Christopher Rohlicek

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EDUCATION

Brown University Providence, RI
ScM in Data Science. GPA 4.0/4.0 September 2020 – August 2021
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

Harvard University Cambridge, MA
AB in Applied Mathematics. GPA 3.6/4.0 September 2016 – May 2020
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

EXPERIENCE

Broad Institute of MIT and Harvard Cambridge, MA
Associate Computational Biologist – Popic Lab September 2021 – Present
- Researching applications of deep learning to solve problems related to genomic structural variation and histology imaging
- Developing software pipelines for simulating genomic variation and benchmarking and analyzing results of variant callers
- Initiated, and co-leading, interdisciplinary reading group exploring machine learning and applications in computational biology

Brown University – Carney Institute for Brain Science Providence, RI
Research Assistant to Prof. Jason Ritt June 2020 – August 2021
- 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 Lexington, MA
Research Intern with Dr. Michael Brandstein May 2019 – August 2019
- Applied signal processing and speech recognition techniques to identify bird species from flight call data
- Combined CNNs and k-nearest neighbors to improve state-of-the-art benchmark classification from 94% to 99%

O&R Patent Law Boston, MA
Software Intern May 2018 – August 2018
- 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* (in review).

*"*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, at 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, at Harvard University):
- Conducted experiments in PyTorch comparing effects of magnitude-based pruning techniques to matrix decomposition methods of network size reduction.

TECHNICAL SKILLS

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