

# THOMAS TRAN

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## EDUCATION

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### University of Michigan College of Engineering

Bachelors of Science in Computer and Electrical Engineering

Ann Arbor, MI

Aug. 2023 - May. 2026

- **Selected Coursework:** Advanced Embedded Systems, Embedded Control Systems, Control Systems Design
- **Campus Involvement:** Michigan Aeronautical Science Association(MASA) Avionics Project Lead, VSA

## EXPERIENCE

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### Michigan Aeronautical Science Association (MASA)

Avionics Subteam Radio Lead

Ann Arbor, MI

Sept. 2024 - Present

- Leading a team of 3 students in pioneering a bare-metal C driver for the Semtech SX1280 transceiver, architecting firmware for radio configuration, packet handling, and data buffering to enable critical telemetry transmission
- Engineering thread-safe SPI communication routines with FreeRTOS critical sections, guaranteeing 100% data integrity for radio module during high-frequency operations
- Spearheading system validation by authoring diagnostic firmware to capture real-time RSSI/SNR, confirming an 11.5 dB link margin and securing a 10 Kbps data rate at an altitude of 75,000 feet
- Collaborating with Mechanical and Propulsion sub-teams to define data packet requirements and integrate avionics hardware, ensuring seamless system-wide communication for rocket launch operations

### University of Michigan - CAEN

Classroom Technology Maintenance Technician

Ann Arbor, MI

Aug. 2025 - Present

- Provide technical support for over 200 integrated AV systems across 70+ classrooms, resolving an average of 5+ support tickets weekly to maintain operational uptime
- Resolve complex system-level connectivity issues by analyzing signal paths and validating AV control hardware network
- Execute routine diagnostics across 70+ multimedia classrooms, improving system reliability by 25% and reducing failure

## PROJECTS

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### Autonomous Parafoil Guidance & Control System

- Engineered the flight computer's hardware architecture, authoring PCB schematics, defining the 4-layer stackup, and selecting LDOs for a star-routed power distribution network
- Directed high-speed layout strategy, implementing  $50\ \Omega$  impedance matching for the GPS antenna trace and establishing component placement to ensure signal integrity
- Developed the real-time data acquisition framework by integrating all peripherals (9-axis IMU, GPS) with an STM32 in a FreeRTOS environment, enabling future EKF and control loop implementation

### Multi-Modal Robotic Gantry Control System

- Engineered a real-time STM32 control system for a 2-axis gantry, integrating a vision system (SPI) and a custom wireless Wii remote (I2C/UART) processing raw 10-bit IR sensor data
- Authored interrupt-driven firmware to manage asynchronous data and hardware safety, achieving motor control step frequencies up to 3 kHz and failsafe operation via GPIO limit switch interrupts
- Implemented a GPIO handshake for SPI link, leveraging a logic analyzer to ensure 100% data integrity and enable reliable, high-throughput data transfer from the vision system

### Model-Based Adaptive Cruise Control & Autonomous Steering

- Devised a multi-mode ACC system in Simulink for NXP S32K144, deploying control logic via Stateflow to regulate set speeds and maintain safe following distances from up to 6 lead vehicles
- Tuned a PD controller for autonomous steering, attaining stable lane-keeping at 30 m/s and providing realistic force feedback through a haptic steering wheel

## SKILLS

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**Languages:** C, C++, Python, Verilog, ARM Assembly, FreeRTOS

**Hardware & Platforms:** Embedded Systems, PCB Design, Microcontrollers (STM32, NXP S32K144)

**Software & Tools:** Altium Designer, MATLAB/Simulink, Cadence Virtuoso, SPICE, NXP S32 Design Studio, VS Code, Git, STM32CubeIDE