

Brendon Forsgren

345 Okaloosa Road NE, Fort Walton Beach, Florida 32548, USA
bforsgren29@gmail.com • +1 (585) 315-3979 •
[LinkedIn Profile](#)

EDUCATION

Brigham Young University, Provo, Utah, USA

- PhD candidate in Mechanical Engineering (5th year) Expected Aug 2023
 - Graduate GPA: 3.93/4.0
- B.S. in Mechanical Engineering Apr 2018
 - Cumulative GPA: 3.86/4.0

EXPERIENCE

Brigham Young University, Provo, Utah, USA

- Graduate Research Assistant, BYU MAGICC Lab Apr 2018– Present
 - Research in cooperative GPS-denied navigation
 - Robust outlier detection in high outlier regimes
 - Robust pose graph optimization techniques

Air Force Research Laboratory, Munitions Directorate, Eglin Air Force Base, FL

- NSF-AFRL Graduate Research Intern Oct 2022 – Present
 - Implementing a MSCKF for accurate GPS-denied navigation of high flying vehicles
 - Team lead role in preparation for real-time flight test of MSCKF
 - Developing a novel cooperative navigation framework
- AFRL Scholars Intern, Secret Security Clearance Jun 2021– Aug 2021
 - Implemented a cooperative pose graph optimization algorithm
 - Demonstrated cooperative pose graph optimization algorithm in a real-time hardware demonstration

Near Earth Autonomy, Pittsburgh, PA, USA

- Robotics Engineering Intern May 2019 – Aug 2019
 - IMU evaluation for GPS enabled missions
 - Integrated external IMU system with existing hardware in several autonomous flights
 - Evaluation of IMU noise characteristics
 - Wrote post processing scripts to evaluate performance

SKILLS

Computer Programming

- Languages: C++, Python, Matlab
- Familiarity with OpenCV, ROS, and Eigen libraries

Computer Vision

- Used stereo vision to track and catch a baseball traveling at 40mph
- Implemented a tightly-coupled visual inertial odometry algorithm
- Demonstrated a lane following algorithm on a small scale self-driving car
- Developed optical flow and visual servoing controllers on a quadrotor in simulation

State Estimation

- Familiar with Kalman filters, Particle filter, and SLAM algorithms
- Familiarity with factor graphs
- Implemented a Moving Horizon Estimator in real time on Turtlebot data
- Familiarity with Ceres and GTSAM software libraries
- Developed a UAV flight simulator in ROS using Python and C++

PUBLICATIONS

- *Direct Relative Edge Optimization, a Robust Alternative for Pose Graph Optimization*, IEEE Robotics and Automation Letters, 2019
- *Group- k Consistent Measurement Set Maximization for Robust Outlier Detection*, IEEE IROS 2022

- *Incremental cycle bases for cycle-based pose graph optimization*, IEEE Robotics and Automation Letters, 2023