Jackson Song

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EDUCATION

University of Illinois Urbana-Champaign August 2023 – May 2026

BS in Information Sciences + Data Science, Minor in Computer Science GPA: 3.96/4.00

Academic Interests: Human–AI Interaction, AI for Health & Training, Digital Wellbeing

Research Experience

Evaluating Proactive vs. Reactive Facilitation in Mixed-Reality Medical Training May 2025 – Present

Research Assistant | Carle Illinois College of Medicine | *Advisor: Prof. Caroline Cao* Champaign, IL

- Designed a Vision Pro training platform using GPT-4 and Pinecone-powered RAG to deliver near real-time AI guidance across 8 lumbar puncture steps from patient preparation to cerebrospinal fluid draw
- Built a voice-interactive conversation system with Flask, OpenAI TTS, and AWS API Gateway to trigger AI guidance based on user hesitation, task errors, or inactivity, supporting 100+ concurrent sessions
- Deployed a scalable backend architecture with MongoDB, Redis (300ms latency), and AWS Systems Manager, integrating CI/CD pipelines and CloudWatch monitoring to reduce deployment time by 60%

Designing Toward Digital Self-Awareness and Wellbeing March 2025 – Present

Research Assistant | OnCARE Lab | *Advisor: Prof. Koustuv Saha* Champaign, IL

- Engineered a data collection pipeline to quantify prediction–behavior gaps in smartphone usage by logging app launches, unlock events, and session durations through time-locked, adaptive instrumentation
- Developed a full-stack platform using React, Node.js, and MongoDB for real-time prediction logging, dynamic usage visualization, and large-scale daily data capture across a two-week field study (N=24)
- Modeling with SMAPE, paired t-tests, and linear mixed-effects models (R) on estimated–actual smartphone usage gaps, identifying significant effects ($p<.05$) on satisfaction, self-control, and perceived stress

Enhancing Transparency in Biomedical Trial Reporting January 2025 – Present

Research Assistant | ScienceNLP Lab | *Advisor: Prof. Halil Kilicoglu* Champaign, IL

- Developed a sentence-level multi-label classification system using PubMedBERT to detect compliance with CONSORT and SPIRIT reporting standards in randomized controlled trial (RCT) documents
- Processed 10,000+ sentences annotated with 50+ guideline labels and fine-tuned PubMedBERT models in PyTorch and HuggingFace, achieving micro F1 around 0.88 on high-overlap reporting categories
- Designed an evaluation framework with label frequency analysis, macro/micro F1 scoring, and misclassification heatmaps to identify performance bottlenecks in methodological classification

Evaluating AI and Human Simulations in Law Enforcement Training May 2025 – August 2025

Research Assistant | Jump Simulation Center | *Advisor: Prof. Caroline Cao* Champaign, IL

- Created an adaptive persona simulation system using GPT-4o and Gemini Flash 2.5 to generate role-specific responses for law enforcement training across emotional regulation and de-escalation
- Implemented a multi-agent pipeline using Next.js, Python, and SQL to support context-aware prompt control, input parsing, session state management, and real-time web delivery with dynamic role switching
- Ran repeated-measures ANOVA with tidyverse preprocessing in R to examine prompt-timing conditions and identified significant differences ($p<.01$) in trust, flow, and engagement

EmSim: AI-Driven VR Training for Law Enforcement De-Escalation October 2024 – May 2025

Research Assistant | Illinois Police Training Institute | *Advisor: Prof. Mike Yao* Champaign, IL

- Crafted a browser-based dashboard with React.js and MongoDB to visualize simulation data including user choices, AI-triggered emotion events, and timestamped actions across 10+ branching scenarios
- Built a logging pipeline in Unity and Node.js to capture multi-modal user inputs such as speech, gestures, scene transitions, syncing with backend for session replay and post-hoc behavioral analysis
- Integrated Whisper-transcribed dialogue and GPT-4 classification outputs into interactive summary charts, enabling data-driven debriefing and instructor feedback sessions

