) at Worcester Polytechnic Institute (WPI), Worcester, MA. Host: Dr. Neil Heffernan.

Dissertations and Theses

Master's Thesis, Education, University of Southampton

- Li, H. (2023). Post-pandemic reflections: A literature review of the digital divide in online learning in the pandemic. Advisor: Dr. John Woollard. <https://doi.org/10.35542/osf.io/qug4h>

RESEARCH AND GRANT PROJECTS

CHECKPOINT: AI-Supported Formative Assessment and Learning Engineering Platform Jul 2025 – Present
(Learning Engineering Tools Competition Catalyst Prize) Principal Investigator: Dr. Anthony Botelho
Research Assistant, Lead Developer, & Human-AI Researcher | Formative Assessment, Learning Engineering, LLM Systems, TypeScript/Nuxt

- **Architected and implemented** a deployable research platform for AI-supported formative assessment, integrating authoring, runtime, analytics, telemetry, and support workflows into an evaluable human-AI system.
- Designed structured LLM generation and regeneration workflows for misconception-focused assessment using context assembly, prompt/version control, schema-aware outputs, validation constraints, and human review to make AI-assisted authoring more controllable and inspectable.
- Implemented modular teacher-facing, student-facing, and analytics components across **5 iterative release cycles**, balancing research instrumentation with deployment-ready usability and classroom-facing workflows.
- Operationalized research questions through structured item generation, targeted regeneration, analytics views, usage traces, generation metadata, and telemetry for future classroom evaluation and data-to-redesign loops.
- Implemented secure AI-serving and data-capture foundations, including authentication-aware access, payload validation, safe rendering, usage tracking, and analyzable logs of AI-supported assessment interactions.

ARCHED / LOGEN AI: Transparent AI-Assisted Instructional Design and Human-AI Collaboration Oct 2024 – Present
University of Florida
Research Assistant, Lead Developer, & UX Researcher | Human-Centered AI, Instructional Design, Responsible AI, Vue/Node

- Developed **ARCHED (AI for Responsible, Collaborative, Human-centered Education Instructional Design)**, a framework for transparent, responsible, and collaborative AI-assisted instructional design that argues against fully automated instructional-material generation.
- Framed AI-assisted design as a structured **multi-stage human-AI workflow** in which educators remain primary decision-makers while AI supports objective formulation, pedagogical option generation, and alignment evaluation.
- Instantiated the framework through a working prototype (LOGEN AI) that enables educators to generate, critique, and revise measurable learning objectives through editable intermediate outputs grounded in Bloom's Taxonomy.
- Implemented the full-stack prototype and instrumentation layer with Vue/Node, AI orchestration, prompt/context management, authenticated sessions, interaction logging, and data structures for analyzing educator-AI interaction patterns.
- Used iterative design research, usability feedback, and interaction traces to study how users accept, reject, and revise AI-generated suggestions, linking interface decisions to claims about agency, transparency, and responsible AI support.
- Disseminated this work as an **iRAISE / AAAI 2025 Spotlight Paper** and through an **AECT 2025 presentation on LOGEN AI**; ARCHED has also been cited and discussed in scholarly and practitioner-facing AI instructional-design contexts.

VETTING: Educational AI Safety, Assistant Validation, and LLM Evaluation Aug 2024 – Present
University of Florida
Research Assistant, Full-Stack Developer, & UX Designer | AI Safety, LLM Evaluation, Human-AI Interaction, Node/Firebase

- Co-developed **VETTING**, an educational AI safety and assistant-validation framework for studying when AI guidance supports productive inquiry versus over-automation or premature answer-giving.
- Operationalized **dual-LLM verification**, policy-isolated checks, answer-key awareness, modular assistant conditions, and filtered/unfiltered comparisons as evaluable mechanisms for AI behavior analysis.
- Built a modular Node/Firebase validation environment for controlled deployment of conversational AI assistants, including authenticated sessions, configurable assistant conditions, policy prompts, answer keys, interaction capture, and comparison of AI behaviors.

