Ethan Kong

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Education

Stanford University Palo Alto, CA
B.S. in Aeronautics & Astronautics ***GPA: 4.05*** *Sep 2025 – Jun 2028 (exp.)*

Experience

Undergraduate Researcher 2025 – Present
Stanford Plasma Physics Laboratory

- Built and iterated on a 20 W Electron Cyclotron Resonance (ECR) thruster test article; characterized plume behavior and current-closure sensitivity to magnetic nozzle and cathode-emitter settings under vacuum conditions.
- Developed thrust-stand calibration around a chain-payout force model and encoder-referenced electromagnet actuation loop, improving run-to-run repeatability and measurement confidence across tests.

Full Stack Software Engineer May 2025 – Aug 2025
D2 Place Mall, Hong Kong

- Engineered WhatsApp Business chatbot API (Flask + Meta Developer Platform + Qwen-AI) for FAQs, indoor navigation, and promotions; shipped production deployment and response routing.
- Built and operated daily scrapers across 40+ tenant sites to keep promotions/menus current; containerized jobs and deployed via GitHub Actions for automated refresh with production uptime monitoring.

Clubs

Aerodynamics Engineer Sep 2025 – Present
Stanford Solar Car Project | ***SolarCarLuminaryAutoCFD***

- Built an automated Luminary Cloud CFD + solar irradiance workflow that standardizes simulation runs and exports drag/irradiance tables to Google Sheets via Google Cloud APIs, enabling rapid comparison across designs.
- Modeled retractable twin-skin sail concept with active aerosurface control; simulated crosswind deployment scenarios to reduce propulsion power draw under gust variability.

Aerodynamics Lead and Systems Integration Engineer Sep 2025 – Present
Skyrunners (autonomous drone delivery team), Stanford Student Robotics

- Designed blended-fuselage fixed-wing E-VTOL and payload/vertiport integration system in CAD, reducing required wingspan by 30 cm; failure mode analysis and prevention to ensure safety and smooth operation during delivery.
- Ran CFD-driven iteration and stability prediction (static/dynamic) using physics-based models with lightweight inference; used results to place center of gravity, choose aileron size, and reduce integration rework.

Projects & Publications

Tempo – 4D Chrono-Spatial Memory System | *C++, C#, OpenGL, WebSocket, Three.js, OpenCV* TreeHacks 2026

- Built a distributed multi-sensor volumetric capture system that reconstructs spaces into navigable point clouds for desktop/web/AR; shortlisted for TreeHacks Grand Prize.
- Implemented a length-prefixed TCP binary stream for synchronized sensor frames; solved extrinsics with solvePnP + ICP refinement, rendered via OpenGL using quantized point packing, and streamed to Three.js clients over WebSocket to support replay and multi-user annotations.

Ion Thruster Optimization Through Simulations | *Wolfram Language, Mathematica* Sep 2024

- Simulated gridded-ion and Hall-effect thrusters and validated against UMich PEPL datasets; derived parameters improving thrust-to-power ratio by 53% compared to NASA's NEXT thruster and published peer-reviewed results.

Sailing Computational Fluid Dynamics + Reinforcement Learning | *Python, Mathematica* Jul 2023

- Created my own lattice-Boltzmann solver to compute lift/drag ratios over 12,000 wind, sail, and boat angles.
- Utilized CFD sweeps above as dataset to train deep reinforcement learning policy for time-optimal tacking under stochastic winds; integrated CFD-derived aerodynamics into the learning loop.

Technical Skills

Languages: Python, C++, C#, JavaScript, SQL, MATLAB, Mathematica/Wolfram Language, LaTeX
Frameworks/Infra: FastAPI, Flask, Next.js, React, Docker, SQLite (WAL), Railway, GitHub Actions
Aero/Robotics: Solidworks, Onshape, Fusion 360, Ansys, Luminary Cloud, ROS2, INAV, LoRa telemetry, 3-D printing
Systems/Vision: REST APIs, TCP/WebSocket, OpenGL (OpenTK), Three.js, OpenCV, point clouds, ICP