Grayson Snyder

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EDUCATION

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

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

PROFESSIONAL EXPERIENCE

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
- ME430 covered use of microcontrollers, design of circuits, serial communication, and PLC implementation
- ME/CSSE435 covered use of Raspberry Pi, MATLAB GUIs, Python/JS MQTT communication

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
- Conducted time-studies of all machines and multiple products for routing verification

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
- Mentored by Senior Engineer in group setting while conducting independent work enabling growth and learning
- Extensively used SolidWorks, 3D printing, waterjet, and machining for rapid prototyping and concept generation

PROJECTS

Computer Vision Robot System

- Coded image processing pipeline for RealSense camera to isolate contour and centroid of pen with OpenCV
- Applied coordinate frame transform between camera and robot arm for end-effector trajectory planning
- 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

- Began development of 2-DOF cable-driven planar robot arm for teaching implementations of control theory
- 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

Interactive, Automatic Dog Treat Dispenser

- Programmed ATmega2560 microcontroller to interact with I/O including buttons, LEDs, and force sensors
- Utilized Special Function Registers to accurately control motors and LCD

SKILLS

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

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

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