Jiabao Hu

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Education

- **University of Southern California (USC)** · Los Angeles, CA — Aug. 2023 – Dec. 2025
  Master of Science in Computer Science — *GPA: 3.85/4*
- **University of Illinois at Urbana-Champaign (UIUC)** · Urbana, IL — Sep. 2019 – Jun. 2023
  Bachelor of Science in Civil Engineering · with Honors · Minor in Computer Science — *GPA: 3.75/4.0*
- **Zhejiang University (ZJU)** · Hangzhou, China — Sep. 2019 – Jun. 2023
  Bachelor of Engineering in Civil Engineering — *GPA: 3.93/4.0*

Technical Skills

- **Programming Languages**: Python, C, C++, Java, JavaScript, TypeScript, HTML, CSS, Shell
- **Technologies**: Spring Boot, Nginx, Angular, React, Flask, Node.js, Express.js, Bootstrap, AWS, GCP, MongoDB, Android, OpenGL, WebGL, Socket Programming
- **Tools**: MySQL, Redis, PyTorch, Git, Jupyter, Docker, Linux, WSL, VirtualBox, LaTeX

Selected Projects

- **Full-Stack Web Weather App**: *Angular, Node.js, Express.js, MongoDB Atlas, AWS EC2, Tomorrow.io API*
  - Developed a responsive weather app with **Angular** and **Express.js**, supporting real-time forecasts with UI updates under **100ms**.
  - Designed scalable **RESTful APIs** to fetch live weather data from **Tomorrow.io**, sustaining **300ms average latency** under load.
  - Integrated **MongoDB Atlas** to persist up to **50+ favorite cities** per user across sessions with **zero data loss**.
  - Deployed on **AWS EC2** with Nginx reverse proxy, autoscaling to support **1000+ concurrent users** with 99.9% uptime.
- **Android Weather App**: *Java, Android SDK, Google Maps API, MongoDB Atlas, Tomorrow.io API*
  - Developed a mobile weather app in **Java** with **Android SDK**, featuring real-time weather updates, achieving smooth **60FPS** rendering across 3 interactive tabs.
  - Integrated **Tomorrow.io** and **Google Maps API** to support location-based forecasts and search autocomplete, enabling response times under **200ms**.
  - Built persistent cloud storage using **MongoDB Atlas**, supporting up to **50+** cities tracked across sessions with zero data loss in testing.
  - Designed a responsive tab layout with Highcharts visualizations, favorite city bookmarking, and 1-click Twitter sharing; user navigation latency kept below **100ms**.
- **Weenix - Unix-like Operating System**: *C, Weenix OS, Linux Kernel Development*
  - Implemented **kernel threads**, **VFS**, and **virtual memory** modules in C, totaling around **3K lines of code**.
  - Developed cooperative thread scheduling and context switching to support **10+ concurrent kernel threads**.
  - Built a basic **VFS** supporting open/read/write/close with file descriptors; verified via user-level test cases.
  - Enabled paging and address space isolation for **20+ user-space processes** in simulated multitasking.
- **Multi-Server Stock Trading System**: *C++, TCP/UDP Sockets, Linux, Socket Programming, Multi-processing*
  - Built a high-performance trading system with 4 distributed servers handling auth, quotes, and portfolios via **TCP/UDP**.
  - Enabled encrypted login, real-time trading, and synchronized portfolio tracking with struct-based messaging.
  - Processed **1000+** simulated trades with **>99%** success under dynamic port and network shifts.

Selected Research Experience

- **Research Assistant – Computer Vision · Software Engineering for Infrastructure AI** — Haining, China
  Zhejiang University/University of Illinois Urbana-Champaign Institute — *Sep. 2022 – Apr. 2023*
  - **Engineered a modular 3D simulation platform in Python/Blender**: Designed and implemented the "Random Bridge Generator," a procedural modeling tool that programmatically builds synthetic 3D bridge environments (6 bridge types) with randomized structural geometry and textures. GitHub Link Publication Link
  - **Built scalable data generation pipelines for CV model training**: Automated the generation of 10K+ photorealistic images with pixel-wise annotations using randomized UAV-style camera views and Cityscapes background overlays, enabling high-quality datasets for semantic segmentation.
  - **Integrated and trained deep learning pipelines (PyTorch)**: Trained DeepLabV3+ with ResNet-101 encoder on the synthetic dataset, achieving 85.9% IoU for column/pier detection and 79.8% for deck — enabling accurate structural component recognition.

Leadership & Working Experience

- **Teaching Assistant** — Hangzhou, China
  ZJU-UIUC Institute, Zhejiang University — *Sep. 2022 – Dec. 2022*
  - **MATH 221: Calculus I**: Led weekly discussion sessions for 30+ students; held office hours and developed learning materials.
- **Team Lead – Teaching & Learning Assistant (Unimate)** — Hangzhou, China
  Zhejiang University International Business School (ZIBS) — *Oct. 2021 – Jun. 2022*
  - : Led a cohort of 10+ assistants to support incoming international students. Coordinated onboarding and served as a liaison between faculty and students.