Kristen Michaelson, Ph.D.

San Francisco, CA • kristen.michaelson@gmail.com • LinkedIn • Google Scholar

EDUCATION

Ph.D. Aerospace Engineering, The University of Texas at Austin December 2024

Dissertation: *Recursive Measurement Updates for Particle and Ensemble Filtering*

- Studied the optimality of multiple data assimilation (MDA), a popular sensor fusion technique for particle/ensemble filters, and proposed novel adaptive/continuous MDA schemes
- Designed simulation studies to test the new filters, demonstrating improved accuracy over baseline methods in applications such as radar-based cislunar tracking and tracking large-scale chaotic systems

M.S.E. Aerospace Engineering, The University of Texas at Austin December 2020

- Implemented a simultaneous localization and mapping (SLAM) algorithm, the multi-state constraint Kalman filter (MSCKF), with a multiplicative quaternion (attitude) update in a simulated camera/IMU system

B.Sc. Mechanical Engineering, Brown University May 2016

SELECTED ROBOTICS & AUTONOMOUS NAVIGATION EXPERIENCE

The University of Texas at Austin, Dept. of Aerospace Engineering & Engineering Mechanics, Austin, TX

Postdoctoral Fellow, Graduate Research Assistant 2018—2025

- Developed an information-based cost metric for rapidly-exploring random trees (RRT*); the metric induces navigation-friendly behaviors by drawing agents into regions where informative measurements are available

Teaching Assistant (Aerial Robotics, Introduction to Computer Programming) 2021 & 2022

- Facilitated annual Aerial Robotics course tournament in which student teams program quadcopters to complete an obstacle course; mentored students through development of full autonomy stack (MATLAB / C++ / ROS) including state estimation, guidance, path planning; received overall "Excellent" TA rating of 5.0/5.0

Sandia National Laboratories, Albuquerque, NM

Summer Intern, Technical Internships to Advance National Security (TITANS)/AutonomyNM 2019 & 2022

- Designed and implemented a navigation filter for a neuromorphic terrain-relative navigation technique ("NeuroGrid") under development in the Sandia Center for Computing Research (LiDAR/IMU)

Vecna Technologies, Inc., Cambridge, MA | *Summer Intern, Product Development* 2015

- Designed and constructed a pressure sensor calibration system for hydraulic-powered robotic actuators, supporting adoption of low-cost components in hydraulic systems

PROFESSIONAL EXPERIENCE

Saint-Gobain Performance Plastics, Wayne, NJ | *R&D Engineer* 2016—2018

- Carried out standard laboratory testing for automotive bearings including journal bearing testing, Instron testing, and corrosion/environmental testing; designed application-specific test fixtures and procedures
- Presented test results to internal and external customers, including quality engineering, sales, and global R&D

SELECTED PUBLICATIONS

- **K. Michaelson**, M. Gandhi, and R. Zanetti. "Navigation-Aware Path Planning and Multi-Agent Coordination in Challenging Environments." ION PLANS, Salt Lake City, UT. April 28—May 1, 2025.
- **K. Michaelson**, A. Popov, R. Zanetti, and K. J. DeMars. "Particle Flow with a Continuous Formulation of the Nonlinear Measurement Update." 27th Intl. Conf. on Information Fusion, Venice, Italy. July 7—11, 2024.
- **K. Michaelson**, F. Wang, and R. Zanetti. "Terrain-Relative Navigation with Neuro-Inspired Elevation Encoding. IEEE Transactions on Aerospace & Electronic Systems. June 2024.

SKILLS & INTERESTS

- ***Software development:*** proficient in Python, MATLAB; some experience with C++, Git, ROS, Java, Julia
- ***Selected coursework:*** Intro/Advanced Statistical Estimation Theory (EKF/UKF), Neural Networks and Deep Learning (Coursera), Modeling Multi-Agent Systems, Autonomous Robots, Orbital Debris, Optimal Control
- ***Additional skills and interests:*** public speaking, science & technology policy, safety & sustainability, crosswording