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Summary

Math PhD with 10+ years of experience researching, teaching, and mentoring. In transitioning from academia to a more data-driven career, I have been applying my analytic background to completing projects in machine learning, data analysis, and web development. I love: presenting complex topics and large data sets in an attractive, down-to-earth way to a diverse audience, compiling code, and algebra.

Skills

- Python (pandas, numpy, BeautifulSoup/selenium, sklearn, json, matplotlib).
- HTML/CSS, JavaScript (d3.js), Markdown.
- R/RStudio.
- LaTeX (Beamer, PlainTeX, BibTeX).
- Tableau.
- **Certifications:** Data science boot camp, Erdös Institute [certificate]. Data visualization minicourse, Erdös Institute [certificate].
- **Soft skills:** Able to delegate tasks to achieve overall success within prescribed timelines. Organized, objective- and efficiency-oriented. Can work independently or with a team. Quick learner. Effective written, verbal, and visual communicator. Excellent with attention to detail.
- **Knowledge of:** SQL, Node.js, C, YAML.

Selected Projects

Adventures in Learning Code [link] **May 2017 - Present**

- Blog written to help others who are learning data science and code. Posts about Python, JavaScript (d3.js, Node.js), SQL (MySQL), HTML/CSS, Tableau, machine learning, and C. Compiled using Markdown and YAML.

"Do-nothing" Congress [link] **May 2024**

- Used Python to aggregate data on over 15,000 bills introduced in the 118th Congress, then predict which bills will become law. Algorithm outperformed the baseline of 99.6% accuracy.

Ashley's Fitbit Stats [link] **April 2023**

- Dashboard displaying the impact of daily exercise on my sleep and resting heart rate. Made using d3.js and a year's worth of my Fitbit data aggregated using Python.

538 Project [link] **March 2023**

- Python script that scrapes metadata from over 1,000 fivethirtyeight.com features pages. Separate function to render JavaScript on each page and scrape the number of comments from the Facebook plugin – all to answer the question, which types of features get the most comments?

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 [certificate] **Erdös Institute** ***(Online)*** **May 2023 (PT)**

- Data science boot camp. Daily problem sessions, guided participants in machine learning exercises with 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 **SLMath** ***(Berkeley, CA)*** **Summer 2016 (FT)**

- Simons Laufer Mathematical Sciences Institute (SLMath), 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.

Professional Development

ADJOINT **SLMath** **June 2021**

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

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

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

MRC **American Mathematical Society** ***(Snowbird, UT)*** **June 2015**

- Mathematics Research Communities (MRC). *Finiteness of associated primes of local cohomology modules over Stanley-Reisner rings* [Arxiv version]. Presented at JMM 2017 and other conferences.

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.