Blake McHale

Robotics Software Engineer

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Education

Northeastern University — *Boston, MA*

Candidate for Bachelor and Master of Science in Computer Engineering, GPA: 3.85 — *Expected May 2022*

- **Relevant Courses:** Field Robotics | Mobile Robotics | Artificial Intelligence | Computer Vision | GNSS Signals | Robotics Sensing & Navigation | Machine Learning | Parallel Processing | Computer Systems | Object Oriented Design
- **Activities:** Northeastern Unmanned Aerial Vehicles (Founding Member) | AerospaceNU
- **Awards:** Gorlov Prize for Innovation (1st place capstone project), Honors Program, Eta Kappa Nu, Eagle Scout, Dean's Scholarship, Dean's List, NASA International Space Apps Challenge Boston (1st place)

Experience

NASA Jet Propulsion Laboratory — *Pasadena, CA*

Software Engineering Co-op | C, C++, Python — *Jan. 2021 - June 2021*

- Worked on Surface Simulation (Ssim), used by rover planners for validating command sequences on the Mars rover
- Improved current Ssim project by adding support for more features related to terrain processing
- Extended web interface to Ssim using Robot Framework

MITRE — *Bedford, MA*

PNT Platform Software Intern | Python — *June 2020 - Aug. 2020*

- Added continuous integration and online documentation for signal propagation simulation python package
- Implemented path loss models that utilized terrain maps and supported various positioning methods

Naval Submarine Medical Research Laboratory — *Groton, CT*

NREIP Software Intern | Python — *June 2019 - Aug. 2019*

- Worked on using machine learning to predict reaction time in sleep deprived individuals
- Utilized TensorFlow to construct a neural network framework for analyzing model performance

Scientific Systems Company Incorporated — *Woburn, MA*

Simulations Engineering Co-op (Active Perception Group) | C++, Python, Javascript — *Jan. 2019 - June 2019*

- Designed software for simulating UAVs actions with AirSim and added artificially intelligent characters to Unreal Engine
- Developed control systems for multiple UAVs/UGVs in Gazebo as part of DARPA Subterranean Challenge

Skills

Computer Applications ROS/ROS2, Gazebo, Ignition, PX4/RTPS, Unreal Engine, Unity

Languages C++, Python, MATLAB, Java, Javascript | Familar with VBA, HTML, CSS, SQL, C#

Projects

ME4702 - Capstone Project - Swarm Carrier

Software Lead | C++, Python — *July 2021 - Dec. 2021*

- Designed and field tested platform for transporting three UAVs with a large octocopter Carrier Drone
- ROS2 and PX4/RTPS architecture for aerial deployment of UAVs and autonomous catching during free fall
- Controller for reintregating deployed UAVs back into Carrier Drone with OpenCV ArUco markers landing

AerospaceNU - NUAV Software

Project Lead | C++, Python — *June 2019 - Present*

- Created behavior tree library for performing missions with ROS
- Teach new members and students how to use ROS/ROS2 to control rover and drone autonomously with PX4
- Competed in AlphaPilot competiton to autonomously race drones using YOLO

CS4100 - Deep Flight

Python — *Sept. 2020 - Dec. 2020*

- Created double DQN to train UAV to fly through obstacle course using depth images
- Designed reinforcement learning environment in AirSim with OpenAI Gym and TensorFlow