ADAM EISEN

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EDUCATION

Sep 2020 - Present

PhD in Brain and Cognitive Sciences, Massachusetts Institute of Technology
Miller Lab and Fiete Lab
Advisors: Professor Earl Miller and Professor Ila Fiete
- Applying dynamical systems models to neural data to investigate how dynamic stability varies across conscious states – primarily focused on propofol-induced unconsciousness

Sep 2014 - Apr 2018

Bachelor of Applied Science in Engineering, Queen's University
Mathematics and Engineering, Computing and Communications Option
- **Undergraduate thesis**: "Image Restoration Algorithms for Musical Style Transfer"
  Advisor: Professor Abdol-Reza Mansouri
  - Applied machine learning and computer vision to learn a musical style, and adapted a stochastic image model and Markov chain Monte Carlo methods to transform any audio sample into the learned style
  - Recipient of the Keyser Prize awarded to the two best Mathematics & Engineering theses
- **GPA:** 4.12/4.3
- **Dean's Scholar Designation** (2015, 2016, 2017, 2018)

RESEARCH AND WORK EXPERIENCE

Sep 2018 – Aug 2020

Heliolytics, Toronto, ON
Research and Development
- Developed and integrated machine learning and computer-vision algorithms for pixel-level aerial image matching, improving accuracy from about 75% to 99.9%
- Designed and constructed a distributed network of computing and monitoring systems to implement high volume image processing and analysis pipelines
- Constructed a framework using quantitative metrics and statistics to assess algorithm performance and improvement

May 2017 – Aug 2017

The Hospital for Sick Children Department of Genetics & Genome Biology, Toronto, ON
Machine Learning Researcher
Supervisor: Professor Lisa Strug
- Harnessed deep neural nets to build a TensorFlow model for predicting the likelihood of comorbidities in patients with cystic fibrosis (such as meconium ileus and decreased lung function), based on genetic data
- Built and compared the predictive power of additional models including random forests and LASSO regression

May 2016 – Aug 2016

University of Toronto Department of Biochemistry, Toronto, ON
Research Assistant
Supervisors: Professors Hue Sun Chan and Lewis Kay
- Optimized and expanded a C++ model to carry out Monte Carlo simulations of interactions among charged polymers leading to polymer phase separation
- Devised efficient algorithmic solutions to complex logical and three-dimensional problems related to protein structure, movements and interactions
- Validated an analytic theory regarding polymer radius of gyration

DISTINCTIONS AND AWARDS

2018	**Annie Bentley Lillie Prize in Mathematics,** awarded to the graduating student in Mathematics and Engineering who has the highest average on courses in mathematics in the final year
2017	**Nellie and Ralph Jeffrey Award in Mathematics,** awarded to the student entering the fourth year of the Mathematics and Engineering program, or of an honours program with a Mathematics major, having the highest standing in the mathematics courses of the first three years and an overall first-class average
2016	**Nellie and Ralph Jeffrey Award in Mathematics**
2016	**Susan Near Scholarship,** for standing on year's work
2015	**H. Janzen Memorial Scholarship,** awarded annually to the student who attained the highest standing in the first year physics courses in Applied Science
2015	**R. L. Dorrance Memorial Scholarship,** given by the Engineering Society for highest standing in the first year chemistry courses in Applied Science
2015	**Annie Bentley Lillie Prize in First Year Calculus,** awarded to students with high standing in any first year calculus course
2014, 2015	**Carl Reinhardt Entrance Scholarship in Physics,** for high standing in physics
2014, 2015	**Principal's Entrance Scholarship,** for obtaining grade 12 average of 98%
2014	**Valedictorian of the high school graduating class,** selected by peers and faculty

TEACHING EXPERIENCE

Sep 2021 – Dec 2021

Teaching Assistant, Massachusetts Institute of Technology

- 9.07 Statistics for Neuroscience: led recitations, conducted review sessions, and filled in as primary lecturer when the instructor was unavailable

Sep 2016 – Apr 2018

EngLinks Tutoring, Queen's University

Tutor and Workshop Leader

- Prepared materials and conducted in-depth exam workshops for courses such as Differential Equations, Real Analysis and Electricity and Magnetism
  - Led workshops of 60-100 students

May 2015 – Jul 2015

Private Tutor, Toronto, ON

- Delivered tutoring services in math, science and jazz history to 10 high school and university-level students, with successful academic outcomes

PUBLICATIONS

[1] Das S., **Eisen A.**, Lin Y.H., and Chan H.S., "A Lattice Model of Charge-Pattern-Dependent Polyampholyte Phase Separation". Journal of Physical Chemistry B Vol. 122, pp. 5418-5431 (2018).

ADDITIONAL INFORMATION

Tools

Python, Slurm, SQL, Matlab, PyTorch, Keras, Tensorflow, OpenCV, R, React, Java, C

Additional Experience and Honours

- Offered major scholarship to Berklee College of Music (Apr 2014)
- Vocal and piano performer and teacher (Sep 2010 – Apr 2018)

Interests

- Musical composition and performance
  - Co-wrote, recorded and released several albums with Erez Zobary (Jul 2019 - Present)
  - Released an EP under moniker Kodachrome (Nov 2016)
- Yoga, hiking, running, biking and long-distance cardio – completed triathlon in Aug 2018