

Edward Ju

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EDUCATION

California Institute of Technology

Bachelor of Science in Computer Science, Minors in Aerospace Engineering and Robotics / 4.10 GPA / Expected June 2027

Coursework: Multidisciplinary Systems Engineering, Aerospace Control Systems (G), Space Engineering (G), Experimental Robotics (G), Advanced Topics in Machine Learning (G), Mobile Robots (G), Mechanical Prototyping, Practical Electronics for Space Applications (G), Experimental Robotics (G), Projects in Machine Learning (G)

Activities: Caltech PARSEC Rocketry, NASA Big Idea Challenge, Caltech Robotics Team, Caltech CAOS

Honors/Awards: NASA Big Idea Challenge Finalist, Palantir Launch Fellow, Jane Street FTTP, 2x AIME Qualifier

EXPERIENCE

Spacecraft Modeling Intern, NASA Jet Propulsion Laboratory (2026 Summer)

Autonomous Robotics and Control Lab, California Institute of Technology (2025.09–Present)

Undergraduate Researcher

- Developed a racing simulator and live dashboard for an autonomous Indy racecar, hooking into the game engine via Lua to extract telemetry, decoding camera streams, and bridging simulator data to ROS 2 vehicle control commands
- Built a pose estimation system using an Error-State Kalman Filter to fuse IMU and GPS data at 100 Hz for real-time vehicle state tracking and localization

Robotics Startup (2025.07–2026.01)

Robotics Engineer

- Designed a low-latency teleoperation system for the Unitree G1 that integrates HybrIK-based human pose estimation with custom inverse-kinematics solvers to retarget human motions onto the humanoid
- Developed a sim-to-real pipeline that trains control policies in MuJoCo and deploys them on the physical humanoid via ROS, using safety-oriented filtering

Advanced Mechanical Bipedal Experimental Robotics Lab, California Institute of Technology (2025.01–2025.09)

Research Fellowship

- Designed a Byzantine fault-tolerant multi-UAV coordination framework using Control Barrier Functions and semidefinite programming, implementing 5 solver variants (QP, SDP, DPP) controlling for up to 17 agents while guaranteeing collision avoidance and communication connectivity
- Implemented F-resilient connectivity constraints and deployed on Crazyflie 2.x hardware with OptiTrack

Palantir Technologies (2025.03–2025.03)

Palantir Launch Program Participant

- Selected as one of ~70 undergraduates nationwide for Palantir's highly selective Fellowship
- Built a full-stack stock alert platform on Palantir Foundry using AIP OSDK, React, and TypeScript; set up ontology data pipelines with Alpha Vantage API integration to process live S&P 500 market data, triggering real-time portfolio rebalancing alerts based on user-defined sector thresholds

NSF AI Institute for Edge Computing Leveraging Next Generation Networks (Duke Athena AI Institute) (2024.06–09)

NSF REU Researcher

- Developed a real-time mmWave radar processing and monitoring pipeline from raw 14/16-bit TI IWR ADC streams
- Developed a DBSCAN-based anomaly detection module over range-Doppler sequences to identify interference patterns and validate radar behavior in live vehicle monitoring scenarios

PROJECTS

National Geographic ISS Explorer Payload, Ground Station Operator

- Building the Ground Data System for a 4U NanoLab scientific payload launching to the International Space Station in partnership with National Geographic and NanoRacks; Dockerized the full ground station stack (InfluxDB + Grafana) with YAML-based auto-provisioning
- Designing a commanding interface for transmitting experiment scripts to the payload's Raspberry Pi 5 flight computer; Launching to ISS in March 2027

Near-Space High-Altitude Balloon Payload Development

- Launched a Kaymont-600 high altitude balloon to near-space (~24 km / 80,000 ft) with a ~3000 g integrated payload, tracking via APRS on 144.39 MHz and SPOT Trace satellite, and GoPro imaging
- Built a Raspberry Pi-based atmospheric sensing payload (BME280, ICM20948, INA219, GPS, CO2/O2) and ran flight trajectory predictions using SondeHub burst calculator for launch and recovery planning

CHARIOT (Cooperative Heterogeneous Autonomous Robots for Intra-Crater Operations and Transport) System Engineer, Adaptive Landing Gear Team Software Lead

- Worked on autonomy design and development of flying and hopping robot that could land in slanted slopes inside lunar crater. Integrated with LATTICE (modular, self-deploying infrastructure for transporting cargo)
- Developed computer vision-based elevation mapping and localization for optimal landing (ROS, Ubuntu, Jetson Nano, RealSense + Zed 2 Camera)

Neural Decoding ML Research

- Worked on a neural decoding project focused on analyzing brain activity to identify decodable features using intracranial EEG (sEEG) and single-neuron data; Extracted movie features using pre-trained neural networks and GPT-4 and applied various ML models (Logistic Regression, MLP, LSTM, and BiLSTM) to decode the relationship between neural activity and movie features

SKILLS

C++, Python, MATLAB, Simulink, ROS/ROS2, EKF/ESKF, Particle Filters, Control Barrier Functions, Linux, Jetson, mmWave Radar (TI IWR), Range-Doppler Processing, LiDAR, RealSense/Zed, OptiTrack