

Jason Friedman

966 Countess Dr. | Yardley, PA 19067 | 215-478-4768 | jasonfriedman27@gmail.com | [linkedin.com/in/jason-r-friedman](https://www.linkedin.com/in/jason-r-friedman) | [jason-friedman.me](https://www.jason-friedman.me)

EDUCATION

University of Pennsylvania | School of Engineering and Applied Science | Philadelphia, PA

Master of Science in Engineering: Robotics | GPA: 3.56

May 2023

Bachelor of Science in Engineering: Mechanical Engineering | Minors: Computer Science & Mathematics | GPA: 3.95

May 2022

Activities/Leadership: ASME Podcast Host; Club Baseball; Discrete Math (CIS-160) TA; Netter Center MAS CS volunteer coordinator

Awards: Tau Beta Pi Engineering Honor Society (President); Summa Cum Laude; 2022 Senior Design Technology Integration Award; 2020 Netter Center Civic and Community Engagement Award; 2018-19 Dean's List

Coursework: Intro to Robotics; Mechatronics; F1/10 Autonomous Racing Cars; Optimal Feedback Control; Artificial Intelligence; Integrated Computer-Aided Design, Manuf. & Analysis; Materials & Manuf. for Mechanical Design; Engineering Entrepreneurship

PROFESSIONAL EXPERIENCE

Autoware & xLab, Mechatronics Intern | Philadelphia, PA

March 2023 – Present

- Won 1st place at the 2023 Purdue Autonomous Karting Series, using our custom “Autonomous for Electric” AV4EV GoKart
- Built and documented autonomous drive, brake & steer subsystems, including motors, sensors, controllers & transmission
- Fabricated “Autonomy Kit,” selecting and packing all MCU's, switches, wires, and GNSS into a small (<1 ft³) insulated box

Tesla Motors, Mechanical Design Engineering Intern | Palo Alto, CA

May 2021 – August 2021

- Worked on Tesla's Energy Residential Hardware Engineering team, focusing on Powerwall and Meter Socket Adapter (MSA)
- Designed and prototyped MSA battery housing, prioritizing functionality, DFMA, installation, aesthetics, safety, and cost
- Supported CFD simulation by producing CAD models, engineering drawings, and thermal heat dissipation measurements

Sung Robotics Lab, Research Assistant | Philadelphia, PA

June 2019 – May 2021

- Created Lagrangian dynamic model for a bistable aircraft with both quadrotor and fixed wing equilibrium states
- Developed compliant gripper robot, employing bistability for passive actuation solely from contact with object
 - Performed mechanical design, MATLAB modeling/simulation, data analysis, CAD, and literature review
 - **Push On, Push off: A Compliant Bistable Gripper with Mechanical Sensing and Actuation** | IEEE RoboSoft 2021
- Designed complex origami folding pattern for REBOund robot, utilizing stored spring-like energy to actuate jumping motion
 - Fabricated robot via laser cutting and folding Mylar; performed MTS/Vicon testing and data collection/analysis
 - **REBOund: Untethered origami jumping robot with controllable jump height** | IEEE ICRA 2020

ADDITIONAL PROJECTS

F1Tenth Autonomous Racing

January 2023 – May 2023

- Implemented ROS2 reactive racing algorithms for path planning/following and controls, such as pure pursuit, RRT, and MPC
- Mapped various tracks with SLAM, then localized the car via particle filter, using both Hokuyo LiDAR and RealSense camera

Optimal Control of Human Body Tasks

October 2022 – December 2022

- Performed real life motion capture then OpenSim simulation of human movements, using a 21-DoF musculoskeletal model
- Implemented MATLAB control via quadratic programming, optimizing over various dynamic and biological costs/constraints

BoomBoat, Autonomous Oil Spill Cleanup: Senior Design Project

August 2021 – April 2022

- Built autonomous oil spill containment device, with 2 RC boats connecting 1 inflatable boom which finds & surrounds the oil
- Localized boats & oil using AR tags & color thresholding, then followed A* search path using Pure Pursuit and PID control

Self-Driving Car: Mechatronics Final Project

November 2021 – December 2021

- Built an HTML webpage-controlled car, integrating battery, circuitry, sensors, actuators, C++ code, and mechanical design
- Focused on autonomous functionality: (X,Y) Vibe location control, wall-following via ultrasonic sensors, LED beacon-tracking

PANDA 7-DoF Robot Arm: Pick and Place Challenge

October 2021 – December 2021

- Implemented Python forward & inverse kinematics, simulated in Gazebo environment, and wrote A* & RRT path planners
- Actuated the gripper to detect wooden blocks, pick up and conditionally reorient them, and accumulate 1 tall stack

SKILLS & INTERESTS

Technical Skills: *Manufacturing:* Haas CNC MiniMill; TL-1 Lathe; 3D Printing; Laser Cutting; Injection Molding; Carbon Fiber Layup

CAD/CAM: SolidWorks; MasterCAM; CATIA; SolveSpace; *Software:* ROS2; GitHub; Simulink; LaTeX & Overleaf; Squarespace; OpenSim

Programming Languages: Python; C++; MATLAB; C; Java; Arduino; HTML; *Data Collection:* MTS Instron; Vicon MoCap; Oscilloscope

Personal Interests: Teaching; planning social events; sports & fitness; psychology & mindfulness; traveling; music; politics