

Gabriel Abreu

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EDUCATION

New York University, Courant Institute, New York, NY Aug 2025 – Present
Doctor of Philosophy (PhD), Mathematics

Brandeis University, Waltham, MA Aug 2021 – May 2025
BS in Applied Mathematics and Computer Science with Honors
Minor in Economics
GPA: 3.96 | Summa Cum Laude

RESEARCH EXPERIENCE

NYU Center for Data Science, New York, NY Apr 2026 – Present
Research Assistant — Prof. Andrew Gordon Wilson

- Develop efficient and scalable second-order optimization methods for training large language models.
- Implement large-scale training infrastructure in JAX on Cloud TPUs to evaluate Gauss–Newton-style methods.
- Benchmark optimization performance, computational efficiency, and convergence of curvature approximation methods against first-order optimizers such as AdamW.

Applied Math Lab at Courant, New York, NY Apr 2026 – Present
Research Assistant — Prof. Leif Ristroph

- Conduct experimental and computational research on real-world fluid dynamics problems, currently investigating the [Feynman sprinkler problem](#)
- Design experiments, develop calibration methodologies, and analyze experimental data using MATLAB.
- Featured in *The New York Times*: [“Physicists Have Argued Over This Problem Since 1883.”](#) describing our research on Feynman sprinkler problem, July 2026

Maunu Lab, Brandeis University, Waltham, MA Aug 2024 – May 2025
Research Assistant

- Co-authored [manuscript](#) on "A Smoothing Newton Method for Rank-one Matrix Recovery".
- Researched implicit regularization properties of Newton's Method, targeting quadratic convergence for nonsmooth phase retrieval problems
- Developed proofs of stability and investigated phase transitions via the Amplitude Flow algorithm

Lifespan Lab, Waltham, MA Jun 2023 – Sep 2024
Lead Undergrad Research Assistant

- Led a team of 6 research assistants to develop machine learning models for automated scoring of audio data from psychology experiments, reducing analysis time and accelerating research progress
- Implemented a model combining IBM Watson and open source code to track repeating sounds in MP3 files, achieving 96% accuracy in automated audio scoring

WORK EXPERIENCE

Brandeis Investment Management, Boston, MA Jun 2024 – Aug 2024
Data Science Intern

- Built a Retrieval-Augmented Generation (RAG) search engine for financial documents, and deployed an LLM using the AnythingLLM framework to retrieve and analyze thousands of files, significantly reducing manual processing time.
- Presented results to university leadership, with findings considered for adoption across departments; selected to present at the New England Statistical Society Data Science Day 2025.
- Evaluated green energy and venture capital investments and developed an Excel-based carbon model to quantify portfolio emissions and improve sustainability tracking.

Brandeis Library Scholarly Resources, Waltham, MA

Feb 2022 – Aug 2023

Systems Assistant

- Proposed and implemented an automation program to migrate 1,000+ staff profiles from legacy data archives to a new website
- Processed 3 million XML records in Python to separate them into collections for the library website

VOLUNTEERING & Leadership

Petey Greene Program, New York, NY

Aug 2026 – Present

Volunteer Tutor

- Tutor incarcerated students in academic subjects, supporting their preparation for college-level coursework and exams.
- Provide individualized instruction and mentorship to help students build academic confidence and develop effective learning strategies.

Brazil Conference at Harvard & MIT, Cambridge, MA

Jul 2024 – Present

Vice President

- Oversee the AI4Good program, coordinating the presentation of AI research and applications developed by Brazilian researchers to an international audience at Harvard.
- Mentor Brazilian scholars who have never left the country in developing and presenting open-source AI projects addressing socially relevant problems.
- Support backstage operations for high-profile speakers; guests have included the Fields Medalist Arthur Ávila or former Presidents of Brazil.

TAMID Group, Brandeis University, Waltham, MA

Aug 2022 – Feb 2024

Technology Consultant

- Delivered front-end, back-end, and data analytics solutions for client companies
- Optimized Vcomm's databases by implementing relational data structures, improving storage and retrieval efficiency

Department of Community Living, Brandeis University, Waltham, MA

Aug 2022 – May 2025

Resident Advisor

- Monitored a residence hall, supporting residents with personal concerns and coordinating maintenance resolutions
- Planned and executed community-building programs in collaboration with fellow advisors

Language Empowering Action Project, Brandeis University, Waltham, MA

Jan 2022 – May 2023

Volunteer Tutor

- Taught weekly English classes to adult immigrants and held one-on-one sessions to support individual progress
- Collaborated with a volunteer team to design lesson plans tailored to diverse learning needs

SKILLS

Programming: Python, Java, TensorFlow, Sklearn, Pandas, Matplotlib, spaCy, Flask, Selenium, Git, Jupyter, LaTeX

Software: Excel, VS Code, MS Suite, Eclipse

Languages: English (fluent), Portuguese (native), Spanish (intermediate)