

SAMUEL M. BATEMAN

saba6857@colorado.edu

EDUCATION

University of Colorado - Boulder

May 2020

B.S. in Computer Science

B.S. in Applied Mathematics

Overall GPA: 3.64

PUBLICATIONS

S. Bateman, K. Harlow and C. Heckman, Learning Class-Based Survival Priors Online for Probabilistic Dynamic SLAM, Conference on Robotic Learning 2020, In Progress.

- Developing a Automatic Survival Function Prior generator based on Long Term Object Tracking and Reidentification.
- Implemented a robust, real-time Multi-Object Tracking system in C++ utilizing sensor inputs from Lidars and Cameras which is then executed over Oxford Robot Car dataset to sample real world data to generate priors.

S. Bateman, K. Harlow and C. Heckman, Better Together: Online Probabilistic Clique Change Detection in 3D Landmark-Based Maps, International Conference on Intelligent Robots and Systems 2020. Submitted.

- Developed a novel Joint Clique-Based Landmark Persistence Filter for culling semi-static and dynamic landmarks from a map used for Localization, moving towards a true Semantic, Dynamic, Probabilistic SLAM.
- Developed a 3D sensor simulation to compare performance of the Joint Clique Filter against previous developed persistence filters.

T. Teil. **S. Bateman** and H. Schaub, Autonomous On-Orbit Optical Navigation Techniques for Robust Pose-Estimation, AAS Guidance, Navigation and Control Conference, Breckenridge, CO, Jan. 30 - Feb. 5 2020.

- Developed a novel Orbiting Body Limb Detection Convolutional Neural Network which outperformed the previous SoTA for Autonomous Optical Navigation for Spacecraft in high fidelity simulations.
- Developed new Data Augmentation techniques specific to the necessities of OpNav and Spacecraft Imagery.

T. Teil, **S. Bateman** and H. Schaub, Software Architecture for Closed-Loop Optical Spacecraft Navigation and Control Development, *AAS Journal of Astronautical Sciences*. In-Press.

- Developed a Realtime Pipeline for Visual Simulation of Spacecraft Cameras in conjunction with the Basilisk Astrodynamics Framework.
- Helped introduce a first pass for Open Source Autonomous, On-Orbit Optical Navigation Simulation using the Basilisk Framework.

PROFESSIONAL EXPERIENCE

Autonomous Vehicle Lab - Aerospace Engineering - CU Boulder Aug 2018 - Present
Research Assistant Boulder, CO

- Develop much of the Optical Sensors and Navigation capabilities of the High-Fidelity Astrodynamics Framework, Basilisk, as a Python extension written in C++.
- Work closely with a PhD Student to perform novel research in the field of Astrodynamics.

Massachusetts Institute of Technology - Lincoln Laboratory May 2019 - Aug 2019
Summer Research Intern Boston, MA

- Performed research on Unsupervised Deep Learning.
- Worked with a interdisciplinary team in the Humanitarian Aid and Disaster Relief Systems group.

Polycom May 2018 - Aug 2018
Software Engineering Intern Westminster, CO

- Developed a customer facing, large scale web product utilizing Java for backend APIs and Modern Javascript Frameworks for the front end.
- Developed a unique, legacy compatible, system design to fix up and improve a existing system.
- Worked with two other interns and a one full time staff to lead a large team of international engineers in building this system.

Office of Information Technology - CU Boulder Sept 2017 - May 2018
Desktop Support Technician Boulder, CO

- Worked to troubleshoot general computer problems while working directly reassuring often nervous and stressed customers.

Department of Computer Science - CU Boulder Sept 2017 - Dec 2017
Computer Systems Course Assistant Boulder, CO

- Held office hours for the Computer Systems course in the Computer Science Department with topics including: Virtual Memory, System Interrupts, Buffer Overflow Attacks, Return-Oriented Programming, Pipelining, Caching, Instruction-Level Parallelism, Assembly Programming, Computer Architecture and more.

HONORS

CU Engineering Merit Scholarship, 2019-2020
Dean's List, Spring 2018-Present

RELEVANT COURSES

Robotics Courses	Computer Vision, Autonomous Vehicle Challenge Seminar, Advanced Robotics, Introduction to Robotics
Applicable CS Courses	Mathematics of Cryptosystems, Software Development and Tools, Computational Biology, Data Structures, Algorithms, Operating Systems, Programming Languages and Interpreters, Human-Computer Interaction
Applicable Math Courses	Operations Research, Applied Probability, Markov Processes, Numerical Analysis, Discrete Mathematics, Applied Linear Algebra, Multivariable Calculus, Differential Equations, PDEs, Multivariate Analysis, Complex Analysis