Ashley K. W. Warren

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Summary

Math PhD with over 10 years of experience researching and mentoring. In transitioning from academia to a more data-driven career, applying previously gained analytic skills toward completing individual projects in machine learning, data analytics, and web development. Strengths: presenting complex topics and large data sets in an aesthetic, approachable way to a diverse audience, compiling code, and algebra.

Skills & Certifications

- **Data science:** Python (pandas, numpy, BeautifulSoup/selenium, scikit-learn, matplotlib), SQL, NLP, deep learning.
- **Software engineering:** GitHub, AWS, C.
- **Web:** HTML/CSS, JavaScript (d3.js, Node.js), Markdown, YAML.
- **Statistics:** R/RStudio, A/B testing, inferential statistics.
- **Presentation:** Tableau, LaTeX (Beamer, PlainTeX, BibTeX).
- **Soft skills:** MS Office. Able to delegate tasks to achieve overall success within prescribed timelines. Objective- and efficiency-oriented. Can work independently or with a team.
- **Certifications:** Data science boot camp, Erdös Institute [certificate]. Data visualization mini-course, Erdös Institute [certificate].

Leadership

Mentor **ICERM *(Providence, RI)*** **June 2024 (FT)**

- Institute for Computational and Experimental Research in Mathematics (ICERM), Roots of Unity. Mentored 30 graduate students of color who were women, non-binary, and/or gender fluid.
- Guided the students through two classic papers on Gorenstein rings over a period of four days. Recommended community-standard background literature.
- Fostered a culture that students reported as validative and inclusive for members of traditionally underrepresented groups to discuss mathematics.

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

- Data science boot camp. Supervised daily problem sessions with machine learning exercises using Python.

Research Mentor **Georgia Institute of Technology *(Atlanta, GA)*** **May - July 2022 (FT)**

- Georgia Tech Research Experience for Undergraduates (REU). Selected three students from over 500 applicants to contribute to a research program on toric ideals.
- Conducted weekly professional development seminars for all participants ($\sim$30). Taught participants how to write technical papers, prepare slide shows, and make posters using LaTeX, via instruction and original templates.
- Controlled the $2000 budget for the participants' recreational activities (pizzas, museum visits).
- Presented the results at Joint Math Meetings 2023, which attracted the attention of graduate school recruiters for the most senior participant.

Research Mentor **SLMath *(Berkeley, CA)*** **June - July 2016 (FT)**

- Simons Laufer Mathematical Sciences Institute (SLMath), formerly Mathematical Sciences Research Institute Undergrad Program (MSRI-UP). Directed a summer research project for $\sim$30 minoritized students.
- Produced and presented over 200 group theory slides, up through the classification theorem for finitely generated abelian groups, with an introduction to sandpile groups. Included over 50 exercises with full solutions.
- Published *The sandpile group of a thick cycle graph* with four coauthors [Arxiv version].

Work Experience

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

- Intro to stats, $\sim$140 students. Mathematics in society, 11 students. Assigned a final regression study to include on a data science resumé. Debugged students' code and helped clean project data using MS Excel and R commands. Facilitated and mediated group activities.
- Increased the department's statistics problem bank for automated quizzes and exams by 10% 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 all of the solutions.

VAP **Georgia Institute of Technology *(Atlanta, GA)*** **August 2021 - May 2023 (FT)**

- Intro and intermediate linear algebra, ∼100 students each. Graduate level commutative algebra, ∼20 students. Compiled a list of canon literature in commutative algebra from which students could choose a final project topic.
- Managed the website for the weekly faculty algebra seminar, invited ∼30 outside speakers, gave two talks.

VAP **Mount Holyoke College *(South Hadley, MA)*** **August 2018 - May 2021 (FT)**

- Women's college. Calc I-III, abstract algebra, discrete math, ∼30 students each. Produced materials for the pandemic era SY, including over 350 lecture slides. Recorded pre-lecture videos and conducted virtual synchronous instruction five times a week.
- Collaborated with two other authors to publish *Geometric equations for matroid varieties* [Arxiv version].
- Advised the William Lowell Putnam Math Competition team. Top MHC score: 10/120 (national average: 0). Judged the HackHolyoke 24-hour hackathon (over 50% of participants identifying as women).

VAP **James Madison University *(Harrisonburg, VA)*** **August 2017 - May 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 *(Fayetteville, AR)*** **August 2014 - May 2017 (FT)**

- Calc I-III, survey of calculus, discrete math, 50-100 students each. Transcribed over 600 calculus slides using LaTeX to overcome MS Powerpoint's limitations for properly formatting math equations and graphics.
- Maintained a professional website and fully responsive web pages for seven different courses using custom source code.
- Advised and recruited students for the William Lowell Putnam Math Competition. Top UArk score: 26/120.

Selected Projects

Coding Blog [link] **Present**

- Maintained a blog featuring seven years' worth of targeted content for aspiring data scientists. Posts about Python, JavaScript, SQL, HTML/CSS, Tableau, machine learning, and C.
- Compiled using Markdown and YAML. Template scripts streamline the process of writing a new post so that the formatting is only three lines of code.

2024 U.S. Presidential Election [link] **August 2024**

- Made a Tableau visualization of polling data from the 2024 U.S. presidential election. Downloaded three years' worth of polling data, over 4,000 polls, from fivethirtyeight.com. Imputed missing daily polling averages with Python.

Do-nothing Congress [link] **June 2024**

- Aggregated data with Python on over 15,000 bills introduced in the 118th Congress, then predicted which bills would become law. Algorithm outperformed the baseline of 99.6% accuracy.

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

- Learned d3.js and incorporated HTML/CSS to create a dashboard displaying the impact of daily exercise on sleep and resting heart rate.
- Relied on Python to clean one year's worth of personal Fitbit data stored in separate files and formats for each date.
- Learned new best practices for web design, then applied those practices to creating a personal website. Dashboard took 11 days total to complete, website took a weekend.

538 Project [link] **March 2023**

- Wrote a Python script that scrapes metadata from over 1,000 fivethirtyeight.com features pages.
- Included a specific function to render JavaScript on each page, then scrape the number of comments from the Facebook plugin, with the goal of investigating which types of features get the most comments.

Education

PhD, Mathematics **University of Michigan *(Ann Arbor, MI)*** **May 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)*** **May 2008**

- Minor in Physics.
- McNair Scholar: *Symplectic topology of Hamiltonian systems with one degree of freedom*, under Ricardo Castaño-Bernard.
- Nominee, Barry Goldwater Scholarship.