

AIDAN LORENZ

(215) 837-6589 • aidanlorenz@gmail.com • [linkedin.com/in/aidan-lorenz](https://www.linkedin.com/in/aidan-lorenz) • github.com/aidanlorenz • aidanlorenz.github.io

TECHNICAL SKILLS

Languages: Python, R, SQL, Java • **Additional Software:** Git, PyTorch, scikit-learn, NumPy, pandas, Anaconda, RStudio, Matlab, LaTeX, Mathematica

EDUCATION

PhD in Mathematics, *Vanderbilt University* (3.94 GPA) 2019 – May 2024 (Expected)
Dissertation topics: Geometric group theory, low dimensional topology.

Selected courses: Mathematical Data Science • Data Structures • Database Management Systems • Machine Learning • Optimization

Master's in Mathematics, *Vanderbilt University* 2023

Honors Bachelor of Science, Mathematics & Physics, Certificate in Programming, *Temple University* 2015 – 2019

Awards: Sholomskas Award for Outstanding Students (Mathematics) • Robert A. Figlin Family Research Award • Most Promising Mathematics Major Award • President's (full tuition merit) Scholarship • Science Scholars Program • Magna Cum Laude • Phi Beta Kappa • Dean's List

DATA SCIENCE EXPERIENCE

Independent Project, Generative AI in Robotics

In Progress December 2023 – Present

- Experimenting with methods of incorporating generative AI (variational autoencoders in PyTorch) to improve upon current standards of sampling-based motion planning in robotics.

Participant, Data Science Bootcamp

September – December 2023

Erdős Institute

- Developed a beer recommendation system with a group of 4 using matrix factorization optimizing across 3 different loss functions.
- Won "with distinction" honors in project competition.
- Completed comprehensive semester-long course on Machine Learning techniques.

Participant, Math to Industry Bootcamp

June – July 2023

University of Minnesota, Institute for Mathematics and its Applications

- Collaborated with a group of 7 at Pacific Northwest National Laboratory on research style projects assessing robustness of generative AI deep learning models (Meta's Segment Anything Model, GPT-2, Bloom, Pythia, and other large language models).
- Utilized semantic text embedding algorithms (via Hugging Face) as well as standard computer vision and natural language processing metrics in our assessment.

RESEARCH EXPERIENCE

Doctoral Mathematics Researcher

2019 – Present

Vanderbilt University, Department of Mathematics

- Built package integrating Python, Sage, Regina, and Mathematica to work with small dilatation pseudo-Anosov homeomorphisms using Veering triangulations to detect provable results.
- Solved open problems related to dynamics and symmetries of surfaces.
- Attended 7 conferences and delivered 11 invited academic talks developing both technical and non-technical communication skills.

Undergraduate Research Assistant, Mathematics

2017 – 2019

Temple & Cornell Universities, Departments of Mathematics

- Designed programs in Python and GAP to carry out group-theoretic computations leading to 2 publications.
- Won Honorable Mention at the Undergraduate Research Symposium Poster Session.

LEADERSHIP EXPERIENCE

Instructor of Record

2020 – December 2023

Vanderbilt University, Department of Mathematics

- Taught as Instructor of Record for 3 courses including Statistics Lab in R and served as TA for 5 calculus courses.
- Won the B.F. Bryant Prize for Excellence in Teaching based on exemplary student reviews: across all years, reviews were 11% better than the math department average and 6% better than the College of Arts and Science average.
- Earned optional Certificate in College Teaching.

PUBLICATIONS **Authors listed in alphabetical order*

- [What are GT-shadows?](#), Vasily Dolgushev, Khanh Le, Aidan Lorenz, **Algebraic & Geometric Topology** (2023)
- [On the replacement property for \$PSL\(2, p\)\$](#) , David Cueto Noval, Aidan Lorenz, Baran Zadeoglu, **Communications in Algebra** (2021)