Ashley K. W. Warren

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Summary

Math PhD who specializes in systems of linear and polynomial equations. After 10 years in academia, I'd like to transition to a career where my analytical skills can help others to make data-driven decisions. I love problem-solving, writing/learning code, and presenting hard topics in an attractive, down-to-earth way to a diverse audience.

Skills

- LaTeX, Python (pandas, BeautifulSoup/selenium), HTML/CSS, R/RStudio, JavaScript (d3.js), Macualay2, C.
- Written and verbal communication, delegation of responsibilities. Organized, can work independently or with a team, quick learner, excellent with attention to detail.

Work Experience

Visiting Assistant Professor (VAP) **Centre College *(Danville, KY)*** **Fall 2023 - Present (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. Increased efficiency by learning to write cloze assignments via the course management system Moodle and configuring Moodle's gradebook. Contributed to the department's statistics problem bank for automated Moodle quizzes and exams.
- Addressed the problem of faculty frequently running out of time to present lecture materials by cutting the materials down 25% and typing solutions to all of them. Transcribed MS Word documents to LaTeX.

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, ∼10 students.
- Organized the weekly faculty algebra seminar (invited outside speakers, managed the website).

VAP **Mount Holyoke College (MHC) *(South Hadley, MA)*** **July 2018 - June 2021 (FT)**

- Women's college.
- Calc I-III, group theory, ring theory, and discrete math, on-site and remotely, ∼30 students each. Prepared materials for the 2020-2021 SY using LaTeX Beamer, Moodle, Gradescope, and Zoom. Prepared step-by-step user guides for all of the technology used in the course. Flipped course structure; recorded and posted 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

Group Leader **ICERM, Brown University *(Providence, RI)*** **10 - 14 June 2024 (FT)**

- Roots of Unity. First year graduate student workshop targeted at students of color who are women, nonbinary, and/or gender fluid.
- Selected 1-3 papers in commutative algebra for the students to spend the week reading.
- Virtual inclusivity training (May 2024).

Teaching Assistant **Erdös Institute (EI) *(Online)*** **May 2023 (PT)**

- 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 Expericence for Undergraduates (REU). Selected three underrepresented students from among hundreds of applicants to contribute to a research project on toric ideals. Applications in integer programming, mirror symmetry, coding theory, algebraic statistics, and geometric modeling.
- 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 the results of the group I directly mentored at Joint Math Meetings (JMM) 2023.

RM **Simons Laufer Mathematical Sciences Institute (SLMSI)** ***(Berkeley, CA)*** **Summer 2016 (FT)**

- Formerly Mathematical Sciences Research Institute Undergrad Program (MSRI-UP). Summer research program for students from underrepresented backgrounds.
- Produced and presented background slides on group theory, up through the classification theorem for finitely generated abelian groups with an introduction to sandpile groups. Included exercises with full solutions.
- Worked with two groups of three students each in a research project on sandpile groups.
- Published *The sandpile group of a thick cycle graph* (Arxiv version).

Service

Judge **MHC** **November 2018**

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

Faculty Advisor (FA) **MHC** **Fall 2018 - Fall 2019**

- William Lowell Putnam Math Competition (Putnam). National average: 0/120. Coached the MHC team (∼6 students) in 2018 and 2019. Top score: 10/120.

Organizer **MHC** **Spring 2018 - Spring 2019**

- Discrete Math Days of the Northeast. Annual conference. Chose and invited speakers, recruited students.

FA **UArk** **Fall 2016**

- Putnam. Top score: 26/120.

Professional Development

Data Science Boot Camp **EI** **Fall 2022 - Spring 2023**

- Data collection, data analysis and exploration, data cleaning, supervised and unsupervised learning.
- *538 Project*. Python script that scrapes metadata from the fivethirtyeight.com features pages.

Data Visualization Minicourse **EI** **Spring 2023**

- Plotting in Python (matplotlib, seaborn, plotly, bokeh), web browser visualizations: HTML (CSS, SVG, d3.js), basic Tableau, basic design principles.
- *Ashley's Fitbit Stats*. Dashboard displaying my exercise time and how it impacted my resting heart rate and quality of sleep. More in my Github repository.

African Diaspora Joint Mathematics Workshop **SLMSI** **Summer 2021**

- Adventures in constructive Galois theory. Studied parametrizations of Galois extensions.

Women in Commutative Algebra Banff International Research Station ***(Alberta, Canada)*** **October 2019**

- *Toric and tropical Bertini theorems in positive characteristic* (Arxiv version).
- Presented results at JMM 2022 and other conferences.

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

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

Other Projects

Blog **Summer 2017 - Present**

- *Adventures in learning code.* Things I've learned about coding languages, including C, Python, HTML, and Javascript. A few machine learning posts.

Calculus Videos **Spring 2022**

- Youtube videos featuring topics in a first semester calculus course: derivatives, related rates, linear approximation, graphing a function.

Virtual Inspiring Talk **Fall 2020**

- *Defining Equations for Matroid Varieties.* Youtube playlist on my project about matroid varieties with linear algebra. Targeted at undergraduates. Features advice for members of underrepresented groups who wish to pursue a PhD in mathematics.

Education

PhD, Mathematics **University of Michigan** ***(Ann Arbor, MI)*** **2014**

- Thesis: *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.
- Nominee, Barry Goldwater Scholarship.