
Objective

A position in the **robotics** field. Specific interests include autonomous navigation, path planning, artificial intelligence, and mechatronics.

Skills

Software: Python, C/C++, HTML, Matlab/Simulink, Arduino, Git/GitHub, Linux Robotics: ROS, OpenCV, RViz, Gazebo, PCL, V-Rep, Move-It
General: Microsoft Office (Word, Excel, Project, PowerPoint, Outlook, Visio) CAD: Solidworks, ANSYS (FEA), Autodesk Eagle (PCB Design)

Education

Northwestern University (2017 - 2018) **GPA: 3.80/4.00**

Major: M.S. in Robotics || Graduated: December 2018

Areas of Focus: Autonomy, Path Planning, Computer Vision, Embedded Systems, Mechatronics, AI, Robotic Manipulation, Controls

Milwaukee School of Engineering (2013 - 2017) **GPA: 3.76/4.00**

Major: B.S. in Mechanical Engineering || Minor: Mathematics

- Tau Beta Pi Engineering Honor Society
- Featured in the 2016 edition of *Who's Who Among Students in American Universities & Colleges*
- Team participant for NASA's Space Grant Collegiate and Midwest Rocket Competitions
- Co-Founder and Vice President of JAM (Jewish Association of MSOE)
- Dean's List with high honors for all 4 years
- Received merit, diversity, and presidential achievement scholarships

Experience

Yaskawa America · Buffalo Grove, IL – *Engineering Intern* June 2017 – August 2017

- Repaired semiconductor robots in a cleanroom environment and performed repeatability tests
- Developed spindle test frames and a path-test fixture for assessment purposes, using machining and Solidworks design

Yaskawa America · Santa Clara, CA – *Engineering Intern* June 2016 – August 2016

- Debugged high-priority firmware issues using Lua
- Updated the API library, Web User Interface, and Quick-Start guides for motion controllers

Wisconsin Space Grant Consortium (WSGC) · Milwaukee, WI – *Elijah High Altitude Balloon Payload Intern* May 2014 – August 2014

- Designed and launched a NASA-funded balloon payload and analyzed the data received, using electrical circuits and Arduinos; published a report and presented the results at the WSGC conference along with 5 team members

Projects

Visit my portfolio for a more detailed list of relevant projects – mechwiz.github.io/Portfolio/

Robotics

September 2017 – December 2018

- **Simulating the Effect of Planning Depth in Predator-Prey Behavior** – developed a ROS package to control 2 Sphero robots (acting as the prey and predator) using an image-feedback loop to follow pre-determined paths generated from POMDP models in a custom built 3-D honeycomb-styled environment; used ROS, Python, OpenCV, Solidworks, image-stitching, path-planning, controls, and laser-cutting
- **Line Following Robot** – wrote an Android image-processing app for a custom designed robot to follow a line; used EAGLE to design the PCB, the MPLAB IDE to program the PIC32 microcontroller that controls the DC gear motors, Android Studio to write the app, Solidworks to design the laser-cut chassis, and 3D-printing to fabricate the wheels
- **Autonomous Frontier Exploration using Clearpath Robot & LiDar** – programmed a Clearpath Jackal UGV to explore and map an unknown area autonomously; used the ROS Navigation Stack, SLAM and the Point Cloud Library for pointcloud processing
- **DC Motor Trajectory Follower using PID Control** – implemented a motion controller to enable a DC motor to track reference trajectories; used C, MATLAB, and the PIC32 microcontroller
- **Web UI for Skill Learning & Acquisition** – developed a Web UI to assist college-aged students to learn and acquire new skills; used HTML/CSS/JavaScript and HCI principles
- **Robotic Maze Navigation** – developed path planning algorithm for a robot to navigate a ball through a maze; used ROS and Python
- **Plinko Game** – simulated a prism navigating a game board; used Lagrangian dynamics, impact laws, constrained forces, and Mathematica
- **Computer Vision** – created a “finger sniper” game that involves histogram-based skin color segmentation, gesture detection, and morphological operations; used OpenCV, Pygame, and Python
- **Robotic Manipulation** – modeled a mecanum-wheeled-robot's end-effector to move to a specified location; used rigid body transformations, forward and inverse kinematics, controls, odometry, Python, and V-Rep

Aquaponics Energy Systems Design for Natural Green Farms

September 2016 – May 2017

- Designed an aquaponics facility's multi-room airflow system and considered various renewables to boost energy efficiency; created a Simulink model to project cost, energy usage, and annual CO₂ emissions

Linear Motion Actuator with Feedback Control

December 2016 – February 2017

- Implemented state variable feedback control for a motor-driven linearly actuated belt, pulley, and cart system for various step and ramp inputs, loading conditions, and 2% settling-time constraints; used Matlab and Simulink

Milwaukee Sustainability Project

September 2016 – November 2016

- Co-managed a 20-student class-project that developed a technological energy system solution for parts of Milwaukee based on input from the Office of Sustainability and other stakeholders; project incorporated ideas such as food growing, solar energy, composting, stormwater collection, and heating/cooling