

Cole A. Smith

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EDUCATION

University of Virginia – School of Engineering and Applied Science

Charlottesville, VA

Major: Mechanical Engineering – Rodman Scholar (*awarded to top 5% of engineering class*)

May 2026

GPA: 3.4

ENGINEERING EXPERIENCE

Solar Car Team at UVA

Charlottesville, VA

Brakes & Steering Lead; Fmr. Member, Brakes and Steering and Embedded Teams

August 2022 – June 2026

- Led full-cycle engineering, manufacturing, and team operations as Brakes and Steering lead; ran design reviews, onboarded new members, and executed root-cause analysis to completely resolve previous mechanical stability failures for competition
- Modeled dynamic steering geometry and brake line pressures; developed custom adjustable steering shaft, ratcheting handbrake, and steering arms; executed mid-race suspension retrofit and structural reinforcement of the steering shaft
- Directed a 5-week emergency sprint to manufacture the vehicle's brakes, steering, and wheel assemblies from scratch, preventing disqualification and delivering the car to competition
- Designed an embedded driver heads-up display using Raspberry Pi and STM32; integrated CAN bus and LoRa for wireless telemetry and developed a custom ReactJS dashboard

Senior Capstone Project

Charlottesville, VA

Technical and Finance Lead

September 2025–April 2026

- Conceptualized, engineered, and tested an automated lawnmower safety system, designing a spring-loaded guard, rotary solenoid release latch, and ball screw stepper motor reset mechanism; managed budget and component procurement
- Built first-principles dynamic models and FEA simulations to size key actuators, including spring stiffness for target drop time, motor sizing for reset mechanism, and verifying guard deflection under impact

Composite Polymer Research Group

Charlottesville, VA

Undergraduate Researcher

June 2025 – August 2025

- Fabricated flexible temperature sensors from a PEDOT:PSS/Carbon Nanotube (CNT) composite, investigating the impact of both CNT-to-polymer ratio and serpentine trace geometry on improving thermal sensitivity
- Developed a characterization testbed using a National Instruments (NI) DAQ to analyze the stability of the sensor's resistance under hydrodynamic conditions; presented findings at a research symposium

Commonwealth Center for Manufacturing (CCAM)

Disputanta, VA

Manufacturing Processes Intern

May 2024 – August 2024

- Conceptualized and led an intern capstone project for a UR5 collaborative robot, overseeing timeline management and final demonstration to senior staff to enable automatic reorientation for heavy, cumbersome manufacturing assembly processes
- Engineered a custom pneumatic gripper and its full actuation system from concept to completion, handling CAD design, fabrication (Wire EDM), and integration with UR5 controls to enable vision and gesture-driven automatic part handling
- Developed and benchmarked two competing personnel tracking systems; one vision-based using ArUco tags and a second using custom ultra-wideband radio modules, achieving 10 cm precision at 5% the cost of commercial options

Lightstorm Research

Charlottesville, VA

Summer Intern

June 2022 – August 2022

- Designed and programmed a complete user interface for RP2040-based custom sensing units in MicroPython, integrating sensors, LCD display, user controls, memory, and wireless telemetry; developed functional breadboarded prototypes
- Assembled, reflow soldered, microscopically inspected, and flashed 50+ PCBs to validate sensor modules
- Implemented register-level sensorless stepper motor homing using current feedback to achieve closed-loop positioning for precision movement
- Diagnosed and rebuilt a custom circuit after thermal failure, disassembling, labeling, and replacing key components (Intel NUC boards) to restore reliable system operation

SKILLS AND CERTIFICATIONS

Design and Analysis: SolidWorks CAD (CSWA) and FEA, Siemens NX, Fusion 360, MATLAB, VBA

Fabrication: CNC Machining (CAM), Lathe, Mill, Waterjet, 3D Printing (FDM), PCB Assembly & Rework (SMT, Reflow, Hot Air)

Electronics and Software: PCB Design (KiCAD), STM32, ESP32, C++, Python (NumPy, Pandas, OpenCV), Java

Leadership and Activities: Eagle Scout, President of Phi Sigma Kappa, Jazz and Classical Flautist, Soloist for UVA Jazz Ensemble