

Christopher Rohlicek

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EDUCATION

2020 - 2021 **Brown University** – ScM in Data Science (GPA: 4.0/4.0)

Relevant Coursework: Probability, Statistics, and Machine Learning; Data Engineering; Statistical Learning; Deep Learning and Special Topics in Data Science; Modern Applications of Probability and Statistics

2016 - 2020 **Harvard University** – AB in Applied Mathematics (GPA: 3.6/4.0)

Relevant Coursework: Matrix Methods in Data Analysis, Signal Processing, and Machine Learning; Decision Theory; Abstraction and Design in Computation; Computer Networks; Optimization; Honors Linear Algebra and Multivariable Calculus and Real Analysis; Theory of Groups and Vector Spaces; Vector Space Methods for Differential Equations

WORK EXPERIENCE

Broad Institute of MIT and Harvard

September 2021 - present

Associate Computational Biologist – Popic Lab

- Researching applications of novel deep learning approaches to detecting genomic structural variation
- Leading investigations of generative adversarial network (GAN) applications to histology imaging, novel evaluation metrics for GANs, and metric-learning approaches to measuring genomic relatedness
- Developing simulation software for modeling complex genomic variation and creating synthetic genomes for training and evaluation of machine learning methods
- Initiated, and co-leading, interdisciplinary reading group exploring machine learning and applications in computational biology

Brown University – Carney Institute for Brain Science

June 2020 - August 2021

Research Assistant to Prof. Jason Ritt

- Investigated dynamical dimensionality reduction of neurophysiological brain models
- Used recurrent neural networks to solve inverse problem posed by empirical neural spike data
- Developed method for dimensionality reduction of high-dimensional dynamical systems

MIT Lincoln Laboratory

May 2019 - August 2019

Research Intern with Dr. Michael Brandstein

- Applied signal processing and speech recognition techniques to identify bird species from flight call data
- Combined CNNs and k-nearest neighbors to improve on best published accuracy from 94% to 99%

O&R Patent Law

May 2018 – August 2018

Software Intern

- Developed Python-based productivity tools to save hundreds of person-hours
- Used Python and SQL to automate entity resolution and summarization of records for financial analysis

PUBLICATIONS AND PRESENTATIONS

Popic, V., **Rohlicek, C.**, Cunial, F., Garimella, K., Meleshko, D., Hajirasouliha, I. (2022) “A Deep Learning Framework for Structural Variant Discovery and Genotyping.” *Nature Methods* (accepted).

Lecture titled “Introduction to Neural Networks: Applications and Intuition” presented as part of a course taught by V. Popic at the *East European Bioinformatics and Computational Genomics School*; October

2022

Brendel, M. Honigsberg. R, Maharjan S., **Rohlicek, C.** “Weakly-supervised tumor purity prediction from HE stained slides.” Poster presented at 2022 Starr Cancer Consortium Retreat; April 2022; Cold Spring Harbor, NY.

“A deep learning approach to structural variant discovery” and “Cue: A framework for cross-platform structural variant calling and genotyping with deep learning,” presented with V. Popic at Models, Inference Algorithms Initiative interinstitutional seminar series, Broad Institute of MIT and Harvard, February 2022.

SELECT PROJECTS

Molecular Toxicity Prediction

Deep Learning and Special Topics in Data Science, Brown University

Completed research on the use of CNNs and BERT-inspired models for the processing of SMILES molecule representations; implemented a novel strategy for predicting toxicity.

Neural Network Parameter Reduction Using Pruning and Matrix Decomposition

Matrix Methods, MIT (cross-registered)

Conducted experiments in PyTorch comparing effects of magnitude-based pruning techniques to matrix decomposition methods of network size reduction.

REVIEWS

ISMB (Conference): 1 paper

TECHNICAL SKILLS

Programming Languages	Python, Java, OCaml, SQL, R, MATLAB, Julia, Bash
Libraries	PyTorch, Tensorflow, Keras, Pysam, Numpy, Pandas, Scikit-learn