Ethan Sanchez

484-502-6149 | essanchez02@gmail.com

EDUCATION

University of Pennsylvania; Philadelphia, Pennsylvania Expected May 2026
M.S. in Robotics GPA: 3.91/4.00

University of Colorado Boulder; Boulder, Colorado May 2024
B.S. in Mechanical Engineering, Minor in Computer Science GPA: 3.85/4.00

ENGINEERING EXPERIENCE

Graduate Research Assistant, Philadelphia, PA June 2025 - Present
Defense Advanced Research Projects Agency (DARPA) Triage Challenge

- Developed perception and sensing pipelines for mobile robots in the DARPA Triage Challenge
- Implemented contact-free respiration rate estimation using LWIR thermal imaging, facial tracking, and signal processing for real-time vital assessment
- Integrated robot-mounted microphone input with OpenAI Whisper to enable on-board speech transcription
- Built RGB camera auto-exposure script with multi-exposure fusion to produce HDR images for reliable nighttime visual perception for vision language models (VLMs)
- Migrated perception and sensing pipelines from ROS1 to ROS2, resolving compatibility and timing issues
- Integrated differential GPS to improve global localization and heading accuracy in outdoor environments
- Co-authored an arXiv research paper on a heterogeneous multi-robot triage system developed for the DARPA Triage Challenge (arXiv:2512.08754)

Project Management Intern, Fayetteville, AR May 2023 - Aug. 2023
Zone 4 Systems Integration and Design

- Tracked daily build progress and work hours using Procore construction management software
- Completed quality control inspections of Walmart's Alphabot pickup order fulfillment system
- Collaborated with bilingual foreman on a Spanish speaking job site to identify inventory deficiencies and coordinate replacement orders to avoid build stops

Undergraduate Research Assistant, Boulder, CO May 2022 - Aug. 2023
THING Lab at the University of Colorado

- Designed a magnetically actuated robotic system for experimental research on remote physical interactions
- Prototyped mounts to integrate servo-driven mechanism, RFID sensing, and a custom PCB onto Toio robots
- Engineered a Scotch Yoke mechanism for controlled magnetic actuation within the robotic platform

Mechatronics Intern, Philadelphia, PA May 2016 - May 2020
Exyn Technologies

- Modeled drone sensor mounts, electronic enclosures, and flight simulation environments using SolidWorks and Fusion 360 CAD software
- Prototyped and iterated designs using MakerBot Replicator 2 and Formlabs Form 2 3D printers
- Wired and programmed Teensy and PSoC microcontrollers using I2C and SPI communication protocols
- Programmed a point cloud visualization application for an Oculus Rift S headset in C# using Unity

PROJECTS

Robotics Engineer, Philadelphia, PA Jan. 2026 - May 2026
RoboRacer Course at the University of Pennsylvania

- Modified, programmed, and raced a 1/10th scale autonomous vehicle using ROS2 for control and navigation
- Implemented PID control, reactive planning, and SLAM for vehicle localization and navigation
- Developed advanced racing strategies, including optimal racing lines and real-time path planning
- Gained hands-on experience with autonomous vehicle hardware, software, and real-world testing

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Robotics Engineer, Philadelphia, PA Oct. 2025 - May 2026

Capstone Project at the University of Pennsylvania

- Reverse engineered Berkshire Grey FlexBot differential-drive robots, disassembling and documenting mechanical, electrical, and sensing subsystems
- Mapped wiring, connectors, and communication protocols across multiple custom control boards and sensors
- Investigated motor control pathways and feedback interfaces to enable external navigation commands
- Produced technical documentation and repositories to support long-term reuse by research groups
- Integrated a VLP-16 LiDAR and onboard CPU and ran SLAM to enable autonomous navigation

Electromechanical Engineer, Boulder, CO Aug. 2023 - May 2024

Senior Capstone Project at the University of Colorado

- Integrated electromechanical components (stepper motor, DC motor, solenoid) to assistive fishing device to enable casting distances up to 35 feet and variable reeling speeds
- Programmed Teensy microcontroller to enable individuals with spinal cord injuries to control device functionality via sip and puff tubes
- Created custom PCB with back current protections to compactly house electrical components, ensuring durability and functionality in a waterproof design

Mechanical Engineer, Boulder, CO Jan. 2023 - May 2023

Component Design Course at the University of Colorado

- Gained experience using saws and mills while manufacturing components for a drill powered tricycle
- Used precision boring head to get a hole with a tolerance of 6 thou in order to press fit a bearing
- Designed a robust chassis with optimized gearing to guarantee smooth performance under high loads, successfully hauling 875 lbs uphill

INDEPENDENT LEARNING

Self-directed video game development

- Created and animated a skeletal mesh of a transformer to be used in Unreal Engine.
- Implemented movement, projectile, and other game logic using Unreal Engine blueprint scripting

SKILLS: SolidWorks, Fusion 360, MATLAB, Simulink, PCB design, object-oriented programming, C++, Python, Git, Resilience, Communication, Interdisciplinary Collaboration

RELEVANT COURSEWORK: Applied Machine Learning, System Dynamics, Intro to Robotics, Mechatronics