Aaron Zoll

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EXPERIENCE

Johns Hopkins, Baltimore — *Teaching Assistant*

January 2020 - PRESENT

Supported instruction in multiple undergraduate and graduate-level courses through grading, leading weekly discussion sections, and providing academic support to students. Collaborated with faculty to reinforce core course concepts and foster a strong learning environment.

Johns Hopkins, Baltimore — *Course Developer*

Summer 2021 - 2025

Contributed to the design and development of new mathematics and engineering courses. Authored original lecture material, problem sets, and instructional resources tailored to enhance pedagogical clarity and student engagement.

Johns Hopkins, Baltimore — *MSE Orientation Review Session*

August 2023/2024

Designed and led a series of review sessions for incoming Master's students, covering foundational concepts in linear algebra. Developed comprehensive lecture notes and facilitated interactive discussions to prepare students for rigorous graduate coursework.

Mathnasium, Baltimore — *Tutor*

August 2019 - December 2019

Tutored students ages 6 to 18 in fundamental and advanced math topics. Adapted instruction to individual learning styles, promoting confidence and mastery in mathematics.

EDUCATION

Johns Hopkins, Undergraduate — *B.A in Mathematics*

August 2019 - May 2022

Johns Hopkins, Undergraduate — *B.S in Applied Mathematics*

August 2019 - May 2022

Johns Hopkins, Graduate — *M.S in Applied Mathematics*

August 2022 - May 2023

SKILLS

- Expertise in mathematical problem-solving, analytical reasoning, and quantitative analysis, with the adept ability to tackle complex challenges.

- Aptitude for delivering clear, engaging presentations and cultivating a dynamic, intellectually stimulating classroom environment.

- Proficiency in Matlab, Python, and Julia, with extensive experience in optimization algorithms and image analysis techniques.

AWARDS

- **Joel Dean Award for Excellence in Teaching** , department of Applied Math and Statistics (2019-2020)

- **Joel Dean Award for Excellence in Teaching,** department of Mathematics (2019-2020)

- **Gordon L. and Beatrice C. Bowles Fellowship** (2022-2023)

LANGUAGES

- Matlab
- Python
- Julia
- LaTeX
- Desmos
- Excel

Teaching Assistant

- Introduction to Computing
- Discrete Math (3 times)
- Calculus II
- Calculus III
- Differential Equations (2 times)
- Real Analysis
- Introduction to Computational Mathematics
- Cryptology and Coding
- Intro to Convexity (2 times)
- Optimization in Finance
- Mathematical Game Theory
- Mathematical Modeling and Consulting
- Matrix Analysis and Linear Algebra

PROJECTS

College Algebra (AS.110.102) — *Complete*

Course Developer, Johns Hopkins University

Collaborated with the Director of Online Programs to develop a comprehensive College Algebra course aimed at preparing incoming students for success in higher-level mathematics. Designed instructional content to reinforce key algebraic concepts through accessible and engaging materials.

Data Analysis Workshop (AS.110.020) — *Complete*

Course Developer, Johns Hopkins University

Developed and launched a summer course for high school students introducing the fundamentals of data analysis, probability, and statistics. Encouraged students to master affection presentation skills and collaborative work. Produced a full suite of materials, including lecture videos, online quizzes, interactive assignments, and guided Excel tutorials, delivered to over 50 students annually.

Optimization Research — *Ongoing*

Research with Dr. Benjamin Grimmer, Johns Hopkins University

Conducting theoretical research on composite optimization problems involving heterogeneously Hölder smooth and uniformly convex functions. Current work focuses on designing primal-dual algorithms with optimal convergence rates. Future directions include exploration in characterizing these dual notions, generalizing interpolation frameworks, and advancing performance estimation techniques.

Signal Processing Research — *Upcoming*

Planned collaboration with Dr. Mario Michelli & Kaleigh Rudge, Johns Hopkins University

Preparing to investigate spectral properties of the Discrete Fourier Transform and its connections to signal representation and harmonic analysis. Further investigation will include advancing understanding of the Fractional Fourier Transform, smoothly interpolating between the signal and frequency domains.

PAPERS UNDER REVIEW

- "A Universally Optimal Primal-Dual Method for Minimizing Heterogeneous Compositions" — April, 2025
  Aaron Zoll[†], Benjamin Grimmer — arxiv

TALKS

On Minimizing Heterogeneous Compositions

- Junior MINDS Seminar, *The Johns Hopkins University* — March, 2025
- International Conference of Continuous Optimization (ICCOPT), *The University of Southern California* — (*upcoming*) July, 2025
- The Institute for Operations Research and the Management Sciences (INFORMS), *Atlanta, GA* — (*upcoming*) August, 2025