ELLIOT HILL

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EXPERIENCE

AI Health Fellow | Duke University | Duke AI Health Fellowship 2023 - Present

- Developed AI models for longitudinal prediction of adolescent mental health using data from the largest US study of childhood neurodevelopment (Nature Medicine | provisionally accepted | first author | code)
- Trained a discrete time-to-event neural network for early longitudinal prediction of ADHD using electronic health records (EHR) with state-of-the-art performance (Translational Psychiatry | in review | first author)
- Built a scalable large language model retrieval pipeline for efficient diagnosis classification from clinical notes
- Trained deep learning models to predict autism status using insurance claims data
- Built an analytic database for EHR used by ten projects in the biostatistics and bioinformatics department
- Simulated experiments for balancing early and accurate diagnosis predictions using reinforcement learning

Data Scientist | Beth Israel Deaconess Medical Center | Harvard Medical School 2021 - 2023

- Designed a Python package for calculating similarity-sensitive entropy and diversity indices
- Developed a Python package for converting Covid PCR tests results to viral loads (first author | paper)
- Trained a neural network to predict antibody classes from protein sequences
- Created a machine learning pipeline to predict Covid immune response from antibody sequences
- Refactored a 5000-line code base to 200 lines with improved performance and functionality

Contract Data Scientist | Loyola University 2020 - 2021

- Developed a package to aid in the discovery of taxonomic variation in protein composition (first author | paper)
- Optimized the code of a bioinformatics data pipeline and increased program execution speed by 1500%

Machine Learning Intern | NASA Glenn Research Center Summer 2020

- Built a neural network in PyTorch for detecting and segmenting biological structures in images
- Wrote a program to generate a computer vision dataset of artificial biological patterns in Python

EDUCATION

M.S. Computational Science GPA: 4.0, Tulane University 2018 - 2020

Masters thesis: discovered best practices for reducing the computational cost of training machine learning algorithms and statistical models without sacrificing prediction accuracy

B.S. Ecology & Evolutionary Biology GPA: 3.845, Tulane University 2014 - 2018

Honors thesis: collected, processed, and analyzed flamingo social network data using multilevel models

Capstone project: built hierarchical Bayesian models for spatial multiple systems estimation

Relevant coursework

Machine learning, statistical learning, programming (I, II), genomics and bioinformatics, biostatistics, scientific computing (I, II, III), data visualization, differential equations, high-performance computing, biological math models

Awards

Leaders in Service Award, The Gerald E. Gunning Memorial Award, Honors in EBIO, Deans List

SKILLS

Machine learning, numerical mathematics, applied statistics, programming, scientific computing, simulation, data visualization, databases, software development, data processing, technical writing, presenting

Languages: Python, R, MATLAB, SQL
Data science packages: numpy, polars/pandas, pytorch, huggingface, torchrl, scipy, scikit-learn, tidyverse
Tools: Git, GitHub, LaTeX, SLURM, Docker, Jupyter, Microsoft Office, vim