Alexander Hay

(515) 229-2192 Chicago, IL alexanderhay90@gmail.com

Education

Northwestern University Evanston, IL
M.S. Robotics Expected 2020

Iowa State University Ames, IA
B.S. Mechanical Engineering 2014

Skills

- Coding: MatLab, Python, C, Git, OpenCV,, ROS
- Design: Solidworks, AutoCAD, Inventor
- Relevant Classwork: Neural Control of Movement, Quantitative Methods in Neuroscience, Adv Mechatronics, Machine Learning and AI for Robotics, Biomechanics

Projects **Portfolio:** alexanderhay2020.github.io

Development of an MRI-Compatible Mechatronic Tactile Stimulation Device - Thesis Project
- Built an MRI compatible pneumatic device to stimulate a sensory response at the fingertip
- Embedded software design, modeling and fabrication, characterization and control

Learning Motion Model using Neural Network - ML/AI for Robots
- Implemented a neural network from scratch using gradient descent to generate a motion model of a roomba-like robot exploring its space

Biomimicry using SMA - Winter Project 2020
- Utilized shape memory alloy actuators to mimic the movement of a human elbow joint
- Apparatus used four actuators as analogues to the tricep, bicep, and brachialis muscles

Experience

Pearce Services - Des Moines, IA **Apr 2016 - Aug 2019**
Design Engineer
- Created infrastructure plans for subdivisions, banks, and clinics for construction crews
- Project Management; responsible for defining scope and cost of the project; delegated field engineers
- Teamed with lead and field engineers to deliver on schedule and approved by city/county/state boards

Drive Spotter - Omaha, NE **Jun 2015 - Jan 2016**
Product Engineer
- Developed a working prototype using OpenCV and cascade classifiers to identify traffic signs and zones
- Acted as many roles within a startup company; product development, R&D, project management
- Conducted prior art research; assisted in writing, editing, and revising patents and proposals

Medline Industries - Mundelein, IL **Jan 2015 – May 2015**
R&D Material Technician
- Conducted tests evaluating material properties of medical products for manufacturers
- Constructed new testing procedures in compliance with relevant ISO regulations
- Quantified experimental data using Excel in the final report of quality assurance investigation

Rehabilitation Institute of Chicago - Chicago, IL **Jun 2014 – Sep 2014**
Research Intern
- Worked with a team to develop an adaptive wheelchair controller for spinal cord injury patients
- Implemented a machine learning algorithm to calibrate and integrate IMU data streams
- Used Matlab to analyze the efficacy of the human-computer-interface