

# Charlton Shih

charltonshih645@g.ucla.edu • linkedin.com/in/charlton-shih • chewton2k.github.io/Portfolio/

## Education

### University of California Los Angeles

Sep 2023 – Jun 2027

Bachelors of Science in Computer Science

Relevant Coursework: Computer Organization, Discrete Math, DSA, Linear Algebra, OOP, OS, Software Construction

## Experience

### Machine Learning Researcher

Dec 2024 - Present

Physical Sciences and Mathematics Lab

Los Angeles, CA

- Collaborated with a 3-person team to formulate a **multi-click cascading bandit framework with asymmetric information**, extending applicability to search and recommendation domains
- Implemented **modified Python algorithms** (e.g., interval-elimination for reward asymmetry) and performed statistical analysis on simulation data, establishing **sublinear regret guarantees** with theoretical proofs
- Executed **100,000+ round simulations** demonstrating how slot-termination probabilities and feedback asymmetries reshape algorithmic performance

### Full Stack Developer

Dec 2024 - Aug 2025

AdOptimal

Los Angeles, CA

- Ad-Optimal connects businesses with student organizations, streamlining advertisement workflows and financial transactions
- Built and maintained **scalable RESTful API services** to support **real-time communication and payment processing**, integrating with React frontend and ensuring reliable **async client-server interactions**
- Engineered and optimized **indexed partial-search queries**, leveraging caching to cut query latency by **50%** and improve throughput under load
- Automated **data ingestion pipelines** via web scraping, and secured user authentication by implementing **OAuth 2.0 with JWT**, enforcing stateless access control across microservices

### Autonomous Robotics Researcher

Jul 2024 – Jul 2025

Physics & Astronomy Lab

Los Angeles, CA

- Collaborated with a **10-person team** to develop **autonomous surgical robots** with 3D visualization and 8 DOF
- Programmed in **C++ and Python**, writing data-transfer scripts to coordinate robotic arms and engineered a **low-latency servomotor system** with ROS2 + ESP32, reducing synchronization delays
- Improved **ultrasound image tracking accuracy by 60%** with OpenCV-based reconstruction, enabling more reliable navigation during surgery
- Applied **imitation learning models (ACT)** to enhance robotic learning from demonstrations beyond rule-based control

### Course Assistant (CS35L)

Mar 2025 - Jun 2025

University of California Los Angeles

Los Angeles, CA

- Led **20–30 student discussion** sessions on software construction, covering Emacs, networks, scripting, and software testing
- Collaborated with course professors and **conducted office hours** to assist students with coursework and projects

## Projects

### PillPall | Typescript, React.js, MongoDB, Express, Arduino, Websocket

Jan 2025 - Jun 2025

- Collaborated with a **16-person cross-disciplinary team** to build an automated pill dispenser that **tracks usage and sends real-time notifications**, improving medication adherence
- Engineered a **full-stack IoT platform** linking ESP32 microcontrollers, servo motors, and IR sensors with a React/MongoDB web app, integrating **Google Calendar API, OAuth 2.0, and Google Cloud IAM** for secure scheduling and reminders

### UCLA Design | Javascript, React.js, Node.js, MongoDB, Express, Git/Github

Jan 2025 - Apr 2025

- Architected a **MERN full-stack web platform** with RESTful API endpoints and optimized MongoDB indexing, enabling fast **CRUD operations, search, and dynamic filtering** of user-generated dorm layouts
- Built a **real-time drag-and-drop interface** in React, integrating backend persistence and state management to streamline layout creation and editing for **100+ interactive designs**

## Technical Skills

**Languages:** Python, C/C++, JavaScript/HTML/CSS, Swift, LaTeX, Shell, SQL

**Frameworks:** React, React Native, Next.js, Node.js, TensorFlow, Scikit-learn

**Tools:** Git/GitHub, Docker, Jupyter, ROS2, Selenium, MongoDB, Firebase, Supabase, Google Cloud (APIs, OAuth 2.0, IAM)