

Alexander Berliner

CONTACT

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EDUCATION

University of Arizona, Tucson, AZ
PhD in Statistics & Data Science

August 2022 – May 2027 (expected)

University of Arizona, Tucson, AZ
MSc in Statistics & Data Science

August 2022 - Dec. 2024

College of William & Mary, Williamsburg, VA
BSc in Mathematics, Applied Mathematics Concentration
Minor in Computer Science

August 2018 - May 2022

PUBLICATIONS

1. Berliner, Alexander, "Period Doubling Cascades from Data" (2022). *Undergraduate Honors Theses*. William & Mary. Paper 1847

RESEARCH EXPERIENCE

University of Arizona, Department of Statistics & Data Science

Graduate research assistant, February 2025 – present

Advisor: Henry Scharf

Project: Implementing SDE-based animal movement models using particle filters to shed light on how animals interact with each other and how they respond to environmental changes resulting in human activity. Assessing the effectiveness of various particle filter techniques for fitting more realistic models involving non-linearities and/or non-Gaussianity.

University of Arizona, Department of Aerospace & Mechanical Engineering

Graduate research assistant, January 2024 – December 2024

Advisor: Samy Missoum

Project: Developed a multidimensional Gaussian Process regression (GPR) surrogate model from scratch. Experimented with multi- versus individual- response GPRs on sparse data, progressively increasing the dimensionality of the problem. Investigated optimum designs of experiments with Bayesian adaptive sampling techniques.

Output: Written report. Delivered weekly lecture presentations to technical audience.

College of William & Mary, Department of Mathematics

Honors senior thesis research, June 2021 – May 2022

Advisor: Sarah Day (College of William & Mary). Co-advisor: William Kalies (Florida Atlantic University)

Project: Studied period doubling cascades from models and from data. Investigated whether a Gaussian Process can be used to reconstruct a system, like the logistic map, from data through asymptotic dynamics in the orbit diagrams for period doubling cascades.

Output: Published senior thesis, written report, 4 lectures, 3 poster presentations (various audience levels)

College of William & Mary, Department of Physics

Undergraduate research assistant, January 2020 – May 2020

Advisor: Seth Aubin

Project: Dedicated 5 hours per week to developing an improved user interface for a webpage in control of data input/output communication between the lab's main computer and the lab's electronics.

TEACHING EXPERIENCE

University of Arizona

Graduate teaching assistant, August 2022 – July 2025

Assisted undergraduate students in college algebra, introductory biostatistics, and introduction to data science. Provided office hours, grading homework, and proctoring exams. Head TA for online biostats course.

PRESENTATIONS

1. Richmond Area Mathematical Sciences Conference, Virginia Commonwealth University, April 2022. *Period Doubling Cascades from Data* (lecture)
2. Undergraduate Research Month, College of William and Mary, April 2022. *Period Doubling Cascades from Data* (poster)
3. AMS-PME Undergraduate Poster Session, Virtual Joint Mathematics Meetings (JMM), April 2022. *Period Doubling Cascades from Models and from Data* (poster)
4. Biomath Journal Club, College of William and Mary, April 2022. *A Model Free Approach to Population Dynamics* (lecture)
5. SUMS Conference, Brown University, March 2022. *Period Doubling Cascades from Models and from Data* (lecture)
6. SUMS Conference, James Madison University, December 2021. *Period Doubling Cascades from Models and from Data* (poster)
7. Summer Honors Fellowship, College of William and Mary, August 2021. *Analysis of the Orbit Diagram from a Finite Time Series* (lecture)
8. Research Symposium, Northern Virginia Community College, May 2018. *The electrical, thermal, and mechanical properties of graphene with analysis on possible technological applications* (poster)

PROJECTS

1. Developed a program to create a maze with the longest path, greatest number of dead-ends, and largest search space for search algorithms like depth-first, uniform cost, greedy best, and A*.

HONORS AND AWARDS

- Graduated with honors, *magna cum laude*, College of William & Mary, 2022.
- William & Mary's Dean's list Fall 2018, Spring 2019, Spring 2020, Fall 2020, Fall 2021, Spring 2022
- Member of Phi Mu Epsilon (National Mathematics Honors Society). 2021-2022.
- 2022 Virginia Commonwealth University RAMS Conference – *Best presentation award* for my talk on "Period Doubling Cascades from Models and from Data"
- Charles Center *Honors fellowship* to undertake research on a topic in applied mathematics in preparation for senior thesis. Summer 2021.

RELEVANT MEMBERSHIP

- Statistics & Data Science Journal Club. University of Arizona. 2025 -
- Mathematics Club. College of William & Mary. 2018 - 2022

TECHNICAL SKILLS

- *Programming*: Python (also Pandas, Numpy, Scipy, Scikit-learn, GPy, Matplotlib, TF Keras), R, SAS
- *Supervised, unsupervised, and reinforcement learning algorithms*
- *Neural networks*: feed-forward (scratch, Keras), recurrent, convolutional, transformer (TF Keras)
- *Data organization*: Excel, Google Sheets.
- *Mathematical*: statistical inference, problem solving, communication, high-dimensional data analysis, optimization, time series forecasting, LaTeX

LANGUAGES

Croatian (fluent)

Russian (conversational)