Tyler Harp

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA
Master of Science in Robotics | School of Computer Science | December 2025
- School of Computer Science, GPA 4.0/4.0

Bachelor of Science in Mechanical Engineering & Robotics | May 2023
- College of Engineering, GPA 3.97/4.0

RELEVANT EXPERIENCE

Autonomy Software Engineer | Stealth Startup | January 2025 - Present
- Led object detection model data collection, annotation, and training pipelines for drone anti-poaching data
- Built out augmented reality overlays and detection mapping features for real-time situational awareness
- Developed on-device infrastructure like CI image builds, live video streaming, video recording, and LoRa vehicle trackers

Robotics Graduate Researcher | AirLab | Fall 2023 - November 2025
- Designed the autonomy and perception for a powerline-charging VTOL using classical and learning-based vision methods
- Researched mapping algorithms for deep learning-based depth estimation in ROS, utilizing OpenCV and PCL libraries

Robotics Software Engineer Intern | Symbotic | Summer 2024
- Led full production software deployment of a ROS and C++ based test stand for warehouse robot diagnostics
- Wrote a Bash-based continous delployment pipeline for the test stand and its companion computer
- Developed a proof-of-concept camera calibration system using OpenCV and AprilTags for onboard robot cameras

Robotics Software Engineer Intern | Gecko Robotics | Summer 2023
- Prototyped an Adaptive Extended Kalman Filter using Python for wheel encoder sensor fusion on NDT-inspection robots
- Implemented the A-EKF in real-time using C++ and ROS2 using Docker, Git, and Ubuntu

Mechatronics Engineer Intern | Advanced Optronics | Spring 2023 (Part-Time)
- Wrote C++ ESP Firmware for reading MEMS capacitive sensors for medical cochlear implant electrodes
- Created and iterated on custom PCBs for sensor reading hardware
- Wrote a Python client for parsing incoming data and running data analysis and visualization

PROJECTS

Gaussian Splatting Mapping with Learning-based Depth Estimation | Spring 2024
- Designed a pipeline for integrating depth maps and camera poses into a Gaussian Splatting SLAM algorithm
- Evaluated GS-SLAM's ability to mitigate noise biases from state of the art monocular and stereo depth estimation models

CoralBot Autonomous Coral Reef Surveying Robot | Spring 2023
- Created an autonomous, IMU-guided boat to survey reef health metrics
- Programmed Python architecture on Raspberry Pi to control microcontroller actuation and data collection subsystems

Jenga-Stacking Robotic Arm Manipulation | Fall 2022
- Programmed a robotic arm in MATLAB to stack Jenga blocks in a uniform pattern using a feeder
- Applied Inverse Kinematics, Trajectory Planning, and Homogeneous Transforms to optimize arm motion and controls

C++ Roller Coaster Simulator | Spring 2021
- Developed a C++ Object Oriented 2D Roller Coaster Simulator with graphics and user interface
- Programmed a 4D state-space model of car interaction to create a physics based simulation

SKILLS

Software: Python, C++, ROS/ROS2, Rust, Bash, Linux, PX4, ArduPilot, Isaac Sim, Gazebo, SolidWorks
DevOps: Docker, Git/GitHub/GitLab, Google Cloud, CVAT, Supabase
Libraries: Eigen, Open3D, OpenCV, Pandas, PCL, PyTorch
Hardware: CAD, FDM 3D Printing, Manual Machining, Motor Control Systems, PCB Design, Rapid Prototyping, Soldering

RELEVANT COURSES

C++ for Engineers	Computer Vision	Robot Kinematics & Dynamics
Planning in Robotics	Visual Learning & Recognition	Robot Localization & Mapping

ADDITIONAL EXPERIENCE

Student-Athlete, Varsity Soccer Team, Carnegie Mellon | 2019-2023
Army ROTC Cadet, Assistant Head of Planning & Operations | 2021-2023
CERLAB Research Assistant working on the Autonomous Welding Robot | 2021-2022

LEADERSHIP & HONORS

Distinguished Military Graduate, Top 20% of Cadets in the nation | 2023
Tau Beta Pi Executive Board Engineering Honor Society | 2021-2023
Pi Tau Sigma Executive Board Mechanical Engineering Honor Society | 2021-2023