**Hasan Saad**

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**SUMMARY**

Passionate and detail-oriented Ph.D. candidate in Mathematics, with a deep interest in artificial intelligence and machine learning. My academic background, enriched by extensive analytical and statistical training, has prepared me for complex challenges in the AI field. I excel in problem-solving, data analysis, and computational methods. Eager to apply my skills in diverse AI environments, I am committed to contributing to innovative solutions in the rapidly evolving landscape of AI and machine learning technologies.

**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

* Due to being accepted for a Ph.D. in UVA before finishing my degree, I did not continue my studies for the 4th semester.

**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, PyTorch
* **Languages:** English (bilingual), Arabic (native)