

Siyou Pei

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Software Engineer

Full-stack Development | Mobile Applications | Applied AI/ML | Mixed Reality

Recent ECE Ph.D. graduate with strong software engineering fundamentals and hands-on experience building full-stack systems, mobile applications, applied AI/ML solutions, and Mixed Reality. Passionate about developing consumer-facing products that impact millions of users. Self-motivated, collaborative quick learner.

Skills

Languages: Python, C#, SQL, JavaScript/TypeScript, C/C++, Go

Tools: PyTorch, OpenCV, LLM, RL, Node.js, Unity, Git, Docker, AWS, CI/CD, React, Next.js, HTML, CSS

Education

Ph.D. in Electrical and Computer Engineering University of California, Los Angeles | GPA 3.88 | 2019-2025

B. Eng. in Electrical and Computer Engineering (Honors) Zhejiang University | GPA 3.92 | 2015-2019

Work Experience

Software Engineering Intern | Google | Sep. - Dec. 2022, Jan. - Apr. 2023 | San Francisco

Building multi-modal model for gaze- and gesture-based control of virtual objects in Mixed Reality

- Optimized performance from 5fps to 30fps (**6x improvement**) on a standalone XR device through proximity-aware gesture recognition activation
- Reduced memory usage by **60+%** (from 16GB to 6GB) through LOD (Level of Detail) implementation for 3D texture and mesh rendering in Unity
- Transitioned research to product impact by sharing findings **cross-functionally** and to XR community (**26K** views on [X](#)), providing actionable insights on AI-enhanced interactions with XR devices

Software Engineering Intern | JPMorgan Chase | Jun. - Sep. 2024 | New York City

Building networked Mixed Reality systems that support multi-user collaboration from distributed devices

- Built **distributed architecture** that interconnects AR headsets, motion trackers, input devices, and public displays with TCP/IP via Colyseus over AWS EC2 using JavaScript/TypeScript, Node.js and C#
- Achieved **real-time** performance with less than **50ms latency** (vs. 70-80ms multiplayer gaming standard) through (1) event dictionary encoding to minimize network traffic, (2) threaded communication for reliable delivery, and (3) selective layer rendering to reduce memory usage
- Successfully **deployed** beta production system across teams for real estate and crisis response, through collaboration with 9 business stakeholders, improving their collaborative workflows

Research Experience

Research Assistant | UCLA | Sep. 2019 - Jun. 2025 | Los Angeles | [Publication Record](#) | [Portfolio](#)

Developing AI-enhanced HW/SW solutions for Mixed Reality interaction

- Led system design and implementation across **7** research projects combining **AI/ML, XR/sensing and user studies**, mentoring **12** students and published **7** papers in top-tier peer-reviewed venues
- Architected an end-to-end **robot arm teleoperation system** where the operator is able to control robots with natural body movement in 6DoF. The system allows users to effectively adjust hand-gripper correspondence, freeze/resume teleoperation, and mirror their motion by intuitive mid-air manipulation in **Augmented Reality**
- Developed **real-time computer vision** algorithms via **PyTorch** and **OpenCV** to enable vision-based force detection. Achieved **120fps** on a **mobile** device with less than **0.3N** error (**patented**, *Best Demo Award*)
- Built **Hand Interfaces**, a gesture recognition system for AR/VR interactions using **C#/Python**, gaining community impact (**53K** views on [X](#)) and adoption in **Meta SDK** (*Best Paper Honorable Mention*)
- Architected **reusable** frameworks connecting backend **AI/ML algorithms** (including MobileNet, MediaPipe, LLM, RL) to **Unity** applications, **IoT** devices and **robot** arms, actively used by current lab members

Leadership & Teaching

Program Committee Associate Chair | CHI Late-Breaking Work 2024, 2025

Conference Reviewer | 2021 - 2024 | Reviewed 43 submissions for CS conferences

Leading Coordinator | 2023 | Non-Profit UCLA Summer Camp in STEM for local high school students

Teaching Assistant | 2021 - 2024 | Digital Signal Processing, Signals and Systems, Electronic Circuits