

# Jiatuo (Charlie) Zou

(954) - 471 -9533 | jz3331@columbia.edu |

<https://scholar.google.com/citations?user=0BX8YIUAAAAJ&hl=en&authuser=2>

## EDUCATION

**Columbia University**  
**Master of Science in Computer Science**  
GPA: 4.00.

New York, NY  
Sep 2024 - May 2026

**University of Illinois at Urbana-Champaign**  
**Bachelor of Science in Computer Science**  
GPA: 3.91 (Dean's List & Graduated with Highest Honors in Engineering).

Champaign, IL  
Aug 2021 - May 2024

## PUBLICATIONS

- B. Yang, X. He, C. Zou, J. -S. Liu, B. Tversky and S. Feiner, "Virtual Reality Task Guidance Through Relative 6DoF Pose Specification," 2025 IEEE International Symposium on Mixed and Augmented Reality Adjunct (ISMAR-Adjunct).
- Yang, B., He, X., Zou, C., Liu, J., Tversky, B., Feiner, S. Bimanual XR Specification of Relative and Absolute Assembly Hierarchies for Teleoperation. arXiv:2603.01495, 2026.

## RESEARCH EXPERIENCE

**Laboratory for Intelligent Imaging and Neural Computing**  
**Research Assistant**

Columbia University, NYC, NY (On-site)  
May 2025 - Present

**Project: OLIVE**

- Developed a **Unity VR** "Spaceshooter" game integrating real-time EEG + gaze for target identification assistance.
- Built **gRPC-based** streaming to transmit gaze points and EEG signals from Unity to backend for online inference and training.
- Designed and implemented a **CLIP-driven AI agent (OLIVE)** that learns player intent from **gaze-EEG** correlations, classifying targets into 2 categories -- friendlies or enemies -- using these neural feedbacks to provide dynamic visual cues.
- Conducted controlled user studies demonstrating rapid model convergence within ~80 seconds, achieving greater than 0.90 AUC in target classification and enabling personalized target suggestions in real time.

**Computer Graphics and User Interface Lab**  
**Research Assistant**

Columbia University, NYC, NY (On-site)  
Sep 2024 – Present

**Project: Delegate the Details**

- Constructed a **Unity VR** system for robotic teleoperation comparing absolute (direct manipulation) and relative (delegation-based) control modes for 6 DoF object placement and hierarchical manipulation in VR.
- Implemented bimanual interaction, object grouping, and part snapping assistance for complex 3D assembly tasks.
- Evaluated a user study (n=20), with relative mode reducing workload (NASA-TLX p=.003), achieving 85% user preference, and improving overall task efficiency by 32% through all difficulties.

**Project: Cascade Messaging Toolkit**

- Designed and implemented 3 example case scenarios (e.g., robot safety alerts, IoT monitoring, drone command tasks) to evaluate spatial and hierarchical messaging workflows in **Unity**.
- Compared Cascade vs. **Unity Events** by integrating Tobii eye tracking (120 Hz), timed coding tasks, and post-study surveys to evaluate correctness, workload, and usability across these 2 paradigms.
- Conducted and analyzed a within-subject study (n=14), showing Cascade improved task correctness (+0.34,  $p < .001$ ) and reduced cognitive load while maintaining practical usability.

**Lab of Brain-Computer Intelligence**  
**Research Assistant**

Hangzhou Dianzi University, China (On-site)  
May 2024 - Aug 2024

**Project: IDTS Healthcare "Pod"**

- Built a full-stack system for an **Intelligent Diagnosis & Telemedicine System (IDTS)** for public health measuring, consisting of 3 components: an onboard **React** web UI, a WeChat mini-program for profile tracking, and a **MySQL** backend.
- Enabled real-time acquisition of 5 health data structures (ECG, temperature, BP, SpO<sub>2</sub>, glucose) via **Bluetooth** Linktop SDK.
- Visualized multi-modal data using **Apache ECharts** (line charts, histograms) in mini-program.
- Led a team of 7 people on project and assigned tasks to everyone based on expertise; planned an 8-week milestone check for teammates and checked progress weekly during meetings, including a periodic 1-to-1 dev check helper session.

**Forward Data Lab**  
**Research Assistant**

UIUC, Champaign, Illinois (On-site)  
Aug 2023 – Dec 2023

**Project: LLM Context Augmentation**

- Built a **RAG-based LLM** pipeline using **LangChain + Chroma** vector store, embedding both document chunks (papers) and conversation history with OpenAI **text-embedding-ada-002**.
- Experimented with open-source models (e.g., **Llama-2-7b**) to test its summarization capability on self-designed questions.

- Deployed the pipeline onto the lab server and implemented metrics like **BLEU** to test the system against state-of-the-art private models like **ChatGPT-3**'s outputs as reference, achieving ~40 **BLEU** score.

## WORK EXPERIENCE

---

### COMS4731 Computer Vision I

Columbia University, NYC, NY (On-site)

#### Teaching Assistant

Sep 2025 - Dec 2025

- Supported the course by holding weekly office hours, grading biweekly homework, proctoring exams, and maintaining course materials, such as publishing homework and grades.

### PhinD

Champaign, Illinois (Hybrid)

#### Software Engineer Intern

Jan 2025 – May 2025

- Built a file management system with **AWS S3** integration, implementing real-time file preview functionality.
- Managed **PostgreSQL** database on **AWS RDS**, implementing CRUD operations via **SQLAlchemy ORM**.
- Developed efficient **RESTful API** endpoints with **FastAPI** to optimize frontend-backend communication.
- Implemented a job recommendation system using text embeddings and cosine similarity, with additional keyword filtering.

### CS361 Probability and Statistics

UIUC, Champaign, Illinois (On-site)

#### Course Assistant

Aug 2023 - May 2024

- Graded a total of 5 homework assignments, proctored midterm and final exams, and hosted regular office hours.
- Constructed and trained an encoder model in **PyTorch** to analyze and predict student grades based on past homework grades.

## RELATED PROJECTS

---

### Dungeon Builder/Crawler

Columbia University, NYC, NY (On-site)

#### Course Project

Jan 2025 - May 2025

- Built a **mobile AR** dungeon-builder app using **ARCore**, supporting 6DoF object placement (floors, doors, enemies, chests) with hierarchical placement constraints (objects to be placed on a floor).
- Designed an adaptive instruction UI that tracks task progress and updates completion status dynamically.
- Implemented undo/redo, delete, and **JSON**-based save/load features, enabling levels to be imported directly into a **Meta Quest VR** dungeon-crawler app for an immersive game experience.

### TrippinDark

UIUC, Champaign, Illinois (On-site)

#### Course Project

Jan 2023 - May 2023

- Implemented **AI** behavior for NPCs to support dynamic gameplay and player interaction in **Unreal Engine 5**.
- Designed and built two game levels using free assets, integrating sound effects and custom animations for immersive experience
- Developed core gameplay features including inventory systems, interactive objects (pick-ups, puzzles), and trap mechanisms, enhancing game complexity and engagement for users.

## AWARDS

---

- Awards: Winner of General Track at HackIllinois 2022, Web Development.

## SKILLS

---

**Languages:** Python, C++, C#, Java, JavaScript, TypeScript, SQL, HTML, CSS, Kotlin, Swift.

**Frameworks & Tools:** Unity, Git, CI/CD, PostgreSQL Database, React.js, Express.js, Node.js, Firebase, GCP, FastAPI, AWS.

**AI:** Machine Learning, Deep Learning, Computer Vision, RL, NLP, Transformers, LLM, TensorFlow, PyTorch, Claude, Codex.