Brantley Vose

Curriculum Vitae

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prismika.github.io/

Education

2020–Present **PhD in Mathematics**, *The Ohio State University*, Advised by Dustin Mixon. Expected graduation spring 2026.

2020–2022 **Master of Mathematics**, *The Ohio State University*.

2016–2020 **Bachelor of Computer Science and Mathematics**, *Iowa State University*, *3.97 GPA*.

2014–2016 **Associate of Science**, *Indian Hills Community College*, *3.954 GPA*.

Current Research

2023 – Present **Symmetry in Data Analysis**.
Developing computational methods for detecting and exploiting approximate symmetries in data analysis tasks.

2024 – Present **Invariant and Stable Vectorizations**.
Producing vectorization methods that are both stable and expressive, as well as invariant to some group of ambiguities.

Experience

June 2025 – Aug 2025 **Summer Research Fellow**, *Data and Democracy Lab at Cornell*, Ithaca, NY.
- Collaborated with research teams on democracy-related mathematical problems.
- Contributed to open source Python package.

Aug 2021 – Dec 2024 **Graduate Teaching Associate**, *The Ohio State University*, Columbus, OH.
- Teach recitation sections for 60 students, supplementing lectures by presenting examples.
- Assist students through feedback, office hours, and tutoring hours.

May 2023 – July 2023 **Data Science Intern**, *Mined XAI*, Dayton, OH.
- Collaborated with a team to develop novel applications of in-house data analysis pipelines.
- Crafted visualizations to present results to the wider company.

June 2022 – Aug 2022 **Summer Counselor**, *Ross Mathematics Program*, Columbus, OH.
- Mentored four high school students through a summer-long mathematics camp.
- Tracked student progress and delivered detailed feedback in one-on-one sessions.

May 2020 – July 2020 **Data Engineering Intern**, *Collins Aerospace*, Cedar Rapids, IA.
- Contributed to team of data engineers.
- Developed and maintained automated Python web scrapers.
- Interfaced with Amazon Web Services.
- Operated and configured Linux servers on the cloud.

June 2019 – Aug 2019 **Cybersecurity Intern**, *Patuxent River Naval Air Base*, Patuxent River, MD.
- Learned all relevant cybersecurity knowledge on the job.
- Created and oversaw training event for 30 Cyber Test and Evaluation branch members and contractors.
- Established and operated network of virtual Linux servers.
- Coached clients and colleagues on cybersecurity tools and concepts.

Publications

Estimating the Euclidean distortion of an orbit space, *with Ben Blum-Smith, Harm Derksen, Dustin Mixon, and Yousef Qaddura*, Submitted to *Forum of Mathematics, Sigma*.

Recovering a group from few orbits, *with Dustin Mixon*, Accepted pending revisions in *Applied and Computational Harmonic Analysis*.

Geometry and stability of supervised learning problems, *with Facundo Mémoli and Robert C. Williamson*, To appear in *Journal of Machine Learning Research*.

Harmonic representatives in homology over arbitrary fields, *with Michael Catanzaro*, Published in *Journal of Applied and Computational Topology*, 2023.

Presentations

Oct 2024 **Poster: How Many Orbits Determine the Group?**, *Fall Fourier Talks*, Norbert Wiener Center for Harmonic Analysis and Applications, College Park, Maryland.

July 2024 **A Space of Supervised Learning Problems**, *Foundations of Machine Learning Systems Research Seminar*, Tübingen AI Center, Tübingen, Germany.

April 2024 **Estimating Migration Systems Using Markov Chain Coarse-Graining**, *Population Association of America Annual Meeting*, Columbus, Ohio.

April 2024 **String Diagrams for the Working Mathematician**, *Math Graduate Student Seminar*, Ohio State, Columbus, Ohio.

March 2024 **A Space of Supervised Learning Problems**, *Topology, Geometry, and Data Analysis Seminar*, Ohio State, Columbus, Ohio.

Feb 2024 **Harmonic Representatives for Homology over Finite Fields**, *UF–TDA Seminar*, University of Florida, Gainesville, Florida.

June 2023 **Harmonic Representatives for Homology over Finite Fields**, *Geometry and Topology Meet Data Analysis and Machine Learning*, Northeastern University, Boston, Massachusetts.

March 2023 **Making Sense of Network Data with the Hodge Decomposition**, *Topology, Geometry, and Applications Graduate Seminar*, Columbus, Ohio.

Apr 2018 **Additively Irreducible Metrics**, *Midwest Undergraduate Mathematics Symposium*, Simpson College, Indianola, Iowa.

Skills

Languages Python, exposure to Java, C++, C, R, and SQL

Tools and Platforms Git, Debian Linux, Bash, LaTeX, PyTorch

Awards

Nov 2024 Ohio State Phil Huneke Excellence in Teaching Award Finalist

Aug 2023 Rhodus Graduate Fellowship from The Ohio State University Department of Mathematics

Aug 2020 Distinguished University Fellowship from The Ohio State University Graduate School

May 2018 Fred Wright Mathematics Endowed Scholarship

Links

Website `https://prismika.github.io/`

Blog `https://brantleyfightsfunctors.blogspot.com/`