Charlton Shih

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Education

University of California, Los Angeles (UCLA) Expected June 2027
Bachelors of Science in Computer Science

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

Experience

Physical Sciences and Mathematics Lab | *Machine Learning Researcher* December 2024 – Present

- 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

AdOptimal | *Full Stack Developer* December 2024 – August 2025

- Architected a full-stack web application with **React.js, Node.js, and Express with a NoSQL database** (MongoDB) to connect businesses with student organizations to streamline advertisements.
- Developed server and client architecture, enhancing speed and accuracy of **data request and retrieval processes by 30%**; implemented HTTP server, developing **REST APIs and dynamic libraries** to simplify internal communication
- Engineered and optimized **indexed partial-search queries**, leveraging caching to cut query latency by up to **50%**
- Automated **data ingestion pipelines** via web scraping, and secured user authentication by implementing **OAuth 2.0 with JWT**, enforcing stateless access control across microservices.

Physics & Astronomy Lab | *Autonomous Robotics Researcher* July 2024 – July 2025

- 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, high-precision servomotor system** with ROS2 + ESP32, reducing synchronization delays by around **30%**
- Boosted **ultrasound tracking accuracy by 60%** through OpenCV-based image refinement for more reliable navigation
- Applied **imitation learning models (ACT)** to enhance robotic learning from demonstrations beyond rule-based control

University of California Los Angeles *Course Assistant (CS35L)* March 2025 – June 2025

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

Projects

PillPall | *Typescript, React.js, MongoDB, Express, Arduino, Websocket* January 2025 – June 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* January 2025 – April 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
- Optimized 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, 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)