Oliver Broadrick

Website: oliverbroadrick.com
Email: odbroadrick@gmail.com
Phone: 207 351 5208
Address: 2400 M St NW Apt 516, Washington DC 20037

Education

2023 (expected) M.S. Computer Science (4.00 GPA) — The George Washington University

2022 B.S. Computer Science and Mathematics (3.77 GPA) — The George Washington University

4-year rower for GW Men's Rowing achieving top ten national finishes (team's highest ever)

Research

Keen to explore, I've done research in security, systems, and computer vision.

Single image camera calibration with glitter (2022-present)

Camera calibration – estimation of camera pose and intrinsic properties like focal length – is a classic problem in computer vision with traditional methods requiring dozens of images for high accuracy. Using the strong geometric constraints provided by sparkling glitter, we are developing single image camera calibration.

Post-election statistical audits (2020-present)

In a Risk-Limiting Audit (RLA), a random sample of paper ballots and a rigorous statistical test are used to guarantee with known probability that incorrect election results will be detected and corrected. Among other work, I have developed Providence a novel mathematical method for ballot polling RLAs, the most efficient and secure RLA of its kind.

Scheduling for real-time AI at the edge (2021-2022)

I designed and analyzed scheduling algorithms with the imprecise computation model for real-time AI tasks at the edge.

Teaching

Undergraduate Teaching Assistant (2021-Present)

Taught weekly discussion section, assisted in lectures, hosted office hours, with consistent, positive feedback from students and high attendance to office hours.

Foundations of Computing, Spring 2022
Discrete Structures II, Fall 2021

Learning Assistant (2020-2021)

Assisted in lectures and discussions, recorded supplemental lectures, hosted office hours.
Foundations of Computing, Spring 2021
Discrete Structures II, Fall 2020
Discrete Structures I, Spring 2020

Tutor (2016-Present)

Tutored dozens of high school and college students for hundreds of hours, one-on-one and in groups, mainly in mathematics, physics, and computer science, in various settings:
GW Navy ROTC Calculus and Physics Tutor (2022-Present)
Tungsten Prep (2018-Present)
GW Athletics Department (2018-2020)
High school peer tutoring program at Berwick Academy (2016-2018)

Honors and awards

2022, Member, Pi Mu Epsilon Mathematics Honorary Society

2019-2022, Dean's List

2021, Summer Undergraduate Program in Engineering Research (SUPER)

2020, Summer Undergraduate Program in Engineering Research (SUPER)

Actions towards diversity and inclusivity

2022, JEDI Committee Member (among six founding members)

2022, Co-author of *Student Proposal: Diversity and Inclusion in the Computer Science Department*

Publications

In Preparation

1. (With Poorvi L. Vora and Filip Zagòrski) "*Providence*: a flexible round-by-round audit". In preparation.
2. (With Robert Pless and Adellar Irankunda) "Single-image camera calibration with glitter". In Preparation.

In Review

1. Hesham Fouad, Oliver Broadrick, Benjamin Harvey, Charles Peeke, Bhagirath Narahari, "Real-Time AI: Using AI on the Tactical Edge." In *Putting AI in the Critical Loop: Assured Trust and Autonomy in Human-Machine Teams*. Elsevier, 2023.

Accepted

1. Oliver Broadrick, Sarah Morin, Grant McClearn, Neal McBurnett, Poorvi L. Vora and Filip Zagòrski, "Simulations of Ballot Polling Risk-Limiting Audits". Seventh Workshop on Advances in Secure Electronic Voting, in association with Financial Cryptography 2022.