KAELA NELSON

kwnelson@g.harvard.edu • Github: kaelanelson • (857) 334-1172

EDUCATION

Harvard University Cambridge, MA
Master of Engineering in Computational Science and Engineering Expected May 2021
Cumulative GPA: 3.92/4.00

- Honors: 2019, 2020 Recipient of Clifford Fund Scholarship
- Relevant Coursework: Data Science I & II, Advanced Numerical Methods, Systems Development for Computational Science, Computing Foundations for Computational Science

Brigham Young University Provo, UT
Bachelor of Science in Mathematics April 2019
Cumulative GPA: 3.79/4.00

- Honors: Phi Eta Sigma (2015)
- Relevant Coursework: Algorithm Design and Optimization, Modeling with Uncertainty and Data, Deep Learning

WORK EXPERIENCE

Research Computing, Boston Children's Hospital Boston, MA
Data Science Intern May 2020 - August 2020

- Developed preprocessing scripts to obtain properly formatted genome data files for three structural variant detection algorithms: delly, lumpy, and canvas
- Built Nextflow pipelines and implemented these three algorithms in order to predict novel structural variants
- Implemented gor queries on WuXi Nextcode and Sequence Minor to filter and analyze algorithms' results

Institute of Applied Computational Science, Harvard University Cambridge, MA
Undergraduate Research Fellow June 2018 - August 2019
Advisors: Dr. Francesca Dominici, Dr. Danielle Braun & Dr. Weiwei Pan

- Implemented unsupervised machine learning models in order to discover statistically interesting subpopulations most susceptible to high PM 2.5 exposure within Medicaid claims data
- Created automated scripts to convert and bin ICD-9 codes within Medicaid data

PROJECT & RESEARCH EXPERIENCE

Institute of Applied Computational Science, Harvard University Cambridge, MA
Independent Research Project September 2019 - Present
Advisors: Dr. Francesca Dominici & Dr. Danielle Braun

- Performed extensive exploratory data analysis and feature engineering on Medicaid data (29,000 claims) to analyze the causal effect of PM 2.5 exposure on the re-hospitalization of patients with cardiovascular disease
- Built and implemented propensity score models to adjust for confounding variables within Medicaid data

Institute of Applied Computational Science, Harvard University Cambridge, MA
Geospatial Analysis Project Spring 2020

- Performed feature engineering on google earth engine satellite image data set merged with US census data
- Built and trained CNN, Sequential CNN, and Unet neural network models on 1400 satellite images to predict US block census population with an average error of 1500 people per census block

Institute of Applied Computational Science, Harvard University Cambridge, MA
Predicting Galaxy Measurements Project Spring 2020

- Built and trained CNN and Unet neural network models on 18,000 simulated satellite galaxy images to predict five galaxy image features: flux, shear, shape, sersic index and radius
- Predicted galaxy image parameters with mean squared error of 0.0736 and 0.077 for shear and shape parameters

TECHNICAL SKILLS

Programming: Python, R (Intermediate), Git, Nextflow, LaTeX, WuXi Nextcode (Beginner)