Ray (Ruitao) Chen

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WORK EXPERIENCES

New York University | Future Reality Lab **New York City, NY**
Graduate Research Assistant (On-Site, with Prof. Kenneth Perlin) *January 2025 – Now*

- Developed a web-based **XR user interface and a 6-channel WebSocket communication layer** connecting to the ROS2 backend for multi-sensor control and navigation planning of a drone swarm (3-5), in collaboration with the Agile Robotics and Perception Lab (work **accepted for publication** at IEEE ICRA 2026).
- Prototyped and prompt engineered **(**Gemini Studio API) a **real-time AI chatbot** integrating into online meeting platform *Bici*, enabling users to use natural language to manipulate 3D scene animations from generated executable JSON control code.
- Designed interactive Web-based **VR lecture experiences for NYU Virtual Reality course** (CSCI-GA 3033), using customized 3D graphics framework to enable real-time, immersive interaction in both teaching & learning.

Spatial Front, Inc **Washington, D.C.**
Data Engineer Intern in Quality Assurance (Remote) *July 2023 – August 2023*

- Performed **front end API tests in the GIS** (Geographic Information System) developing environment using Postman and Swagger UI. Compiled **20+ test cases** and uploaded on Jira Platform to track display issues of the web-interface.
- Determined the performance of newly developed features in the company's database system utilizing K-means clustering via Azure Studio, with **10+ noisy data sets** being discovered.
- Participated in bi-weekly sprint cycles, contributing to feature design discussions, task scoping, peer code reviews, and release retrospectives within an Agile development environment.

7thOnline **New York City, NY**
Software Engineer Intern (On-Site) *June 2022 – August 2022*

- Assisted SaaS (Software as a Service) customer support team in adjusting functionalities of software programs “Wholesale, DTC, and 7thOnline” to satisfy the needs of client companies. Increased the workflow efficiency of clients by **15%**.
- **Optimized the Case-Based Reasoning algorithm** with Dr. Saman Hong to improve the performance of existing SaaS software, increased the prediction precision of wholesale planning by **10%**.
- Compiled **Java test cases** to examine data visualization of the company’s beta application “7thLite” on both PC and mobile platforms, wrote **20+ Bug Reports**, and uploaded them to the internal Red Hat bug reporting system to increase the stability.

EDUCATION

New York University **New York City, NY**
Master of Science (M.S.) in Computer Science **GPA:** 3.48 / 4.00 *January 2024 – May 2026*
The Ohio State University (Graduated with Magna Cum Laude latin honor) **Columbus, OH**
Bachelor of Science (B.S.) in Mathematics & Minor in Computer Science **GPA:** 3.67 / 4.00 *January 2020 – December 2023*
Related Courses: Math: Calculus, Linear Algebra, Discrete Math, Probability, Scientific Computing, Cognitive Modeling
Computer Science: Data Structures, Algorithm, Operating System, Database, Machine Learning, Virtual Reality, Computer Vision

PROJECTS

Multi-Agent Spatial Reasoning XR System *September 2025 – Now*

- Architected a **5-agent collaborative backend** (Parser, Asset, Scene, Verification, Execution) using LangGraph and FastAPI, translating natural language commands into precise 3D spatial manipulations with iterative refinement loops.
- Built a **full-stack WebXR interface** (Three.js, Meta Immersive Web SDK) with real-time WebSocket synchronization, enabling users to construct and manipulate XR scenes from scratch via natural language (work targeting IEEE VR 2027).

Augmented Reality Drone Control Simulator *January 2025 – May 2025*

- Designed **a full-stack AR drone teleoperation system**, combining spatial user interfaces and live hardware control.
- Built custom 3D interaction widgets using Three.js, with a Node.js backend enabling real-time synchronization across server and headset, multi-client state sharing, and low-latency command streaming to a physical drone.

Webcam-Based Gesture-Controlled Drone Interface *January 2024 – May 2024*

- Designed a **real-time computer vision pipeline** integrating hand landmark extraction (MediaPipe, OpenCV) with TensorFlow Lite classification (KeyPoint + LSTM-based Point History models) to enable gesture-driven navigation of a DJI Tello drone.

SKILLS

Programming Languages: Java, Python, C++, SQL, JavaScript, HTML.
Software: VS Code, Colab, Azure Studio, MySQL, Docker, Postman, Linux, ROS2.
Skills: End-to-End testing, Full-Stack Development, Distributed System, WebXR Prototyping, Agent Architecture Design.
Interest: Classical Vocal (4-year vocal training experience, won 2nd prize in Asian Teenage Singing Festival).