INDUSTRY EXPERIENCE

Lvkang Medical Care May 2024 – August 2024
Software Engineer Intern Hangzhou, China

- Orchestrated a full-stack React.js and Node.js system for real-time incident reporting and internal communication across nursing home facilities, reducing unresolved event cases by 40% within 3 months
- Launched an event-driven alert pipeline using AWS Lambda and DynamoDB to detect, classify, and prioritize high-urgency alerts from resident monitoring endpoints in real time
- Architected a performance dashboard with D3.js and MongoDB to visualize over 1,200 resident–caregiver interactions, identifying workflow inefficiencies and improving response time analytics by 35%

MOONBOOW December 2023 – January 2024
Software Engineer Intern Shanghai, China

- Assembled a gesture-based mixed reality system for Meta Quest 3 using Unity (XR Toolkit) and C# to enable real-time 3D interaction and cross-platform deployment across spatial computing environments
- Configured a full-stack infrastructure using the MERN stack, WebSockets, and dynamic MongoDB schemas to support real-time state synchronization, behavior control, and session logging
- Integrated GPT-3.5 Turbo and Whisper APIs for low-latency voice interaction and maintained stability under simulated 5,000 QPS multi-user concurrency tests through load-balanced backend services

PUBLICATIONS

EmSim: An AI-Driven VR Simulation for Scenario-Based De-Escalation Training in Law Enforcement
Duo Wang, Kyrian Liang, **Wenxuan Song**, Zyra Sheikh, Jen Whiting, Victor Lu, Mike Yao, Caroline Cao
In Proceedings of the IEEE Conference on Artificial Intelligence and Extended and Virtual Reality (AIxVR 26).

SPATIALTUTOR : Object-Aware Mixed Reality Training for Procedural Medical Skills Training with AI-Driven Support
Duo Wang, Jianwei Ni, Yuhan Zhou, Weiyu Ding, **Wenxuan Song**, Shandra Jamison, Mike Yao, Caroline Cao
In Proceedings of the IEEE Conference on Artificial Intelligence and Extended and Virtual Reality (AIxVR 26).

"In my defense, only three hours on Instagram": Designing Toward Digital Self-Awareness and Wellbeing
Karthik S. Bhat, Jiayue Melissa Shi*, **Wenxuan Song***, Dong Whi Yoo, Koustuv Saha
In Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI '26 In Revision).

Should the AI Speak First? Evaluating Proactive vs. Reactive Facilitation in Mixed-Reality Medical Training
Duo Wang, **Wenxuan Song**, Jianwei Ni, Qingxiao Zheng, Yuhan Zhou, Kyrian Liang, Mike Yao, Caroline Cao
In Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI '26 In Revision).

Does Sequencing Matter? Evaluating AI and Human Simulations for High-Stakes Communication Training in Law Enforcement
Duo Wang*, Kyrian Liang*, Qingxiao Zheng, **Wenxuan Song**, Jen Whiting, Mike Yao, Caroline Cao
In Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI '26 In Revision).

Designing KRIYA: An AI Companion for Wellbeing Self-Reflection
Wenxuan Song*, Shane Zhu*, Jiayue Melissa Shi, Koustuv Saha
In Proceedings of ACM SIGCHI Conference on Designing Interactive Systems (DIS '26 In Preparation).

TEACHING EXPERIENCE

CS 124: Introduction to Computer Science (Java/Kotlin) August 2024 – December 2024
Course Assistant Tutor | UIUC | *Supervisor: Geoffrey Challen* Champaign, IL

- Mentored 100+ undergraduates in data structures and object-oriented design through weekly discussions and one-on-one tutoring, helping students break down complex problems and improve debugging accuracy
- Supported 5 Machine Problems (MPs) by guiding students through recursive algorithm implementation, interactive Java UI design, and development of unit-tested data structures

TECHNICAL SKILLS

Programming Languages: Python, Java, JavaScript, TypeScript, C#, C++, Swift, SQL, HTML/CSS

AI/ML & Systems Tools: PyTorch, TensorFlow, scikit-learn, Pandas, NumPy, BERT, AWS, Docker, Git/GitHub