

George Stepaniants

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EDUCATION

SEP 2019 - Present GPA: 4.9/5.0	Massachusetts Institute of Technology (PhD) Department of Mathematics and Institute for Data, Systems, and Society (IDSS) PhD Advisors: Philippe Rigollet and Jörn Dunkel
SEP 2015 - JUNE 2019 GPA: 3.87/4.00	University of Washington (BSc) Department of Mathematics and Department of Computer Science (double major) Undergraduate Research Advisors: Nathan Kutz and Bing Brunton Research Project: <i>Inferring causal networks of dynamical systems through transient dynamics and perturbation</i>

ACADEMIC AWARDS

MIT Presidential Fellow	SEP 2019 - JUN 2024
NSF Graduate Research Fellowship	JUN 2019 - JUN 2020
Phi Beta Kappa Honors Society Member	JUN 2019
Mary Gates Research Scholarship (merit-based)	JUN 2019
University of Washington Dean's List	JUN 2016 - AUG 2016
Early acceptance to University of Washington at age 16 (UW Academy)	SEP 2015

TEACHING EXPERIENCE

1. Teaching assistant for 18.032 Differential Equations (Spring 2022)
2. Teaching assistant for 18.600 Introduction to Probability (Fall 2021)
3. Teaching assistant at University of Washington Math Circle (2015 - 2018)
4. Tutor students of all ages in mathematics from K12 to college-level subjects (2015 - 2019)

PUBLICATIONS

Manuscripts in Review

- George Stepaniants. "Learning partial differential equations in reproducing kernel Hilbert spaces." *arXiv preprint arXiv:2108.11580* (2021).

Journal Articles

- George Stepaniants, Bingni W. Brunton, and J. Nathan Kutz. "Inferring causal networks of dynamical systems through transient dynamics and perturbation." *Physical Review E* 102.4 (2020): 042309.

Conference Proceedings

- Enric Boix-Adserà, Hannah Lawrence, George Stepaniants, and Philippe Rigollet. "GULP: a prediction-based metric between representations." *Advances in Neural Information Processing Systems*.
- Sinho Chewi, Julien Clancy, Thibaut Le Gouic, Philippe Rigollet, George Stepaniants, and Austin Stromme. "Fast and smooth interpolation on Wasserstein space." *International Conference on Artificial Intelligence and Statistics*. PMLR, 2021.

TALKS AND PRESENTATIONS

Invited Talks

- "Learning PDEs in a Reproducing Kernel Hilbert Space", SIAM Conference on Mathematics of Data Science, San Diego, September 2022
- "Learning PDEs in a Reproducing Kernel Hilbert Space", Meeting on Mathematical Statistics, CIRM, Marseille, December 2021

Contributed Talks

- “Learning and predicting complex systems dynamics from single-variable observations”, APS March Meeting, Chicago, March 2022
- “Learning PDEs in a Reproducing Kernel Hilbert Space”, LIDS Stats & Tea, MIT, December 2021
- “Inferring causal networks of dynamical systems through transient dynamics and perturbation”, Econometrics Lunch, MIT, December 2021
- “Fusion of Genetically Incompatible Fungal Cells”, UCLA Computational and Applied Math REU Presentation, IPAM, August 2018
- “Quantifying Rupture Risk of Brain Aneurysms”, MATDAT18: NSF Materials and Data Science Hackathon, Alexandria, June 2018 (<https://matdat18.wordpress.ncsu.edu/files/2018/06/Team12.pdf>)
- “Hyperparameter Selection”, AI2 Research Internship Final Presentation, Seattle, August 2017
- “Beaker Experimentation Platform”, AI2 Research Internship Midterm Presentation, Seattle, August 2017
- “Image Analysis in Parkinson’s Research”, Pfizer Research Internship Final Presentation, Cambridge, August 2016

Posters

- “Inferring causal networks of dynamical systems through transient dynamics and perturbation”, Undergraduate Research Symposium, UW, June 2019

INTERNSHIP AND RESEARCH EXPERIENCES

JULY 2018 - AUG 2018	Research Experience for Undergrads in Computational and Applied Math at UCLA <i>Undergraduate Researcher in Mycofluidics Lab</i> Worked in Professor Marcus Roper’s lab on imaging of fungal cells in <i>Neurospora</i> and <i>Ashbya</i> fungal species. Collected data on nuclear division of these multinucleated cells using 3D imaging algorithms and performed data analysis on nuclear spacing and mixing within the cell. Discovered that genetically incompatible fungal strains fuse together when exposed to environmental stress. We are working on a paper that relies on the research findings and imaging algorithms I developed at UCLA.
JUN 2017 - SEP 2017	Engineering Intern at Allen Institute for Artificial Intelligence (AI2) <i>Full Stack Development and Data Analysis/Visualization</i> Collaborated with researchers and built a system which optimized hyperparameter selection in various neural network experiments ran in the company. I was responsible for experiment design decisions in the company and execution of these experiments on a Google cluster. My platform significantly simplified the experimentation process and reduced the runtime by a factor of two.
AUG 2016 - DEC 2016	Natural Language Processing Intern at ABBYY <i>Parser Accuracy Scoring</i> Compared ABBYY’s parser efficiency and output to that of MaltParser. Created scripts in Java to read parser output from CoNLL-X data files and scored them using an unlabeled and labeled attachment score (UAS and LAS). Used Excel for visual and graphing purposes.
JUN 2016 - AUG 2016	Image Analysis Intern at Pfizer, <i>Analysis of Brain Images with OpenCV</i> Worked in Neuroscience Pain Research Unit (NPRU) at Pfizer. Studied how various drugs help regenerate healthy cells damaged by neurodegenerative diseases, especially Parkinson’s. Used image analysis algorithms, 3D Watershed Segmentation in particular, to quantify the percentage of regenerated healthy cells after treatment. My automated imaging pipeline was used by researchers to quantify hundreds of drug profiles and reduced the runtime of their image analysis code by 10 times .

SERVICE AND LEADERSHIP

1. Founded and led Armenian Student Association at the University of Washington (ASAUW) 2015 - 2019
2. Competition judge at the University of Washington Math Olympiad 2015 - 2019