MATTHEW WESTBROOK

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EDUCATION

Master of Science | ***Mechanical Engineering - Control Systems*** **(GPA 3.83/4)** August 2018 – September 2020
University of New Hampshire Durham, New Hampshire

Bachelor of Science | ***Mechanical Engineering*** **(GPA 3.23/4)** August 2014 – May 2018
University of New Hampshire Durham, New Hampshire

Computer Science Coursework:
Algorithms, Mobile Robotics, Planning for Robots, Artificial Intelligence, Scientific Programming, Engineering Computing

Electrical Engineering Coursework:
Digital Signal Processing, Non-linear Controls, Robust and Optimal Controls, Advanced Control Systems I/II, Experimental Systems/Analysis, Control Systems and Modelling, Electro-mechanical Systems

PUBLICATIONS

Anytime Kinodynamic Motion Planning using Region-Guided Search October 2020
Matthew Westbrook and Wheeler Ruml
Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)

Shared Control for Mobile Robot Obstacle Avoidance September 2020
Matthew Westbrook
ProQuest

WORK EXPERIENCE

Production Engineer (Full Time) May 2018 – Present
Beswick Engineering Greenland, NH

- Automated packing, shipping, and invoicing using Cybersource, UPS, FedEx, and Google APIs as well as hardware integration.
- Developed production quality test stand software for safe performance validation of high pressure regulators.
- Developed ERP software for sales, applications, and purchasing groups.
- Leveraged knowledge: C++, Python, SQL, LabView, TCP/IP, APIs, XML, Git

Healthcare Specialist (Part Time) June 2012 – June 2018
Army National Guard Milford, NH

- Trained and provided medical care for mountain infantry unit.
- Led a medical team of six people for two of the six years.

Engineering Intern (Full Time) May 2017 – August 2017
GE Aviation Hooksett, NH

- Assisted engineers in developing manufacturing automation software.
- Intern program involved learning business and operations aspects of the company.

PROJECTS AND RESEARCH

UNH Lunacats - Engineering Team Lead/Graduate Student Advisor September 2017 – May 2020
University of New Hampshire

- Built robot to compete in the NASA Robotic Mining Competition (RMC)
- Leveraged knowledge: C++, Python, Electro-mechanical Design, CV, Probabilistic Filtering, Network Communications, Motion Planning, Git

Artificial Intelligence Group September 2018 – September 2020
University of New Hampshire

- Read and contributed to state-of-the-art artificial intelligence algorithms.
- Leveraged knowledge: C++, Python, Matlab, AI

Mechatronics Lab Research September 2018 – September 2020
University of New Hampshire

- Developed swarm navigation algorithms.
- Implemented autonomous control on UAVs and UGVs.
- Leveraged knowledge: Matlab, CV, Robotics, Multi-agent Control, Obstacle Avoidance, Real-time Planning

Artificial Intelligence Final Project February 2019 – May 2019
University of New Hampshire

- Add elements of BIT^* to RRT_x motion planning algorithm for improved time to reach goal.
- Leveraged knowledge: C++, Matlab, Motion Planning, AI, Heuristics, Sampling Based Planning

Mobile Robots Final Project September 2019 – December 2019
University of New Hampshire

- Used computer vision to implement SLAM on Turtlebot.
- Leveraged knowledge: ROS, Python, CV, SLAM, Probabilistic Filtering

Personal Website June 2020 – Present
www.mattwestbrook.com

- Programmed personal website to show research and experience.
- Leveraged knowledge: HTML, CSS, Javascript, React, Git

Coding Competitions/Certification May 2020 – Present
HackerRank and TopCoder

- Certifications and challenges completed on HacerRank: mwestbrook300
- TopCoder competitive SRM rating: 1202 account: mgw10
- Winner of Topcoder NASA Lunar Image Co-Registration Code Challenge

SKILLS

Programming: C/C++, Python (NumPy, SciPy, Matplotlib, Pandas), MATLAB/Simulink, VB, SQL
Computer Science: Algorithms, Data Structures, Motion Planning, Heuristic Search, Scheduling, Sampling-Based Planning, Optimization
Simulation/Rendering: SolidWorks, Blender, Unreal Engine 4
Web: HTML, CSS, Javascript, React, Django, Git, TCP/IP, APIs, XML
Robotics: ROS, Gazebo, Arduino, Micro-Controllers, Raspberry Pi, CV,
Document Creation: Microsoft Office Suite, LaTex, Markdown