- Instrumented conversational traces, verification outcomes, and interaction metadata for empirical analysis, safety evaluation, model-behavior debugging, and evidence-driven refinement of assistant policies.
- Connected the framework to a **peer-reviewed AIED 2025 paper** on constraining LLMs to encourage student inquiry and an under-review journal manuscript on **dual-LLM, policy-isolated safety verification** for educational AI.

ProductiveMath / PRODUCTIVE: Generative AI Support for Productive Failure Teaching May 2024 – Dec 2025
(Bill and Melinda Gates Foundation Award # 080555) Principal Investigator: Dr. Seyedahmad (Ahmad) Rahimi
Research Assistant, Full-Stack Developer, & UX Designer | Generative AI, Teacher Support, Mathematics Education, React/Firebase

- Contributed to **ProductiveMath**, a generative-AI-supported teacher tool for preparing mathematics activities grounded in productive failure pedagogy.
- Designed structured LLM workflows for generating mathematically meaningful scenarios, including story context, problem complexity, prior-knowledge activation, pedagogical constraints, and revision pathways.
- Built full-stack teacher-facing components with React/Firebase for authenticated generation, editing, storage, sharing, and reuse of productive-failure mathematics scenarios.
- Connected system design to research on teacher preparation, generative AI, productive struggle, and creativity/assessment in mathematics learning environments.
- Contributed to the ProductiveMath project and related **AIED 2025 Late-Breaking Results paper**, which was recognized as a **Best Paper Nominee in the AIED 2025 Late-Breaking Results Track**.

NSF EAGER / GraspableMath: Multimodal Learning Analytics for Productive Collaboration Sep 2023 – Present
(NSF Award # 2331379) Principal Investigator: Dr. Anthony Botelho
Research Assistant, Full-Stack Developer | CSCL, Multimodal Learning Analytics, Collaboration Modeling, Python/R, Vue/D3

- Investigated how students develop collaborative mathematical problem-solving strategies through **multimodal learning analytics**, connecting event logs, dialogue, strategy use, participation, and collaboration states.
- Built preprocessing and feature-engineering pipelines for multimodal interaction data, transforming raw JSON event/dialogue traces into analyzable time-series, sequence, and collaboration-state features.
- Modeled collaborative processes using clustering, hidden Markov models, dialogue/state modeling, epistemic-network-style representations, and interpretable sequence analysis.
- Developed **GraspableMath collaborative learning analytics dashboards** with Vue/D3 and REST-style data flows as methodological infrastructure, linking event-level traces to interpretable indicators of strategy use, participation, and group problem-solving.
- Used dashboard-mediated interviews, usability inquiry, and analytic outputs to study how AI-augmented sense-making can help researchers and educators interpret collaborative problem-solving processes.
- Contributed analyses and system artifacts to research outputs including the peer-reviewed **AIED 2025 paper** on AI-augmented sense-making and an **ISLS 2026 Best Student Paper Award** paper on flexible strategy emergence in collaborative problem solving.

Instructional Design and Engagement Analytics (IDEA) Oct 2022 – Aug 2023
Instructional Resource Center, Johns Hopkins University Mentor: Dr. Wenting Weng
Research Assistant | Learning Analytics, Data Reporting, Course Design

- Analyzed learning-platform data from Panopto and Canvas to help instructors understand engagement patterns in digital and hybrid learning environments.
- Produced analytics reports and visual summaries that translated platform traces into evidence-informed instructional recommendations.
- Conducted quantitative analyses, including clustering and descriptive modeling, to identify patterns in learner engagement and course participation.
- Created professional learning materials to help instructors use educational technologies and learning analytics responsibly in course planning.

Integrating Technology into Teaching and Learning Oct 2021 – Dec 2021
Teachers College, Columbia University Supervisor: Dr. Irina Lyublinskaya
Research Trainee | Educational Technology, Instructional Design, TPACK

- Analyzed technology integration through TPACK and related instructional-design frameworks, focusing on how digital tools reshape teaching practice and learning opportunities.
- Designed a final project on online educational technology use, connecting learning theory, instructional strategy, and implementation constraints.
- Built an early foundation for later work on human-centered educational AI, learning analytics, and deployable research systems.

