

Jake Li

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Education

Columbia University, B.S. Computer Science and Applied Mathematics Minor New York, NY
School of Engineering and Applied Sciences | J Suchato Scholarship Recipient | GPA: 4.00 May 2028

- **Relevant Coursework:** Machine Learning, Natural Language Processing, Robotics Algorithms and Kinematics, Advanced Programming, Probability Theory, Data Structures and Algorithms, Linear Algebra, Discrete Math, Analysis & Optimization, Ordinary Differential Equations, Multivariable Calculus, Data Analysis with Python
- **Teaching Assistant:** Fluid Mechanics, Probability Theory, Differential Equations, Intro to Electrical Engineering
- **Awards & Honors:** Eagle Scout, American Invitational Mathematics Exam Qualifier x3, AMC with Distinction (127.5/150), USA Biology Olympiad Semifinalist, Jack Kent Cooke Scholarship Semifinalist
- **Activities:** Columbia Org of Rising Entrepreneurs (Fellowship Recipient), Alpha Kappa Psi Business Fraternity

Skills

- **Languages:** Python, Java, C/C++, MATLAB, JavaScript, HTML, CSS
- **Data Analysis:** NumPy, SciPy, Pandas, Matplotlib
- **Backend & Tools:** Linux, asyncio, WebSockets, REST APIs, Node.js, PostgreSQL, Firebase, Supabase, Git, Pytest

Experience

Vehicle Software Automation Engineer Los Angeles, CA
Relativity Space May 2026 - Aug 2026

- Developed **CONOPS** and **operational procedures** for fluid-system test campaigns, then implemented them as **state machine**-driven **PID control loops** in **Python** and **NovaScript**, an in-house language
- Designed **hardware-in-the-loop (HIL)** test software linking **ground support equipment** to flight hardware, validating camera and valve behavior under simulated spaceflight conditions via mock telemetry from a proxy server
- Wrote **pytest** suites against edge-case telemetry from proxy hardware, simulating potential valve closure failure modes
- Diagnosed and fixed **NovaScript-C++** package version conflicts by testing API calls across releases

AI/ML Research Engineer San Francisco, CA
Costream (YC S25) Nov 2025 - Present

- Benchmarked open-source **speech foundation models** (Kyutai Moshi, Sesame CSM, NVIDIA PersonaPlex, Qwen3-Omni, Freeze-Omni) on **latency**, conversational quality, and licensing to select a commercially viable base model
- Built a public **human-preference arena** for TTS and speech-to-speech models: blind pairwise voting (10,000+ votes) across six native **audio-LLM** providers, with a **Bradley-Terry** leaderboard and bootstrap confidence intervals
- Validated 10,000+ **human preference votes** against a 9-model **LLM-as-judge** board scoring each battle in both orderings, using **Cohen's κ** , **Spearman ρ** , and flip rate to separate preference signal from noise and **position bias**
- Built the **preference data pipeline** for a speech **reward model**: a blind **consensus re-vote site** where four voters re-judge each battle, keeping only unanimous or 3-1 majority outcomes as verified **human-preference training data**

Software Engineer Intern New York, NY
Omen (YC F25) Feb 2025 - May 2025

- Engineered cross-platform UI/UX using **React Native** and **TypeScript** to implement **Figma** design prototypes
- Created web browser and mobile device application compatible with iOS interface using Expo Go (MVP launched in May)
- Integrated **Supabase** as the backend for full-stack functionality with real-time database syncing and user authentication
- Designed a web scraper that fetches **NLP-analyzed data** across major news outlets and social media platforms

Projects

Don't Get Distracted - Python, OpenCV, YOLO, Arduino, PWM Servo Columbia Hardware Hackathon Nov 2025

- Built a 3-servo robotic arm on an **embedded Arduino controller** that detects phone use via camera **object detection** and pokes the user when distracted
- **Fine-tuned a pretrained YOLO object detector** on a self-collected dataset of team members' faces and arm placements to distinguish "phone in hand" from "working"; used **OpenCV** for capture and inference to suppress false positives
- Wrote **embedded C++ firmware** driving three servos via **pulse width modulation**, with a **UART serial protocol** to a Python host and an on-device state machine with cooldown logic, so the arm executes a poke trajectory and returns to rest between interrupts

High-Altitude UAVs (Balsa Wood/Carbon Fiber Gliders)

- Prototyped flip-wing double boost system with **SolidWorks**, increasing thrust height by 20% and reducing drag by 15%
- Simulated flight conditions in Microsoft Flight Simulator and wind tunnels, modeled pre-flight trajectories in **MATLAB**
- Instrumented gliders with an **embedded microcontroller flight logger** (IMU + barometric altimeter) to record altitude and attitude, validating MATLAB trajectory models against flight data

Leadership & Involvement

Propulsion Fluids Member New York, NY
Columbia Space Initiative Rocketry Team Sep 2024 - Present

- Designed a **PID** for a brushless motor to dynamically adjust the flow rate of liquid oxygen into combustion chamber
- Coded a **Python** file that analyzed the nonlinearities of fluid flow, turbulence, and thermal contraction from liquid oxygen
- Soldered ESP32 microcontrollers and related circuit components for main electronic components of model rocket