# Charlton Shih

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## Education

**University of California, Los Angeles (UCLA)** — Los Angeles, CA
*Bachelor of Science in Computer Science* — *Expected June 2027*

**Relevant Coursework:** Software Construction, Data Structures & Algorithms, Networks, Object-Oriented Programming, Operating Systems, Computer Graphics, Digital Logic Design, Linear Algebra, Discrete Math, Differential Equations
**Teaching:** CS35L (Software Construction), MATH 32B (Multivariable Calculus)

## Technical Skills

**Languages & OS:** Python, C, C++, Java, TypeScript, JavaScript, HTML, CSS, Swift, Shell, SQL, Window, MacOS, Linux
**Frameworks:** React, React Native, Next.js, Node.js, PyTorch, Scikit-learn, Flask, Numpy, Pandas
**Tools:** Git/GitHub, Docker, PostgreSQL, OpenCV, Supabase, MongoDB, Selenium WebDriver, Google Cloud Platform (OAuth 2.0, IAM), Postman, Prisma, Jupyter, ROS2

## Experience

**Software Engineer** | *Clubhouse* — March 2025 – Present

- Designed and implemented a full-stack web application using **React, Next.js, Supabase, TailwindCSS**, and deployed on **Vercel**, enabling **200+ users** to access and explore information about UCLA student clubs to promote transparency
- Built and optimized database schemas and API integrations to sort over **1,000+** club entries across **40+** categories
- Worked alongside a 14-person cross-functional team to translate Hi-Fis into functional UI features using TailwindCSS

**LLM Epigenetics Researcher** | *Pellegrini Lab & Roychowdhury Lab* — September 2025 – Present

- Engineered sequence tokenization and embedding pipelines with **Python** and **PyTorch** to handle bisulfate conversions
- Evaluated LLM-derived genomic embeddings by comparing **447+** evolutionary distances with traditional sequence metrics

**Machine Learning Researcher** | *BruinML Lab* — December 2024 – October 2025

- Collaborated with a **3-person** team to formulate a multi-click cascading bandit framework for recommendation domains
- Implemented modified **Python algorithms** (e.g., interval-elimination for reward asymmetry) and performed empirical mean estimation and confidence-bound analysis, establishing **sublinear regret** guarantees with theoretical proofs
- Executed **100,000+ simulations**, demonstrating how termination probabilities and feedback reshape model performance

**Software Engineer** | *AdOptimal* — December 2024 – August 2025

- Designed a full-stack web app using **React.js**, **Node.js**, and **MongoDB** to connect businesses with student organizations
- Streamlined server and client architecture, enhancing speed and accuracy of **data request** and **retrieval processes** by **30%**; developed with **REST APIs** to enable efficient and maintainable internal communication between services
- Constructed and optimized indexed partial matching and leveraged debouncing to cut API calling by up to **50%**
- Automated **data ingestion pipelines** via web scraping, and secured user authentication utilizing **OAuth 2.0** and **JWT**

**Autonomous Robotics Researcher** | *Arisaka Elegant Mind Lab* — July 2024 – July 2025

- Coordinated 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 by around **30%** and improving motion precision
- Boosted ultrasound tracking accuracy by **60%** through **OpenCV** image and object refinement for more reliable navigation

## Projects

**CrowdPlan** | *Typescript, Next.js, PostgreSQL, Redis, Docker, Prisma, Git/Github* — September 2025 – Present

- Architected a full-stack event coordination platform using **Next.js, React, Node.js, Express, Prisma**, and **PostgreSQL**, containerized with **Docker** and Docker Compose for reproducible, scalable development and deployment
- Implemented core features allowing users to create, manage, and RSVP to created events, building a responsive frontend, a **RESTful** backend, a relational database managed via **Prisma** to ensure reliable data handling and seamless user interaction

**PillPal** | *Typescript, React.js, MongoDB, Express, Arduino, Websocket, Git/Github* — January 2025 – June 2025

- Directed a **16-person cross-disciplinary team** to build a full-stack IoT automated pill dispenser that tracks usage and sends real-time notifications using integrated **Google Calendar API, OAuth 2.0, and Google Cloud IAM**

**Stock Market Prediction (ML)** | *Python, scikit-learn, Numpy, Pandas, Jupyter* — Jun 2024 - Sep 2024

- Built data frames and visualizations with **Pandas, NumPy**, and **Jupyter** to compare predictions across **10000** data points
- Boosted **scikit-learn** model accuracy from **50%** to **58.8%** via backtesting on 10 years of data with new predictors