Ethan J. Musser

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EDUCATION

University of Pennsylvania, School of Engineering & Applied Science — Expected Graduation May 2022
Master of Science in Engineering, Robotics — GPA: 3.75/4.00

Temple University, College of Engineering — Graduated May 2020
Bachelor of Science, Mechanical Engineering — *cum laude*

Relevant Coursework:

- Model Predictive Control
- Nonlinear Control
- Robotic Manipulation
- Legged Locomotion
- Advanced Dynamics
- Autonomous Racing
- Mobile Robotics
- Mechatronics

EXPERIENCE

Graduate Researcher — March 2021 – Present
*Kod*Lab (GRASP Laboratory)* — *Philadelphia, PA*

- Design for manufacture and assembly a 13-degree-of-freedom quadrupedal robot with an actuated coronal-plane spinal rotation that can execute highly-dynamic, active-spine behaviors in challenging environments
- Designed and simulated controllers for bounding and pronking gaits on an 8-degree-of-freedom quadruped in C++
- Modeled full SolidWorks assemblies of two quadrupedal legged robots, each containing over 100 unique parts

Research Assistant — May 2019 – March 2021
Temple Robotics and Artificial Intelligence Laboratory (TRAIL) — *Philadelphia, PA*

- Collaborated with PI to develop an optimal, 3D quadrotor path-planner using OMPL and Google OR-Tools in ROS 1 for use in at-sea inspection of ship substructure and superstructure
- Created a follower controller that mimiced vehicle acceleration and braking profiles while following another vehicle on the Duckiebot mobile robot platform

Lead Data Acquisition Engineer — January 2019 – May 2020
Temple Formula Racing (Formula SAE Student Organization) — *Philadelphia, PA*

- Implemented a data acquisition unit — including Hall effect sensors, strain gauges, linear potentiometers, rotary encoders, and inertial measurement units — to measure parameters of vehicle steering and suspension dynamics
- Coordinated a five-member team to establish and maintain a timeline to complete a project for an external sponsor, meeting deadlines and maintaining a $1,250 budget
- Identified design requirements, constraints, and objectives through professional interviews and surveys

Teaching Assistant for Linear Systems & Computer-Aided Design Courses — January 2019 – May 2020
Temple University College of Engineering — *Philadelphia, PA*

- Developed lesson plans and instructed students as a class and through one-on-one tutoring sessions

Student Machinist — August 2018 – May 2019
Temple University College of Engineering Machine Shop — *Philadelphia, PA*

- Designed and produced components for academic use, employing precise subtractive manufacturing methods
- Provided individual and group lessons on machine operation, machining practices, and part design

Product Development Intern — May 2018 – August 2018
Blade Diagnostics Corporation — *Pittsburgh, PA*

- Designed and fabricated a testing fixture which rapidly validated the frequency response of several hundred speakers
- Designed for manufacture and assembly components for use in an integrally bladed rotor testing platform in PTC Creo
- Collaborated with supervisors to prepare parts and bills of materials for manufacturing

TECHNICAL SKILLS

Design:	SolidWorks, PTC Creo Parametric, Simulink, ANSYS Mechanical & Fluent, NI LabVIEW, MotionGenesis Kane, AutoCAD, Design for Manufacture & Assembly (DFMA)
Programming:	Python, C++, MATLAB, Robot Operating System (ROS 1 & 2), Git, Docker, Bash, Java
Fabrication:	Haas CNC Vertical Mill & Lathe, CNC Router, Manual Vertical Mill & Metalworking Lathe, Fused Deposition Modeling (FDM) 3D Printing, TIG Welding, Carbon Fiber Layup, General Shop Tools