Hasan Saad

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SUMMARY

Ph.D. candidate in Mathematics at the University of Virginia, specializing in number theory and modular forms. Proficient in programming and data science, seeking positions in machine learning, data science, and quantitative analysis.

EDUCATION

Ph.D. Mathematics, University of Virginia Aug. 2020 – May 2024

Advisor: Ken Ono

Thesis Title: On the Distributions of Point Counts on Hypergeometric Varieties

- Conducted research in number theory using tools from probability theory, arithmetic geometry, and automorphic forms.
- Instructor of record for Survey of Calculus I (MATH 1210) and Calculus II (MATH 1320).
- Leading mentor of undergraduate students in the REU in Number Theory.

M.S. Mathematics, American University of Beirut Sep. 2018 – Dec. 2020

B.S. Mathematics, Lebanese University Sep. 2015 – Jun. 2018

EXPERIENCE

Erdős Institute Data Science Boot Camp Sep. 2023 – Dec. 2023

- Developed a convolutional neural network with Gaussian filter and Discrete Fourier Transform to detect AI-generated images.
- Created a Gradio interface to showcase the model.
- Achieved top-5 finalist status among approximately 40 teams .

Lead Mentor, University of Virginia Jun. 2023 – Jul. 2023

- Lead Mentor for the UVA REU in Number Theory, focusing on distributions for matrix points on varieties.

Instructor, University of Virginia Aug. 2020 – Dec. 2023

- Taught MATH 1320 in Fall 2023 and MATH 1210 in Fall 2021, Spring 2022.
- Served as a Teaching Assistant for various math courses.

Assistant Mentor, University of Virginia Jun. 2022 – Jul. 2022

- Assisted in a UVA REU in Number Theory with a project on Sato—Tate analogue for some K3 surfaces.

Teaching Assistant, American University of Beirut Sep. 2018 – Dec. 2020

- Supported instruction for math courses.

SELECTED PROJECTS

Detecting Images Generated by Neural Networks Sep. 2023 – Dec. 2023

- Github Link: https://github.com/Alina-Beaini/AIvsReal
- Implemented a convolutional neural network to distinguish AI-generated images.
- Developed a Gradio interface for model visualization.

SELECTED PUBLICATIONS

- Explicit Sato—Tate type distribution for a family of K3 surfaces

CONFERENCE TALKS

- Invited speaker at 20 seminars and conferences, including the Joint Mathematical Meetings in Boston 2022 and San Franscisco 2023.

SKILLS

- **Technical Skills:** Python, C, Sage, Keras, TensorFlow
- **Languages:** English (bilingual), Arabic (native)