JASON TRAN

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EDUCATION & LEADERSHIP

California Institute of Technology, Pasadena, CA   *Sept 2023- June 2027*
B.S. Electrical Engineering
Minor: Environmental Science Engineering | ***GPA: 3.6***

Leadership: Peer Advocate Program; Academic Research Committee; Fraternity House Stewardship
Coursework: EE44 Circuit Analysis & Deterministic Systems; EE45 Fundamentals of electronic circuits and systems.; EE55 Mathematics of Electrical Engineering; EE/Ae157a Remote Sensing; EE111 Signal Processing; EE150 Deep Learning; ME133a Robotics: Kinematics

EXPERIENCE

NASA JPL – Cloud and Precipitation Airborne Radar Development   May 2025 – July 2025
Jet Propulsion Laboratory (JPL), Pasadena, CA

• Supported design upgrades to the multi-frequency CloudCube/APR-3 airborne radar system; participated in radar development reviews covering architecture changes and subsystem interfaces.

• Updated system and subsystem block diagrams to document revised RF, electrical, and optical signal paths; assisted with integration planning and system-level configuration.

• Collaborated with RF engineers on signal-chain upgrades involving mixers, LNAs, IF routing, and waveguide components; performed lab validation using signal and spectrum analyzers to verify gain, continuity, and signal quality.

• Designed CAD models for radar–optics alignment and custom mechanical interface plates to integrate the upgraded radar assembly into a new aircraft payload bay.

Green Labs Associate & Sustainability Research Intern   Sept 2025 – Present
Caltech Green Labs, Pasadena CA

• Conduct lab energy audits to identify power, equipment, and material inefficiencies; track energy and waste costs to help reduce operational expenses across campus laboratories to help labs adopt low-waste, energy-efficient workflows

• Lead personal waste-reduction research in Engineering & Applied Science & AI labs, analyzing waste streams in engineering environments and developing recommendations to minimize material and equipment waste.

• Operates Caltech's ReStore program, cataloging and organizing donated lab equipment to improve inventory tracking and expand equipment reuse.

Climate Modeling Research Intern   Oct 2025 – Present
Climate Modeling Alliance (MIT–Caltech–JPL), Pasadena, CA

• Contribute to the Climate Modeling Alliance (CliMA) through development and testing of open-source Julia models CloudMicrophysics.jl, KinematicDriver.jl used for simulating cloud microphysics and atmospheric convection.

• Maintain the KinematicDriver.jl codebase and explore single- and double-moment microphysics schemes to improve the accuracy and stability of climate simulations.

Solar Car Club – Electrical Engineering Team   Aug 2022 – Jan 2023
University of the Pacific, Stockton, CA

• Contributed to the design of electrical power and energy systems for a life-size solar car in the American Solar Challenge

• Assisted with integration of batteries, solar cells, and fuses; tested flexible/convex solar configurations with tracking sensors to enhance energy capture.

PROJECTS

Autonomous Robotics Project   Mar 2025 – Jun 2025
• Developed a fully autonomous mobile robot through a multithreaded Python framework, integrating IR line sensors, 3-axis ultrasonic array, gyroscope, and NFC reader with Raspberry Pi control and L298N motor drivers.

• Implemented advanced navigation behaviors including line-following with intersection detection, wall-following with continuous feedback control, obstacle avoidance using herding algorithms, and NFC-based object fetching with electromagnet manipulation

• Developed graph-based topological mapping system tracking intersection connectivity with dead-end detection, unknown territory exploration, and Dijkstra-based path planning with dynamic replanning when blockages were detected.

• Built a regression-based turning model using gyroscope feedback to accurately predict motor drive times for precise angle control across varying surfaces

Digital Piano Project   Mar 2025
• Designed and built an electronic piano using an Arduino Micro and MCP4725 DAC (I2C), driving a custom V2F converter.

• Implemented a 13-button input to generate A4–A5 with sharps/flats, converting discrete DAC voltages into stable audio-frequency outputs.

• Simulated analog circuitry in LTspice and used oscilloscopes and power supplies to measure, debug, and tune waveform generation.

• Designed and tested a low-pass audio filter (UA741 op-amp), applying analog circuit analysis to smooth noisy DAC output and improve signal quality

Humanoid Tennis Bot   Nov - Dec 2025
• Developed a ROS 2 humanoid tennis manipulation system using a hybrid inverse kinematics pipeline (Newton-Raphson for target solving, damped least-squares differential IK for real-time tracking) with a 100 Hz finite-state controller and quintic joint-space trajectories for smooth motion.

• Designed a reduced 5D task-space formulation to avoid kinematic singularities, enforced joint limits throughout the swing cycle, and integrated RViz visualization for real-time debugging and controller validation

TECHNICAL SKILLS

Python **|** Java | Julia | MATLAB | Arduino | ROS 2 | PyTorch | TensorFlow | Linux | Bash | NumPy | SciPy | Pandas | Matplotlib | Scikit-learn | OpenCV | Jupyter | Google Colab | Git | GitHub | LTspice | Altium Designer | Raspberry Pi Pico (MicroPython) | Serial | I2C & SPI | PCB design | soldering | wiring |Oscilloscopes | digital multimeters | power supplies | function generators |Basic radar/RF hardware (waveguides, LNAs, mixers) | IR sensors | motor drivers

US Citizen ◇ Available For Work