RESEARCH SOFTWARE AND AI INFRASTRUCTURE

VIALE Lab AI API & Agent Infrastructure Platform Feb 2025 – Present
Lead AI Infrastructure Engineer & Research Platform Architect | LLM Systems, Agent Orchestration, API Design, Observability, TypeScript/Hono, SQL, Edge/Serverless

- **Architected and led development** of a provider-agnostic, OpenAI-compatible research AI infrastructure platform that makes AI-supported interactions programmable, observable, and evaluable across chat, multimodal reasoning, safety/vetting workflows, embeddings, image generation, speech, transcription, and published agent runs.
- Developed a **graph-based agent orchestration runtime** that turns visual/code-authored workflows into stable API endpoints, supporting LLM, branch, loop, transform, image-generation, HTTP-tool, input, and output nodes with structured outputs and state passing.
- Implemented agent reliability and governance mechanisms, including execution budgets, scoped API-key execution, model allowlists, conversation continuity, per-node traces, and per-provider-call billing/logging.
- Built a provider-aware routing and model registry layer that normalizes requests, streaming responses, parameter support, modality constraints, aliases, and cost accounting across heterogeneous AI backends, supporting backend substitution without changing the public API contract.
- Designed a **research-grade telemetry pipeline** with data-plane logs, operational logs, request IDs, project/API-key attribution, token/cost/latency fields, CSV/JSONL exports, and credential/binary-payload redaction or summarization.
- Maintained public/internal API boundaries through **public/internal OpenAPI specifications (14 public operations vs. 65 internal operations)**, supporting external use without exposing developer, admin, billing, or provider internals.
- Built the companion developer portal for model discovery, API Playground, visual agent editing, metered test chat, scoped API-key management, usage/credit monitoring, log inspection/export, project sharing, audit review, and admin workflows.
- Maintained release discipline through **16 SQL schema migrations**, generated OpenAPI synchronization, deployment/WAF documentation, and a passing **87-test** API suite covering routing, multimodal handling, agent execution, access control, logging, and documentation boundaries.

VIABLE Lab Research Website

Sep 2024 – Present

Full-Stack Developer & UX Designer | Research Communication, Vue.js, Vite, GitHub Actions

- Rebuilt the lab's public website as a maintainable research communication platform for projects, publications, people, news, awards, and resources.
- Designed reusable information architecture, content models, and interface patterns that make scholarly outputs easier to update, browse, and communicate to students, collaborators, funders, and prospective partners.
- Implemented automated deployment workflows and static-site build practices to reduce maintenance overhead and keep public-facing research communication current.
- Improved accessibility, responsive design, and information architecture so the site functions as both a recruitment surface and a durable archive of research products.

TEACHING, INSTRUCTIONAL DESIGN, AND ACADEMIC SUPPORT

University of Florida

Gainesville, FL, USA

Teaching Assistant, IDS 2935: Making Sense – Understanding the World with Data and AI

Aug 2023 – Dec 2023

- Supported instruction for an interdisciplinary data and AI literacy course, helping students interpret NLP, machine learning, and data-analysis concepts.
- Evaluated lab assignments and provided feedback on students' use of AI, data reasoning, NLP models, and machine-learning workflows.
- Facilitated discussions on responsible AI use, data interpretation, and technical concepts for students from diverse disciplinary backgrounds.

Carey Business School, Johns Hopkins University

Baltimore, MD, USA

Graduate Assistant

Oct 2022 – Aug 2023

- Collaborated with instructional designers and technologists to develop universally designed course materials across multiple academic terms.
- Supported accessibility improvements and technology-mediated learning experiences for students with diverse learning needs.
- Provided ongoing course technology support and helped maintain consistent instructional quality across digital learning environments.

Johns Hopkins University Advanced Academic Programs

Baltimore, MD, USA

Instructional Designer Assistant

Oct 2022 – May 2023

- Conducted data-informed instructional design work using Canvas and Panopto analytics to help instructors interpret student engagement patterns.
- Authored data-use guidelines and professional learning materials for faculty interested in educational technology and analytics-informed course improvement.
- Designed professional development resources, storyboards, and workshops to support evidence-informed teaching and learning practices.

