Justin Abel

Software/Robotics Engineer

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA

Master of Science in Robotics *08/2018*

GPA: 3.87/4.0

Thesis: "A Rapid and Robust Approach to Robotic Leaf Grasping and Automated Crop Spectroscopy"

Bachelor of Science in Mechanical Engineering *05/2017*

GPA: 3.67/4.0

RELEVANT COURSES

Computer Vision	Numerical Methods	Kinematics, Dynamic Systems, & Control
Machine Learning	Mobile Robots	Robotic Systems & Internet of Things

SKILLS

Languages: C++, C, Python, JavaScript, HTML, CSS
Technologies/Tools: Git, CMake, Unix/Linux, Docker, Robot Operating System (ROS), GitLab CI/CD
Other Applications: MATLAB, Solidworks, AutoCAD, Arduino

WORK EXPERIENCE

Software Engineer *08/2018 - Present*

Boeing - Research and Technology, Charleston, SC

- Developing algorithms for optimizing robotic task sequencing and motion planning
- Created web based applications and 3D visualization tools to provide engineers with simple and scalable interface to custom robot planning algorithms
- Built up continuous integration and continuous delivery pipeline to automate testing, containerization, and deployment to cloud environment

Robotics Engineer (Contractor) *12/2017 - 05/2018*

Edge Tech Labs, Arlington, VA

- Implemented autonomous navigation and path planning capability of a mobile robot using ROS
- Integrated stereo cameras and lidar for localization, indoor mapping, and obstacle detection
- Performed sensor fusion of wheel odometry, visual odometry, and accelerometers into Kalman filter for improved robot state estimation

Mechanical/Robotics Intern *05/2016 - 08/2016*

Field Robotics Center - Robotics Institute, Pittsburgh, PA

- Helped integrate GPS into an agricultural robot and develop autonomous in-field navigation algorithms based on GPS waypoint following and crop row detection
- Designed and manufactured many custom components for agricultural based robotic systems

ACADEMIC PROJECTS

Autonomous Leaf Detection and Manipulation *05/2017 - 08/2018*

Masters Research - Carnegie Mellon University

- Working on a small team to develop a mobile robot used to autonomously survey and phenotype crops (mainly sorghum) in a large scale agricultural setting
- Used 3D reconstruction techniques to detect and grasp leaves for automated spectroscopy
- Trained a neural network to predict compositional traits of the plant (i.e. protein, cellulose)

Thermal Simulation at the Nanoscale *03/2015 - 09/2016*

Nanoscale Transport Phenomena Lab - Carnegie Mellon University

- Developed custom MATLAB and C code to run nanoscale Monte Carlo ray-tracing simulations for thermal property calculations in nanoscale structures (published)

ACTIVITIES & HONORS

Dean's List, College of Engineering, CMU: Fall 2013 - Spring 2017
Teaching Assistant, CMU: 2016 - 2018 (Numerical Methods, DIY Design and Fabrication)
Elementary School Mentor/Volunteer: Be A Mentor, Charleston, SC