

Valentino Cattaneo

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Electrical engineering student specializing in electric propulsion systems applied to UAVs and electric aircraft, with research experience in motor drive technology and leadership in an award-winning student team.

EDUCATION

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

West Lafayette, IN

Bachelor of Science, Electrical Engineering

December 2027

- Concentration: Electric Power and Energy Systems

PROFESSIONAL EXPERIENCE

Purdue Power Electronics and Drives Research Lab

West Lafayette, IN

Undergraduate Research Assistant – Advised by Professor Woongkul (Matt) Lee

June 2025 - Present

- Created a dual 3-phase motor drive control algorithm to drive a 6-phase motor for UAV propulsion.
- Prototyped and deployed FOC firmware using STM32 software tools on our dual 3-phase drive.
- Designed schematic and layout of a magnetic encoder PCB in Altium and used it to perform sensed control.
- Debugged FOC mathematical blocks and model parameters using oscilloscopes and LCR meters.
- Simulated a 6-phase motor drive with 2 synchronized FOC loops in Simulink.
- Modeled and compared single vs. dual inverter efficiency to identify optimal operating regions in MATLAB.
- Wrote a single/dual inverter mode switching algorithm, improving efficiency at low power draw by 15%.

TECHNICAL PROJECTS AND LEADERSHIP

Vertical Flight Systems Purdue

West Lafayette, IN

President

August 2025 - Present

- Led student team to win the U.S. University Innovation Award in the GoAERO Competition raising +\$74k.
- Spearheaded 30-member interdisciplinary team in the design of an autonomy-enabled, 220 kg eVTOL.
- 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 to fully autonomous flight.
- Represented the team to industry and faculty advisors through technical presentations and design reviews.

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 to meet energy, discharge, and weight requirements.
- Developed a per-cell Battery Management System for a 100 V, 14.4 kWh battery pack.
- Selected and interfaced avionics (GPS RTK, dToF, RC receiver and telemetry) using ArduPilot.
- Integrated autonomy hardware (NVIDIA Jetson, stereo camera, 2D LiDAR) with the avionics suite.
- Devised, soldered and tested all avionics, step-down and power circuits of the demonstrator UAV.

Custom 3D Printed, Autonomous, Indoor Multirotor

Personal Project

May 2025 – August 2025

- Engineered and manufactured a custom UAV and achieved autonomous indoor navigation without collisions.
- Implemented a custom SLAM and obstacle avoidance algorithm in C++ using a Raspberry Pi and a 2D LiDAR.
- Performed LiDAR reference frame transformations to maintain accurate localization while tilting.

TECHNICAL SKILLS

Software: Altium, KiCAD, LTspice, Simulink, CCSTUDIO IDE, STM32 CubeMX & CubeIDE, SOLIDWORKS, Fusion360, Visual Studio, Visual Studio Code, Linux OS, JIRA, Microsoft Office Suite.

Software & Hardware Description Languages: C, C++, MATLAB, Python, SystemVerilog.

Analysis & Methods: Requirements Flowdown & Development, V&V, FTA, Risk Assessment & Mitigation, Real-Time Systems & Embedded Timing, Efficiency Mapping & Operating Region Optimization.