Brantley Vose

Curriculum Vitae

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🖆 prismika.github.io/

Education

2020–Present	**PhD in Mathematics**, *The Ohio State University*.
2020–2022	**Master's in Mathematics**, *The Ohio State University*.
2016–2020	**Bachelor of Mathematics and Computer Science**, *Iowa State University*, *3.97 GPA*.
2014–2016	**Associate of Science**, *Indian Hills Community College*, *3.954 GPA*.

Current Research

2023 – Present — **Symmetry Detection in Point Cloud Data**, *The Ohio State University*, With Dustin Mixon.

Developing computational methods for approximating the symmetry group of point cloud data in the presence of noise.

2022 – Present — **Optimal Transport and the Space of Supervised Learning Problems**, *The Ohio State University*, With Facundo Mémoli.

Constructing an optimal-transport-based metric on the collection of supervised learning problems and exploring the resulting metric space.

Experience

Aug 2021 – Present — **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 2020 – July 2020 — **AI Data Engineering Intern**, *Collins Aerospace*, Cedar Rapids, IA.
- Contributed to team of data engineers.
- Developed and maintain automated Python web scrapers.
- Interfaced with Amazon Web Services.
- Operated and configured Linux servers on the cloud.

Aug 2018 – Dec 2019 — **Undergraduate Teaching Assistant**, *Iowa State University Mathematics Department*, Ames, IA.
- Mentor and facilitate discussion with small groups of incoming mathematics majors.
- Collaborate with team to maintain 92% retention rate of math majors from their first to second years in college.

June 2019 – Aug 2019 — **Cybersecurity Summer 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.

Presentations

March 2023   **Making Sense of Network Data with the Hodge Decomposition**, *Topology, Geometry, and Applications Graduate Seminar*, Ohio State.
Introduced the discrete Hodge decomposition and explored applications to network data.

August 2023   **Metric Geometry in Supervised Learning**, *Oral Candidacy Exam*, Ohio State.
Provided background on concepts from optimal transport and metric geometry. Motivated and described their adaptation to the setting of supervised learning problems. Presented preliminary results and future work.

February 2022   **The Importance of Forgetting**, *Graduate Topics Course: Topological Data Analysis in Neuroscience*, Ohio State.
Presented the paper *The Importance of Forgetting: Limiting Memory Improves Recovery of Topological Characteristics from Neural Data* by Chowdhury, Dai, and Mémoli.

March 2020   **Detecting Geometric Structure in the Brain with Topology**, *Graduate Topics Course: Random Graphs and Cell Complexes*, Ohio State.
Presented the paper *Clique Topology Reveals Intrinsic Geometric Structure in Neural Correlations* by Giusti, Pastalkova, Curto, and Itskov.

May 2019   **Undergraduate Thesis Defense**, *Iowa State Undergraduate Committee Meeting*, Iowa State University.
Presented undergraduate thesis results to Iowa State Undergraduate committee.

Apr 2018   **Additively Irreducible Metrics**, *Midwest Undergraduate Mathematics Symposium*, Simpson College.
Gave talk on undergraduate thesis work to audience of 20-30 undergraduates.

Skills

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

Tools and Platforms   Git, Debian Linux, Bash, LaTeX, Arduino, Jupyter Notebook, some Android Studio

Awards

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

May 2018   Fred Wright Mathematics Endowed Scholarship

Projects

Arduino Musical Gloves.
Equipped two gloves with Arduino clones, accelerometers and gyroscopes to act as an electronic instrument.

Raspberry Pi Linux Server for File Backups.
Configured Raspberry Pi to act as a Linux server to automatically sync files from laptop across home network.

Dijkstra's Curse, Single Player Game in C/C++.
Built simple randomly generated dungeon crawling game with ASCII graphics, items, and smart enemies.
`https://github.com/prismika/Dijkstra-s-Curse`

Links

Github   `https://github.com/prismika`