Jonathan Heidegger

jheidegg@umich.edu
jheidegger
+1 317-840-9013
heideggerlabs.com

DoD: Secret Clearance

Education

Master of Science | *Robotics* University of Michigan | *Aug 2022 – Present* | *GPA:3.67*

Relevant Courses: Math for Robotics, Mobile Robotics Systems, Avionics Navigation and Guidance of Aerospace Vehicles, Deep Learning for Robotics

Bachelor of Science | *Computer Science Honors* Purdue University | *May 2015 – August 2019* | *GPA: 3.8*

Relevant Courses: Robotics Systems, Operating Systems, Data Structures and Algorithms, Software Engineering

Technical skills

Programming Languages	C/C++, Python, Java, Matlab ,Julia, Bash
Development Environments/Tools	ROS2, Docker, Git ,UNIX, CI/CD Atlassian Suite

Work Experience

Air Force Research Laboratory | *Summer 2023* *Albuquerque, NM*
Graduate Researcher

- Researched and implemented adaptive control methods for satellite proximity operations
- Implemented Model Reference Control for a marginally stable reference model and conducted stability analysis and proofs
- Delivered a python control simulation for both discrete and continuous time with options for interfacing with embedded hardware in the future

Vehicle Optimization, Dynamics, Controls & Autonomy Lab | *2022 – Present* *Ann Arbor, MI*
Graduate Research Assistant

- Led student team of 3 undergraduate researchers in developing a new hardware platform for control research.
- Researched novel methods for close proximity spacecraft control using mobile holonomic robotics as an experimental platform for hardware validation
- Implemented and tested a novel data-driven learning reference governor for constraint satisfaction despite uncertainty of the dynamics
- ROS2 full stack robotics development, C++, Python creating portable images with Docker
- Micro-ROS and embedded C++ programming with Raspberry Pi Pico SDK for hardware interfacing
- Presented and coordinated with external stakeholders through quarterly technical briefs

Rolls Royce North America | *Summer 2021,2022* *Indianapolis, IN*
Controls Engineering Intern

- Created interface layer for legacy engine software development in Ada for hardware unicorn emulator
- Developed automated testing suite for a legacy code base added to Jenkins CI.
- Researched and presented a market readiness analysis of modern concurrent safety critical real-time operating systems for engine control applications.

Projects

X-14 ROV | *Captain, Lead Developer* 2019-2022

- Managed the technical delivery of a fully student designed and manufactured ROV and ensured compliance with mission and safety requirements
- Coordinated 30 person interdisciplinary team setting technical milestones
- Developed full stack software control architecture and kinematics for 6DoF thrust mapping calculations for an underwater ROV autonomous and teleoperated control

Purdue Collaborative Robotics Lab | *Undergraduate Research Assistant* 2020-2022

- Applied existing omnidirectional robots with custom modules for response to respiratory pandemics and small batch manufacturing
- Implemented custom path planner with a ROS navigation stack for consistent UV disinfection dosage from the robot
- Published as lead author for REMAR 2021 conference on modular robotics

Leadership and Extracurriculars

Purdue All-American Marching Band | *2018-2021* *West Lafayette*
Drum Major, Section Leader

- Represented and led the 400 member All-American Marching Band
- Responsible for interfacing between 6 full time staff and 60 student leaders
- Instructed both drill rehearsals and conducted music rehearsals
- Managed the band in the stands working directly with TV and local producers to integrate the band into the run of show

Kappa Kappa Psi | *2019-2022* *West Lafayette IN*
President,Vice President

- National Honorary College Band Service Fraternity
- Supported the Purdue Band and presently the Michigan Band program through volunteer service for the betterment of the college band experience
- Led on of the largest chapters in the country with 70 active members and led the executive board

Purdue FIRST Programs | *2019-2022* *West Lafayette IN*
Mentor, Regional Event Member

- FIRST Robotics is a high school robotics mentorship program dedicated to the inspiration of science and technology
- Directly supported local teams with volunteer mentoring throughout the year teaching students to program and build control systems
- Worked with regional managers to set the logistics for the competition events in the spring hosting 30-40 teams over a weekend of competition

Boston Crusaders Drum and Bugle Corps, Colts Drum and Bugle Corps | *2018-19, 2021*
Mellophone Section Leader

- Competed and performed at the highest level of the marching arts touring across the United State performing over 30 shows a summer with 150 members
- Managed the section of 20 Mellophones through preseason and summer helping new members complete a successful summer through music and physical preparation.