

Valentino Cattaneo

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Electrical Engineering student specializing in electric system integration and avionics design of UAVs and electric aircraft, with hands-on research in motor drive technology and leadership in an award-winning student team.

EDUCATION

Purdue University, College of Engineering | GPA: 3.98/4.00

West Lafayette, IN
December 2027

Bachelor of Science in Electrical Engineering

- Concentration: Electric Power and Energy Systems

PROFESSIONAL EXPERIENCE

Purdue Power Electronics and Drives Research Lab

West Lafayette, IN

Undergraduate Research Assistant – Advised by Prof. Woongkul Lee

June 2025 – December 2025

- Created a dual 3-phase Field-Oriented Control (FOC) motor drive prototype for a 6-phase motor.
- Prototyped and deployed real-time FOC firmware on STM32, enabling closed-loop control of the dual drive.
- Simulated a 6-phase motor drive with 2 synchronized FOC loops in Simulink.
- Tuned and validated FOC control-loop and motor model parameters using oscilloscopes and LCR meters.
- Sketched and routed a magnetic encoder PCB in Altium, enabling high-resolution sensored control.
- Programmed the magnetic encoder over SPI to maximize sensored performance for UAV applications by optimizing the filtering window, pulses per revolution, and hysteresis of the IC.

TECHNICAL PROJECTS AND LEADERSHIP

Vertical Flight Systems Purdue, GoAERO Competition

West Lafayette, IN

President

August 2025 - Present

- Spearheaded a 30-member interdisciplinary team in the design of an autonomy-enabled, 230 kg eVTOL.
- Led student team to win the U.S. University Innovation Award in the GoAERO Competition, raising +\$74k.
- Drafted aircraft system requirements and coordinated system integration across all subteams.
- Drove the design, selection and integration of avionics and propulsion systems of a 32 kg scale demonstrator.
- Directed the demonstrator's flight-testing campaign from first takeoff through fully autonomous missions.
- Presented design reviews to faculty and industry advisors, translating subsystem tradeoffs into clear decisions.

Vice President

August 2024 – August 2025

- Programmed a preliminary iterative aircraft sizing algorithm using MATLAB.
- Conducted power calculations to select the drone's powertrain based on our sizing results.
- Sized battery cells and modules for the aircraft that met energy, discharge, and weight requirements.
- Designed a Battery Management System for the 14.4 kWh battery pack in Altium, enabling cell protection.
- Wired all propulsion components (ESCs, BMS, precharge circuits, HV to LV) using AutoCAD Electrical.
- Selected and interfaced critical avionics (GPS RTK, dToF, RC receiver and telemetry) in ArduPilot.
- Integrated autonomy hardware (NVIDIA Jetson, stereo camera, 2D LiDAR) with the avionics suite.
- Devised, soldered and validated all avionics power conversion & distribution circuits of the UAV demonstrator.

Custom 3D Printed, Autonomous, Indoor 5" Multirotor

May 2025 – August 2025

Personal Project

- Engineered and manufactured a custom drone and achieved autonomous indoor navigation without collisions.
- Implemented a custom LiDAR-based SLAM algorithm in C++ on a Raspberry Pi for autonomous indoor flight.

TECHNICAL SKILLS

Hardware Design: Altium, KiCAD, AutoCAD, LTspice, SOLIDWORKS, Fusion360.

Software & Embedded: Visual Studio, Simulink, Linux, Git, JIRA, Microsoft Office, STM32 CubeMX & CubeIDE.

Programming & hardware description languages: C, C++, MATLAB, Python, SystemVerilog.

Analysis & Methods: Requirements Flowdown, Verification & Validation (V&V), Fault Tree Analysis (FTA), Risk Assessment & Mitigation.