Pingxiang University

Jiangxi, China

Research Assistant and Teaching Assistant

Oct 2020 – Apr 2021

- Supported instruction for College English II and Introduction to Intelligent Education, including grading, feedback, and student learning support.

- Assisted faculty with lesson planning, multimedia integration, and classroom facilitation to improve student engagement.
- Contributed to early research and teaching activities on AI in education, technology-supported instruction, and higher education practice.

MENTORSHIP

Undergraduate Senior Projects

Bar-Nur, E. B., Qiu, S., Said, O. J., Steinbrecher, R., & Voigt, C. G. (Fall 2025). *Learning Nutrition: AI-Powered Full-Stack Educational Assessment Platform*. University of Florida CIS/CEN 4914 Senior Project. (Guided data acquisition, database design, API development, and front-end/back-end integration.)

Mosley, K. S., Ramirez, A., & Vazquez, M. (Spring 2025). *SmartGator: AI-Integrated Google Colab Extension*. University of Florida CIS/CEN 4914 Senior Project. (Supervised the development of a Chrome extension that integrates AI agents for intelligent workflow assistance and contextual feedback.)

PROFESSIONAL SERVICE

Leadership and Organizational Service

- **Web Chair**, *International Conference on Educational Data Mining (EDM) 2026 Organizing Committee* Jun 2026
- **Co-Director**, *UF College of Education 2026 Research Symposium Committee* Apr 2026
- **Session Host**, *International Society of the Learning Sciences Annual Meeting (ISLS 2025)* Jun 2025
- **Technology Chair**, *UF College of Education 2025 Research Symposium Committee* Mar 2025
- **Student Volunteer**, *International Society of the Learning Sciences Annual Meeting (ISLS 2024)* Jun 2024
- **Technology Chair**, *UF College of Education 2024 Research Symposium Committee* Mar 2024
- **Programme Representative**, *University of Southampton* Sep 2021 - Jul 2022
- **Vice President**, *Capital Normal University Student Union* Sep 2016 - May 2020

Conference Reviewer

- Association for Educational Communications & Technology International Convention (AECT) 2024, 2025, 2026
- American Educational Research Association Annual Meeting (AERA) 2025, 2026
- International Conference on Artificial Intelligence in Education (AIED) 2025, 2026
- International Conference on Educational Data Mining (EDM) 2026
- International Society of the Learning Sciences (ISLS) 2024, 2025, 2026
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) AI for Education Day 2026
- Annual Conference on Neural Information Processing Systems (NeurIPS) Position Paper Track 2025, 2026
- Technical Symposium on Computer Science Education (SIGCSE TS) 2026
- Annual Meeting of the Association for Computational Linguistics (ACL) Student Research Workshop (SRW) 2025
- AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES) Student Program 2025
- International Conference on Artificial Intelligence and Statistics (AISTATS) 2025
- International Conference on Learning Representations (ICLR) Workshop on AI4CHL 2025
- Learning Analytics and Knowledge Conference (LAK) 2024, 2025
- British Educational Research Association Annual Conference (BERA) 2024

Journal Reviewer

- Cognitive Computation
- Discover Computing
- Discover Education
- BMC Psychology
- Australian Journal of Psychology
- Discover Artificial Intelligence
- Scientific Reports
- Journal of Learning Analytics (JLA)

PROFESSIONAL MEMBERSHIPS

Association for the Advancement of Artificial Intelligence (AAAI) Jan 2025 - Present

Association for Computing Machinery (ACM) Jun 2024 - Present

International Society of the Learning Sciences (ISLS) Apr 2024 - Present

American Educational Research Association (AERA) Jan 2024 - Present

Association for Educational Communications and Technology (AECT) Aug 2023 - Present

British Educational Research Association (BERA) Jul 2022 - Present

National Education Union (NEU) Jul 2022 - Jul 2023

OTHER AWARDS AND RECOGNITIONS

Best Impact Award <i>University of Southampton 2022 Academic Awards</i>	May 2022
Outstanding Academic Scholarship <i>Capital Normal University</i>	Oct 2019
Special Scholarship for Social Engagement <i>Capital Normal University</i>	Oct 2019
Pioneer Leadership Award for Outstanding Undergraduate <i>Beijing Municipal Education Commission</i>	May 2019
Distinguished Student Leader Award <i>College of Elementary Education, Capital Normal University</i>	May 2019
Distinguished Student Leader Award <i>Capital Normal University</i>	May 2018
Silver Performance Award <i>Beijing College Student Drama Festival</i>	Nov 2017

