Charlton Shih

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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

Undergraduate Researcher — Dec 2024 - Present
Physical Sciences and Mathematics Lab — Los Angeles, CA

- Collaborated with a three-person team to design and develop multiplayer DCM cascading bandits under **reinforcement learning** frameworks, targeting **sublinear regret** under unique action and reward information asymmetry settings
- Experimented with **Thompson Sampling** and **UCB algorithms** to analyze multi-agent, multi-click bandit performance
- Conducted **large-scale simulations (100,000+ rounds)** to validate theoretical bounds, measuring regret growth under varying exploration strategies (mMDSEE, UCB Intervals, Round-Robin Allocation)

AdOptimal — Dec 2024 - Present
Full Stack Developer — Los Angeles, CA

- Ad-Optimal connects businesses with student organizations, simplifying processes for advertisements and transactions
- Built and maintained **RESTful API** endpoints to support **real-time communication and payment processing**, integrating with frontend components and ensuring reliable client-server interactions
- Developed and optimized partial-search functionality, improving search efficiency and **cutting load times by 50%**
- Utilized **web scraping** for data collection and implemented **OAuth 2.0 with JWT** for secure, stateless authorization

Undergraduate Researcher — Jul 2024 – Jul 2025
Physics & Astronomy Lab — Los Angeles, CA

- Collaborated with a 10-person team to develop autonomous surgery robots under Prof. Arisaka and Yunbo Wang
- Established efficient servomotor communication using **ROS2, ESP32, and Python**, improving synchronization latency
- Boosted **tracking efficiency by 60%** through **OpenCV** for ultrasound reconstruction accuracy and biopsy operations
- Developed and applied **imitation learning** techniques using **ACT, CNNs,** and motor output models based on the mobile Aloha

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, network security, scripting, operating systems, and software testing techniques
- Collaborated with course professors and **independently 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 team of mechanical, electrical, and UI/UX engineers** to build Pill Pall, an automated pill dispenser that tracks usage and notifies users of scheduled doses
- Developed a **full-stack IoT** system connecting **ESP32 microcontrollers, servo motors, and IR sensors** with a web platform to enable **real-time dispensing and confirmation tracking**
- Integrated **Google Calendar API, OAuth 2.0, and Google Cloud IAM** to manage medication schedules with secure reminders and event creation

UCLA Design | *Javascript, React.js, Node.js, MongoDB, Express, Git/Github* — Jan 2025 - Apr 2025

- Architected a **full-stack web application** with a scalable RESTful API to handle CRUD operations for **user-generated room layouts**, supporting efficient data storage and retrieval
- Developed a **real-time drag-and-drop UI** using React's component-based architecture for interactive room development
- Designed and optimized a **NoSQL database** in MongoDB, indexing user-generated layouts and **integrating queryable search functionality with dynamic filtering**

Technical Skills

Languages: Python, C/C++, Javascript/HTML/CSS, Swift, LaTeX
Frameworks: React, React Native, Next.js, Node.js, TensorFlow
Tools: Git/GitHub, Docker, Jupyter, ROS2, Selenium, MongoDB, Firebase, Supabase, Google Cloud (APIs, OAuth 2.0, IAM)