Alexander Berliner

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CONTACT
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EDUCATION

University of Arizona, Tucson, AZ — August 2022 -
PhD in Statistics & Data Science

University of Arizona, Tucson, AZ — August 2022 - Dec. 2024
MS in Statistics & Data Science

College of William & Mary, Williamsburg, VA — August 2018 - May 2022
Bachelor of Science in Mathematics, Applied Mathematics Concentration
Minor in Computer Science

Northern Virginia Community College, Annandale, VA — August 2017 - May 2018

PUBLICATIONS

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

HONORS AND AWARDS

- Dean's list Fall 2018, Spring 2019, Spring 2020, Fall 2020, Fall 2021, Spring 2022
- Charles Center Honors fellowship to undertake research on a topic in applied mathematics in preparation for senior thesis. Summer 2023.
- Member of Phi Mu Epsilon (National Mathematics Honors Society)
- 2022 Virginia Commonwealth University RAMS Conference – Best presentation award for talk "Period Doubling Cascades from Models and from Data"

RESEARCH EXPERIENCE

University of Arizona, Department of Statistics & Data Science
Graduate research assistant, March 2025 – present
Advisor: Henry Scharf
Comparing methods of recursive Bayesian inference. Methods include parametric versus nonparametric assumptions, partitioning versus not partitioning datasets, and marginal versus joint distribution assumptions of the unknown parameters. Assessing the efficiency or efficacy of these methods to varying data types.

University of Arizona, Department of Aerospace & Mechanical Engineering
Graduate research assistant, January 2024 – December 2024
Advisor: Samy Missoum
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. Delivered weekly oral presentations.

College of William and Mary, Department of Mathematics
Honors senior thesis research, June 2021 – May 2022
Advisor: Sarah Day (College of William and Mary). Co-advisor: William Kalies (Florida Atlantic University)
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.

College of William and Mary, Department of Physics
Undergraduate research assistant, January 2020 – May 2020
Advisor: Seth Aubin
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.

PROJECTS

1. Created a program to generate adversarial mazes (longest path, greatest number of dead-ends, and largest search space) for various maze-solving algorithms (depth-first, uniform cost, greedy best, A* search). May 2025.
2. Experimented with various neural network architectures and regularization techniques for twitter sentiment analysis. May 2025.

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.

Northern Virginia Community College
Undergraduate teaching assistant, January 2018 – June 2018
Assisted nine individual physics lab groups, three people per group, with interpretation of labs. Introduced labs. Created video demonstrations on use of lab equipment. Provided support in math and physics through office hours for students.

Private Math Tutor
October 2017 – March 2018
Provided guidance to a middle school student in high-school geometry and algebra. Improved the student's math grades. Prepared student for high-school math competitions.

PRESENTATIONS

1. Richmond Area Mathematical Sciences Conference, Virginia Commonwealth University, April 2022. "Period Doubling Cascades from Data" (presentation)
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)

RELEVANT MEMBERSHIP

College of William & Mary Math club (2018-2022)

TECHNICAL SKILLS

- *Programming*: Python (also Pandas, Numpy, Scipy, Scikit-learn, GPy, Matplotlib, TF Keras), R, SAS (also Shiny)
- *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, optimization, time series forecasting, LateX

LANGUAGES

Croatian (fluent)
Russian (conversational)