Bailey Bjornstad

Mathematics Major at Northwestern University

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in bailey-bjornstad

Education

2015–Present **Mathematics**, *Northwestern University*, Evanston, IL, GPA: $3.7/4.0$
Undergraduate major in Math with emphasis on advanced classes where possible.
Relevant Courses:
- *ISP Math* — A three quarter intensive course covering multivariable calculus, ordinary differential equations, and linear algebra.
- *Foundations of Higher Math* — A single quarter course on the standards of mathematical proof.
- *MENU Real Analysis* — A three quarter intensive course that rigorously develops calculus, including measure theory.
- *MENU Abstract Algebra & Abstract Algebra* — Two quarters of an intensive course devoted to the study of groups and rings, followed by a one quarter course on Galois Theory.
- *Other Computer Science & Applied Math* — Various computer science and applied math courses covering topics including data structures, `Python` implementations of fundamental algorithms from machine learning, and computational neuronal modeling.

Music Technology, *Northwestern University*, Evanston, IL
Undergraduate minor in Music Technology, with coursework focused on synthesis and analysis of electronic music. In a degree project, co-designed and prototyped a laser harp digital music interface.

2011–2015 **High School Diploma**, *Pacific Ridge School*, Carlsbad, CA, GPA: $4.0/4.0$
Relevant Achievements:
- *Captain of Robotics Team* — Led a team of peers to multiple podium finishes in First Tech Challenge robotics competitions.
- *Theatrical Technical Director* — Organized and produced the technical side of yearly musicals and plays, particularly with regards to audio.

Experience

Mathematics

2017–Present **Teaching Assistant**, *Northwestern University*, Evanston, IL
Assisted professors of six multivariable and single-variable undergraduate calculus classes by running discussion sections and working one-on-one with students.

2017–2018 **Peer Tutor**, *Northwestern University*, Evanston, IL
Assisted fellow undergraduates of Northwestern University with a variety of math courses in a weekly, drop-in setting.

Summer 2017 **Independent Research in Math**, *Northwestern University*, Evanston, IL
Developed a concept of *mathematical fragility* in birth and death stochastic processes.
- Used `Python` and accompanying analytical tools to develop a preliminary model through simulation of birth and death stochastic processes.
- Mathematically analyzed examples to verify properties of these preliminary models.
- Abstractly developed these preliminary models using mathematical tools from probability to draw out quantities that describe the fragility of a process.

Fall 2016 **Research Assistant**, *Northwestern University*, Evanston, IL
Aided research on inquiry-based approaches to math education by recording classes and documenting student interactions in a novel classroom setting.

Miscellaneous

Summer 2016   **Research Assistant**, *University of California San Diego*, San Diego, CA

Developed a reusable analysis pipeline for single-cell RNA sequencing data used in research on middle-ear infections.

- Worked with the `R` programming language to analyze data sets for intuitive groupings.
- Wrote a series of scripts designed to process and analyze data sets to look for differences in groupings.
- Created visualizations of data in order to better understand the differences between these groups.

Summer 2014   **Research Assistant**, *Avelas Biosciences*, San Diego, CA

Used microassays and gel techniques to study novel cancer-targeting pharmaceuticals.

Awards

May 2016   **Excellence in Mathematics by a First-Year Student**, *Northwestern University*, Evanston, IL

Award given to students who display strong achievement in a number of advanced mathematics courses offered at Northwestern University.

May 2019   **Certificate of Recognition for Service as an Undergraduate Teaching Assistant**, *Northwestern University*, Evanston, IL

A certificate given to senior teaching assistants who dedicated their distinguished skills by continually serving Northwestern's math department.

Skills

Computer Skills

Programming	`Python, C#, C++, R`	*Proficient*
Statistics	`Numpy, Matplotlib`	*Proficient*
Typesetting	LaTeX	*Expert*
Linux	Built and maintain a customized installation of Arch Linux as my daily operating system.	

Languages

English	Fluent	*Mother tongue*
Spanish	Strong	*Proficient in communicating conversationally and in writing.*

Hobbies and Interests

Radio DJ   Host of *Non-Euclidean Space*, *Excitotoxicity*, and *Late Night Geometries* on WNUR 89.3 FM, with focus on electronic music of different geometries.

MTG   Have played the trading card game *Magic: The Gathering* at a competitive level.

Cooking   In the kitchen, a devotee of *Good Eats*'s Alton Brown and publications *Serious Eats* and *Cook's Illustrated*.