Grayson Snyder

(765) 650-0970 | graysonsnyder2025@u.northwestern.edu | snydergi.github.io | linkedin.com/in/graysonsnyder

EDUCATION

MS in Robotics | Northwestern University, Evanston, IL **Sep 25 (Expected)**

BS in Mechanical Engineering | Rose-Hulman Institute of Technology, Terre Haute, IN **May 24**

PROFESSIONAL EXPERIENCE

Shirley Ryan AbilityLab | Chicago, IL **May 25 - Current**

Robotics Engineering Intern – Legs + Walking Lab, Pons Lab

- Worked to improve post-stroke patient recovery with ExoMotus-X2 lower-limb exoskeleton in physical therapy setting
- Developed variety of LSTM models in Python with PyTorch for real-time predictions on low-latency C++ hardware
- Created ROS Noetic node to integrate with CAN communication system within large preexisting codebase

DEKA Research & Development | Manchester, NH **May 23 - Sep 23**

Controls Engineering Intern – Robotics Path-Planning Team

- Updated and improved legacy C++ code, adding new features and functionality with dynamic spin controller
- Researched and programmed B-Spline path smoothing algorithm for optimal curve trajectory in Python
- Tested code extensively in RViz2 and real environments to ensure robustness to situational variability

Rose-Hulman Institute of Technology | Terre Haute, IN **Sep 23 - Aug 24**

Teaching Assistant – ME430 Mechatronics and ME/CSSE435 Robotics Engineering

- Guided students with development of Arduino, PLC, Raspberry Pi, and MATLAB projects and labs
- Covered microcontrollers, design of circuits, serial communication, PLC, Rasp. Pi, MATLAB GUI, Python/JS MQTT

Endress+Hauser Temperature+System Products | Greenwood, IN **May 22 - Sep 22**

Industrial Engineering Intern

- Optimized machine layout in AutoCAD to reduce movement and drive throughput/efficiency through lean principles
- Reviewed and updated work instructions on production floor for proper care and maintenance of machines

Rose-Hulman Ventures | Terre Haute, IN **May 21 - Sep 21**

Mechanical Engineering Intern

- Collaborated with major orthopedic company on fabrication and automation of surgical tool to reduce operator fatigue

PROJECTS

7-DOF Food Preparation

- Team prepared toast in a toaster using an Emika Franka Panda robot arm with ROS2 Jazzy in Python
- Utilized custom MoveIt wrapper to simplify robot moves for various path-planning and goal states
- Managed transform tree built with CV system using RealSense camera and AprilTags to localize robot and scene
- Handled autonomous service and action calls using multi-threaded executor and asynchronous functions

Computer Vision Robot System

- Coded image processing pipeline for RealSense camera to isolate contour and centroid of pen with OpenCV
- Designed custom calibration sequence to be performed by arm to account for deviation in camera to arm transform

Robotic Path-Planning Simulations in Python

- Led creation of Recursive Backtracking algorithm to solve random mazes generated with teams' Prim's algorithm
- Implemented Rapidly Exploring Random Tree algorithm to simulate robot path-planning through obstacles

2-DOF Cable-Driven Planar Robot Arm

- Iterated design in SolidWorks and fabrication with considerations for functionality, robustness, and cost
- Designed for use of control systems including PID, feedforward, force, and motion to allow broad applicability

SKILLS

Robotics: ROS2/ROS, Computer Vision, Gazebo, MoveIt, Nav2, RViz2, CANopen, PyTorch

Software: Python, C++, Linux, Git, Embedded C, Unit Testing, MATLAB, HTML/CSS/JS, Jekyll

Hardware: SolidWorks, Machining, Fabrication, Raspberry Pi, PIC32, Arduino, PLC, AutoCAD, Bond Graph

Leadership: RHIT Orientation Leader, RHIT Quality of Education Committee, Pi Kappa Alpha Exec Board, Eagle Scout