SELECTED DATA SCIENCE COMPETITIONS

Kaggle Competitions Master	Global Ranking: 1,156 / 205,271 (Top 1%)
• Gold Medal, Home Credit – Credit Risk Model Stability Achieved 17th place out of 3,858 teams (Top 1%) by building stable credit-risk models with feature engineering, group k-fold validation, LightGBM, and CatBoost. • Silver Medal, LLM Prompt Recovery Achieved 97th place out of 2,175 teams (Top 5%); generated 14,000 synthetic samples using multiple LLMs and fine-tuned Mistral 7B with LoRA for prompt-recovery modeling. • Silver Medal, HMS – Harmful Brain Activity Classification Achieved 86th place out of 2,767 teams (Top 4%) by developing EEG/spectrogram classification models with ResNet/EfficientNet architectures and patient-level group k-fold validation.	Feb 2024 – May 2024 Feb 2024 – Apr 2024 Jan 2024 – Apr 2024

SKILLS

- **Programming & Data Engineering:** Python, JavaScript/TypeScript, Dart/Flutter, SQL, R, HTML/CSS; Pandas, NumPy, SciPy, scikit-learn; data preprocessing, feature engineering, JSON/event-log pipelines, time-series and sequence data
- **AI Evaluation & Calibration:** LLM-as-a-Judge, rubric-based evaluation, confidence calibration, reliability/agreement analysis, error analysis, ablation studies, evaluation harness design, trace-based debugging, red-team/safety evaluation
- **Agentic AI & LLM Systems:** multi-agent orchestration, tool/function calling, graph-based workflows, agent skills/modular capability packaging, context engineering, RAG/context assembly, structured outputs (JSON Schema), state/memory management, Model Context Protocol (MCP), model routing, cost/latency-aware inference, multimodal LLM integration
- **AI Workflow Integration & Applied Deployment:** workflow discovery, technical scoping, human-in-the-loop process design, prototype-to-deployment iteration, stakeholder-facing demos, operational documentation, API integration, production handoff
- **Feedback-Loop & Research-Loop Engineering:** telemetry design, human-in-the-loop review, data-to-eval-to-redesign loops, prompt/version control, usage analytics, experiment instrumentation, continuous system improvement from empirical traces
- **Applied AI Safety, Governance & Privacy:** policy-isolated verification, safety/vetting pipelines, answer-key-aware safeguards, access control, audit logs, rate limiting, credential redaction, educational data privacy
- **Machine Learning & Statistical Modeling:** PyTorch, TensorFlow, Hugging Face, LoRA fine-tuning, embeddings, clustering, hidden Markov models, predictive modeling, causal inference, regression/statistical modeling
- **Learning Analytics & Human-AI Interaction Research:** multimodal learning analytics, educational data mining, CSCL, HCI/user research, co-design, usability testing, formative assessment, AI literacy
- **UX, Learning Design & Research Communication:** Figma, wireframing/prototyping, interaction design, information architecture, design systems, accessibility (WCAG), instructional design, storyboarding, Articulate 360, research communication
- **Full-Stack & Research Infrastructure:** Vue.js, Nuxt.js, React, Flutter, D3.js, Node.js (Hono, Express), FastAPI, Flask, PostgreSQL, MySQL, SQLite, Firestore, Redis, RESTful APIs, OpenAPI, webhooks, serverless functions
- **Cloud, Edge & Production Systems:** Cloudflare Workers, AI Gateway, D1, KV, R2; AWS (EC2, Lambda, API Gateway, S3, RDS, Bedrock); Google Cloud; Firebase; Supabase; CI/CD, Docker, GitHub Actions, observability/logging, API security
- **AI-Assisted Development Tools:** Cursor, Claude Code, GitHub Copilot, OpenAI Codex, Gemini CLI, Cline
- **Languages:** Mandarin Chinese (native), English (fluent)