Andrew **Torgesen**

Roboticist · Mechanical Engineer · Computer Scientist

60 Wadsworth St, Apt 12F, Cambridge, MA 02142

(661) 210-5214 | andrew.torgesen@gmail.com | andrewtorgesen.com | goromal | andrew-j-torgesen

Education

Massachusetts Institute of Technology
Cambridge, MA

M.S. in Aeronautics and Astronautics, Autonomy Emphasis

September 2019 - Present

Brigham Young University
Provo, UT

B.S. in Mechanical Engineering

September 2012 - April 2019

- Graduated with *Magna Cum Laude* honors.
- Computer Science and Mathematics Minors.

Work Experience

Aerospace Controls Lab
Cambridge, MA

Graduate Research Assistant

September 2019 - Present

- In charge of designing, implementing, and testing a tethered unmanned aircraft system that characterizes the airflow behind naval ships.
- Designed and implemented a quadrotor control scheme for tethered flight in simulation and hardware.
- Designed and implemented an error-state Kalman Filter for quadrotor state estimation.

Raytheon
Tucson, AZ

Guidance, Navigation, and Control Engineer

May 2019 - August 2019

- Implemented and integrated a new gun drive system model into an autonomous track-and-fire defense simulation written in Ada and C.
- Conducted two in-depth trade studies evaluating the effectiveness of the gun drive compared to a baseline, automating several testing procedures in the process for increased efficiency.
- Used debugging and engineering analysis of simulation results to pinpoint several disparities between the simulation and the physical system.

Magicc Lab
Provo, UT

Research Assistant

April 2017 - April 2019

- Designed and implemented a factor graph back-end optimizer that calculates the 6-DOF offsets between a camera sensor and an IMU.
- Created a high-fidelity dynamic simulation of an autonomous multirotor in C++ for flying waypoints, taking inertial and visual measurements, and landing on a boat.
- Worked with hardware on a multirotor for field testing of a camera offset optimization routine.

Air Force Research Laboratories
Albuquerque, NM

Robotics Developer

May 2018 - August 2018

- Designed and implemented a well-documented real-time simulation of a 7-DOF robot arm to match the behavior of a real robotic arm.
- Researched and implemented an inverse kinematic path planner for the control of a robotic arm.
- Designed and implemented an estimation scheme using an Extended Kalman Filter to localize objects without motion capture.

Project Experience

Autonomous UAV Team
Provo, UT

Brigham Young University

September 2018 - June 2019

- Captain of team of 12 undergraduate seniors in Mechanical, Electrical, and Computer Engineering for the international AUVSI-SUAS competition.
- Used agile project management tools to coordinate and evaluate efforts of controls, computer vision, unmanned ground vehicle, and airframe sub-teams.
- Designed and built a versatile ground station GUI for interfacing with an autonomous UAV.
- Led flight testing and tuning of lateral and longitudinal autopilot, implementing supporting path following and state estimation algorithms.
- Devised and created integrated and systematic documentation system built on LaTeX which all team members used.

Skills & Coursework

Technologies
- Modern C++, Python
- Matlab
- Git, Linux, Bash
- ROS, Gazebo
- Technical Communication

Concepts
- Autopilot Design
- Control Systems Design
- State Estimation
- Modeling and Simulation
- Optimization, Factor Graphs

Coursework Sample
- Robust Control
- Optimization
- Flight Dynamics and Control
- Dynamic Optimization and Control
- Principles of Autonomy and Decision Making