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Summary

Math PhD transitioning to a career outside of academia. I have spent the past year or so applying my analytic background to completing projects in machine learning, data analysis, and web development. My interests include writing/learning code and presenting hard topics in an attractive, down-to-earth way to a diverse audience.

Skills

- Python (pandas, BeautifulSoup/selenium, sklearn), HTML/CSS, JavaScript (d3.js), R/RStudio, LaTeX.
- Written, verbal, and visual communication. Excellent with attention to detail. Organized, objective- and efficiency-oriented. Can work independently or with a team. Delegation of responsibilities. Quick learner.

Selected Projects

Adventures in Learning Code **May 2017 - Present**

- Blog, written using Markdown. Posts about learning to code, a few machine learning posts.

"Do-nothing" Congress **May 2024**

- Uses Python to predict whether a bill introduced in the 118th Congress will become law.

Ashley's Fitbit Stats **April 2023**

- Dashboard displaying a year's worth of my Fitbit data. Graphics made using d3.js.

538 Project **March 2023**

- Python script that scrapes metadata from over 1,000 fivethirtyeight.com features pages.

Calculus Videos **Spring 2022**

- YouTube videos on calculus topics: derivatives, related rates, linear approximation, graphing a function.

Virtual Inspiring Talk **November 2020**

- YouTube playlist presenting the results from a recent project on matroid varieties to an undergraduate audience. Advice for members of minoritized groups who wish to pursue a PhD in mathematics.

Professional Development

Data Science Boot Camp **Erdös Institute (EI)** ***(Online)*** **May 2024**

- Certificate of completion. Data collection, data analysis and exploration, data cleaning, supervised and unsupervised learning.

Data Visualization Mini-course **EI** **April 2023**

- Certificate of completion. Plotting in Python (matplotlib, seaborn, plotly, bokeh), web browser visualizations: HTML (CSS, SVG, d3.js), basic Tableau, basic design principles.

ADJOINT **Simons Laufer Mathematical Sciences Institute (SLMSI)** ***(Berkeley, CA)*** **June 2021**

- African Diaspora Joint Mathematics Workshop (ADJOINT). Adventures in constructive Galois theory.

WiCA **Banff International Research Station** ***(Alberta, Canada)*** **October 2019**

- Women in Commutative Algebra (WiCA). *Toric and tropical Bertini theorems in positive characteristic*. Presented at the Joint Math Meetings (JMM) 2022 and other conferences.

Mathematics Research Communities **American Mathematical Society** ***(Snowbird, UT)*** **June 2015**

- *Finiteness of associated primes of local cohomology modules over Stanley-Reisner rings*. Presented at JMM 2017 and other conferences.

Work Experience

Visiting Assistant Professor (VAP) **Centre College** ***(Danville, KY)*** **Fall 2023 - Spring 2024 (FT)**

- Intro to stats with RStudio, ∼140 students. Mathematics in our society, 11 students. Debugged students' code in RStudio, helped students clean their final project data using MS Excel and R commands, facilitated and mediated group activities. Contributed to the department's statistics problem bank for automated quizzes and exams using the course management system Moodle's syntax for randomized questions.
- Addressed the problem of faculty frequently running out of lecture time by cutting the department's shared materials down 25% and typing solutions to all of them.

VAP **Georgia Institute of Technology (Georgia Tech)** ***(Atlanta, GA)*** **Fall 2021 - Spring 2023 (FT)**
- Intro and intermediate linear algebra, ∼100 students each. Graduate level commutative algebra, ∼20 students.
- Organized the weekly faculty algebra seminar (invited outside speakers, gave talks, managed the website).

VAP **Mount Holyoke College (MHC)** ***(South Hadley, MA)*** **Fall 2018 - Spring 2021 (FT)**
- Women's college.
- Calc I-III, group theory, ring theory, and discrete math, ∼30 students each. Produced materials for the virtual 2020-2021 SY (pandemic era) using LaTeX Beamer, Moodle, Gradescope, and Zoom. Wrote user guides for all of the technology used in the course. Flipped course structure; recorded pre-lecture videos and conducted synchronous instruction.
- Published *Geometric equations for matroid varieties* (Arxiv version).

VAP **James Madison University** ***(Harrisonburg, VA)*** **Fall 2017 - Spring 2018 (FT)**
- Calc I-II and linear algebra with differential equations, ∼30 students each. Taught students how to use SageMath commands to visualize and solve differential equations.

VAP **University of Arkansas (UArk)** ***(Fayetteville, AR)*** **Fall 2014 - Spring 2017 (FT)**
- Calc I and III, survey of calculus, and discrete math, 50-100 students each.
- Maintained a professional website and course webpages using HTML source code without a template.

Leadership

Mentor **ICERM, Brown University** ***(Providence, RI)*** **June 2024 (FT)**
- Roots of Unity at Institute for Computational and Experimental Research in Mathematics (ICERM). Graduate student workshop targeted at students of color who are women, nonbinary, and/or gender fluid.
- Guided the students through two classic papers on Gorenstein rings.
- Virtual inclusivity training (May 2024).

Teaching Assistant **EI** **May 2023 (PT)**
- Leadership certificate. Data science boot camp. Ran daily problem sessions and guided participants in machine learning exercises using Python.

Research Mentor (RM) **Georgia Tech** **Summer 2022 (FT)**
- Georgia Tech Research Experience for Undergraduates (REU). Selected three students from among hundreds of applicants to contribute to a research project on toric ideals.
- Organized weekly professional development seminars for all participants (∼30). Taught participants how to write technical papers, prepare slide shows, and make posters using LaTeX, via direct instruction and with templates I created.
- Controlled the budget for the participants' recreational activities (pizzas, museum visits, etc.).
- Presented results at Joint Math Meetings (JMM) 2023.

RM **SLMSI** **Summer 2016 (FT)**
- Formerly Mathematical Sciences Research Institute Undergrad Program (MSRI-UP). Summer research program for minoritized students.
- Produced and presented background group theory slides, up through the classification theorem for finitely generated abelian groups, with an introduction to sandpile groups. Included ∼50 exercises with full solutions.
- Published *The sandpile group of a thick cycle graph* (Arxiv version).

Service

Organizer **MHC** **Spring 2019 - Fall 2019**
- Discrete Math Days of the Northeast. Chose and invited speakers, recruited students.

Faculty Advisor (FA) **MHC** **Fall 2018 - Fall 2019**
- William Lowell Putnam Math Competition (Putnam). Top MHC score: 10/120 (national average: 0/120).

Judge **MHC** **Fall 2018**
- HackHolyoke. 24 hour hackathon. Over 50% of participants identifying as women and/or first-time hackers. Judge selection by invitation only.

FA **UArk** **Fall 2016**
- Putnam. Top UArk score: 26/120.

Education

PhD, Mathematics **University of Michigan** ***(Ann Arbor, MI)*** **2014**
- *Ideals generated by principal minors*, under Mel Hochster. Solving systems of polynomial equations. Published in two parts: Arxiv version of part 1 and part 2.
- Embedded MS, Mathematics, 2011.

BS, Mathematics **Kansas State University** ***(Manhattan, KS)*** **2008**
- Minor in Physics.
- McNair Scholar: *Symplectic topology of Hamiltonian systems with one degree of freedom*, under Ricardo Castaño-Bernard.