Reed Johnson

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EDUCATION

University of Minnesota - Twin Cities — Minneapolis, Minnesota
College of Science and Engineering — *September 2013 – May 2017*
Major: Bachelor of Science in Mechanical Engineering — GPA: 3.76

University of Minnesota - Twin Cities — Minneapolis, Minnesota
College of Science and Engineering — *Expected March 2020*
Major: Master of Science in Mechanical Engineering

SKILLS & RELEVANT COURSES

- **Software:** SolidWorks, Creo Pro/E, Unigraphics NX, Autodesk Inventor, AutoCAD, ROS, MATLAB, Microsoft Office, Excel, EAGLE
- **Machines:** Mill, Lathe, Band Saw, Drill Press, Laser Cutter, 3D Printer

▪ Advanced Control System Design	▪ Deformable Mechanics	▪ Python
▪ Electrical Circuits	▪ Computer Aided Engineering	▪ C++
▪ Robotics Sensing and Estimation	▪ Analog and Digital Control	▪ Mechanisms and Machine Design

EXPERIENCE

Boon Logic — Minneapolis, Minnesota
Machine Learning Engineer — *June 2019 – Present*

- Assisted in developing an unsupervised machine learning algorithm for automated anomaly detection for sensor applications
- Designed the mechanical aspects, including hardware and mounting, of an automated visual inspection machine for detecting particulates in bottles
- Programmed Siemens and Omron PLCs using ladder logic and structured text languages

Mechanical Engineering Department - University of Minnesota — Minneapolis, Minnesota
Graduate Teaching Assistant — *August 2017 – May 2019*

- Designed a 10 week supplemental lab course to an introductory robotics class using two UR5 robotic arms for 40+ students
- Modeled and manufactured experimental fixtures and PCBs for the lab modules
- Wrote detailed lab manuals and assisted in the writing of tests for the course

Danfoss Power Solutions — Plymouth, Minnesota
Mechanical Engineer — *May 2017 – May 2019*

- Assisting in the development of an autonomous utility tractor utilizing LIDAR, RADAR, and Ultrasonic sensors while using Robot Operating System (ROS)
- Designed and had manufactured a $15,000+ fiberglass cowling using Unigraphics NX to cover the seating area on the tractor
- Modeling various different vehicles such as cranes and combine harvesters and creating simulation environments in ROS

Medical Robotics and Devices Lab - University of Minnesota — Minneapolis, Minnesota
Research Assistant — *January 2016 – May 2019*

- Designed and developed a delta style robot to 3D print on human anatomy while using MATLAB and C++ to control the robot
- Assisted in developing a system that successfully 3D printed onto a moving hand utilizing a UR5 robotic arm and visual feedback
- Helped design and developed a gantry robot system that uses dynamic vision sensors and cameras to track and 3D print on a moving object in real time using ROS

MakerBot Industries — New York City, New York
Mechanical Engineer Intern — *June 2016 – August 2016*

- Designed and optimized an active cooling duct for future generation 3D printers using SolidWorks modeling and simulation capabilities
- Conducted and designed tests to measure torque in several areas of the 3D printer

School of Physics and Astronomy - University of Minnesota Minneapolis, Minnesota
Physics Teaching Assistant *September 2015 – December 2015*

- Facilitated disclosure between 20 students and the instructor while holding office hours to tutor students
- Performed demonstrations during lectures and addressed student conceptual difficulties

SJE Rhombus Detroit Lakes, Minnesota
Manufacturing Engineer Intern *May 2015 - August 2015*

- Designed, improved, and machined various testing adapters used in the facility increasing ease of use and efficiency by 30%
- Conducted cost benefit analysis on $100,000+ selective soldering machines to be implemented in the facility

LEADERSHIP

Engineers Without Borders Minneapolis, Minnesota
Group Leader *August 2015 - May 2017*

- Lead in the design of pressure break tanks, water taps, and water meters using Creo Pro/E
- Designed and implemented a water distribution system for the community of Xiquin Sanahi in Guatemala - Traveled to Guatemala in August of 2015

PROJECTS

Autonomous Differential Drive Robot Fall 2018

- Designed an autonomous differential drive robot that navigates utilizing a Xbox Kinect sensor and constructed it using rapid prototyping techniques
- Used ROS to integrate sensors and communicate with the robot as well as created simulation environments in Gazebo

3D Printing onto Moving Target Spring 2017

- Lead a team in designing a system to 3D print conductive silicone onto a moving object
- Utilized 3D sensors and helped develop algorithms to track the moving object in real time

ACTIVITIES & HONORS

American Society of Mechanical Engineers *Fall 2014 - Present*
National Society of Collegiate Scholars *Spring 2014 – May 2017*
Deans List *Fall 2013 – May 2017*

PUBLICATIONS

Reed A. Johnson, John J. O'Neill, Rodney L. Dockter, Carl J. Modl, and Timothy M. Kowalewski. "Comparison of Bio-Inks for Free-Hand 3D Bioprinting Directly Onto Moving Human Anatomy". The Hamlyn Symposium on Medical Robotics, 2018.

Reed A. Johnson, John J. O'Neill, Rodney L. Dockter, and Timothy M. Kowalewski. "Toward Inkjet Additive Manufacturing Directly onto Human Anatomy". *ASME Journal of Medical Devices*, 2017.

John O'Neill, Reed Johnson, Rodney Dockter, and Timothy Kowalewski. "3d Bioprinting Directly onto Moving Human Anatomy". In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2017.

PRESENTATIONS

Connected and Automated Vehicle Technologies Workshop Lecturer
"Incorporating LIDAR, GNSS, and IMU Sensors for Autonomous Navigation" 2019

Design of Medical Devices Conference Invited Speaker
"Towards Bioprinting onto Human Anatomy" 2017