ELEANOR WIESLER

Cambridge, MA — ewiesler@college.harvard.edu — eleanorwiesler.com

EDUCATION

Harvard University, Cambridge, MA — Sep 2021 - May 2025

A.B. Candidate in Mathematics, secondary in Computer Science (Highest Honors track)

- GPA: 3.83/4.00, SAT: 1510/1600
- **Selected Coursework:** Differential Geometry* Algebraic Topology*, Geometric Machine Learning*, Advanced Computer Vision*, Semi-Riemannian Geometry, Complex Analysis, Probability, Linear Algebra and Differential Equations, Abstract Algebra, General Chemistry, Statistical and Mechanical Physics, Statistical, Electromagnetism; Sets, Groups, and Real Analysis

*Graduate-level coursework (including Fall 2024)

EXPERIENCE

Harvard School of Engineering and Applied Sciences — Cambridge, MA
Undergraduate Researcher — May 2024 - Present

- Member of the Geometric Machine Learning (GeoML) Group advised by Professor Melanie Weber, where I conduct theoretical and applied research on machine learning on directed graphs. I am investigating discrete curvature-based approaches and applying differential geometry to graph neural networks to better understand directional data.
- Developing novel definitions for discrete Ricci curvature in the directed setting via the magnetic Laplacian and principles from quantum mechanics, and conducting large-scale computational experiments to test novel approaches on large networks. Writing thesis on my GeoML research for submission in May 2025.

Massachusetts Institute of Technology — Cambridge, MA
Geometry Research Fellow — June 2024 - Present

- Conducting geometry processing, graphics, and computer vision research in projects in the Summer Geometry Initiative (SGI) Fellowship that matches fellows with leading researchers in the fields of applied geometry.
- Under Prof. Paul Kry, I developed a novel approach for reduced deformation collision detection of meshes and implemented a new algorithm to detect mesh collisions under a variety of physical simulation scenarios.
- Under Silvia Sellan and Prof. Noam Aigerman, I am studying how to use signed-distance functions to train neural networks to predict the sweeping of 3D objects more accurately and studying how to represent discontinuities in a neural network's output. (Paper forthcoming)

University of Oxford Big Data Institute — Oxford, United Kingdom
Visiting Research Intern — Jun 2023 – Present

- Developed a novel unsupervised ML model for detection of outdoor time using time-series light data from wearable devices and light sensor data, currently first-authoring a paper on the novel method for application in UKBiobank.
- Developing a Python package for novel model. Presented findings to over 30+ Oxford researchers and professors and collaborated with deep learning and informatics teams on development of light sensor detection algorithm.
- Currently first-authoring a manuscript for publication and co-authoring two additional papers following position. Funded by Harvard Global Health Institute international research award.

Universidad Mayor — Santiago, Chile
Research Intern — Jun 2022 - Aug 2022

- Researched economic and statistical modeling of Chilean communities alongside Prof. Montalva at Universidad Mayor, utilizing R modeling, and genetic mapping, and theoretical frameworks for property and wealth distributions.
- Conducted research and all scientific and professional work in fully Spanish-speaking environment.
- Awarded prestigious grant by David Rockefeller Center for Latin American Studies to fund research internship.

Detect.com — Guilford, CT
Research Intern — Aug 2020 - March 2021

- Conducted molecular lab research project on SARS-CoV-2 polymerase chain reaction primers, contributed to the company's FDA-EUA authorization for at-home test product through molecular research experiments and reports.
- Worked with international computational team on designing loop-mediated amplification SARS-CoV-2 primers and studied performance in wet lab setting, first-authoring a 20-page white paper for research team on my contributions.

Yale School of Medicine — New Haven, CT
Research Intern — Jun 2019 - Jan 2020

- Co-authored a paper on vitamin B12 and folic acid as antagonists for the aryl hydrocarbon receptor in PNAS.
- Designed and conducted in-vivo and in-vitro liver cell experiments to characterize receptor pathway and contribute to published results, contributing to molecular new pathway discovery alongside MD-PhD students.

TEACHING AND LEADERSHIP

Harvard Department of Mathematics Cambridge, MA
Course Assistant Jan 2024 - Present

- Advanced Linear Algebra (Math 121) Course Assistant for Spring 2024 Semester. Taught students fundamentals of proof-based linear algebra in 1:1 and group settings, graded coursework, prepared lecture notes.
- Differential Geometry (Math 136) Course Assistant for Fall 2024. I will be teaching and mentoring students in one on one and group settings in introductory differential geometry concepts, grading papers, and assisting with lectures.

Girls Who Code Cambridge, MA
Instructor Apr 2018 - Present

- 6+ years of instruction teaching K-12 students foundations of programming, computer science.
- Served over 50+ students by giving lectures, designing computer science lesson plans and projects, and mentoring.

Boston Refugee Youth Enrichment Program Boston, MA
Co-Director Sep 2022 - Present

- Leader and instructor Boston educational after-school program serving 40+ refugee students with instruction in mathematics, science, and language-based classes for nonnative English-speaking students.

TALKS

July 2023, University of Oxford Big Data Institute, Wearables Group
September 2023, Harvard Global Health Institute
May 2024 - Geometric Methods in Machine Learning, Harvard AM220 Final Presentations

PUBLICATIONS

Kim, D. J., Venkataraman, A., Jain, P. C., Wiesler, E. P., DeBlasio, M... Iwasaki, A. (2020). Vitamin B12 and folic acid alleviate symptoms of nutritional deficiency by antagonizing aryl hydrocarbon receptor. Proceedings of the National Academy of Sciences - PNAS https://doi.org/10.1073/pnas.2006949117

SKILLS

- **Programming:** Python, R, C++, HTML/ CSS, SQL, JavaScript, Latex. (ML: Scikit-Learn, PyTorch, TensorFlow) (Geometry: PyG, Polyscope, Blender, GpyToolbox)
- **Languages:** Spanish (fluent), French, Portuguese, Mandarin (intermediate to elementary)
- **Research:** Published researcher, advanced quantitative and analytical skills, research presentations given globally.
- **Hobbies:** Jazz saxophone and music theory, painting, writing, and community service.