Caleb Oblepias

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Education

Vanderbilt University | Nashville, Tennessee **2023-2027**

- **M.S. Electrical & Computer Engineering (Accelerated Program), May 2027**
- B.E. Electrical & Computer Engineering, May 2027
- GPA: 3.93 | Minor, Computer Science
- Relevant coursework: Microcontrollers (ATmega328P), C++ Software Design, OS (Linux), Control Systems, Robotics

Activities

Electrical Engineer | Vanderbilt Aerospace Design Laboratory | NASA Student Launch Initiative **May 2025 - Present**

- Designing STM32-based rocket payload control system: ultra-low-power IMU sampling/filtering, dirt sampling actuation, electrical testing of soil, FSM, custom Altium PCB.
- Developing hardware-in-the-loop validation system using JSBSim-generated sensor data and STM32 testbench (bare-metal UART/I^2C/SPI drivers, FreeRTOS, SD logging), surfacing mission-critical bugs and verifying safe, nominal performance.

Electrical Team Lead | Vanderbilt Motorsports | Formula SAE **Aug 2023 - May 2025**

- Led design of competition wiring harness in SOLIDWORKS Electrical; managed power distribution, sensor integration, and safety systems while ensuring compliance with Formula SAE standards.

Accessibility Award Recipient | VandyHacks **2023**

- Created real-time rash identification website using webcam and machine learning via Tensorflow.js API.
- Received award provided by Fidelity recognizing accessibility and quality in the product.

Dean's List Finalist | Design Lead | FIRST Robotics **Aug 2019 - May 2023**

- Recognized among top student leaders for technical contributions, innovation, and outreach in robotics (2022). Led team in design and integration of mechanical, electrical, and software subsystems for competition robots.

Eagle Scout | Boy Scouts of America **2010 - 2018**

- Led a team to design, fabricate, and install lockdown shades for classroom door windows of local grade school, promoting security and safety of students.

Experience

Embedded Systems Intern | TT Electronics | Olathe, Kansas **May - Aug 2025**

- Designed and deployed embedded control system for automated tinning machine: custom STM32 PCB, bare-metal firmware for motion control, and Raspberry Pi GUI with UART-based opcode protocol.
- Programmed 6-axis FANUC industrial robot arm for PCB assembly automation, saving $18K+ in costs; integrated Modbus-based cell with PLC-controlled pneumatics, actuators, vision system, and Visual Basic interface.

Manufacturing Engineering Intern | TT Electronics | Olathe, Kansas **May - Aug 2024**

- Built and implemented acceptance test fixture for power supply product. Integrated variable load circuits, voltage monitoring, input filtering capacitors, clamping diodes, and ripple measuring to ensure compliance with electrical performance specifications.
- Utilized LEAN principles to optimize manufacturing processes, minimize variances, and pursue higher degrees of automation.

Skills

- **Programming:** C, C++, Python, Assembly, Matlab, Java
- **Embedded Systems:** STM32 (bare-metal), ATmega328P, FreeRTOS, FatFs, UART, I^2C, SPI, RS-485, Modbus
- **Electronics Design:** PCB design (KiCad, Altium), circuit simulation (LTSpice)
- **Tools:** Keil µVision, STM32CubeIDE, Linux, SOLIDWORKS Electrical, Fusion 360, Inventor