BEN HEIL

autobencoder.com | github.com/ben-heil | ben.jer.heil@gmail.com

EDUCATION

- PhD Candidate | University of Pennsylvania | Genomics and Computational Biology | Expected Grad Dec. 2022
- BSI, Bioinformatics | Baylor University | Magna Cum Laude | Graduated 2018

EXPERIENCE

University of Pennsylvania   **Casey Greene Lab**
PhD Candidate   *Aug 2018 to present*
- Researched the use of deep learning on RNAseq data for disease diagnosis
- Evaluated the efficacy of transfer learning for predictions from RNAseq data
- Built a benchmark for comparing linear and deep learning models across supervised tasks
- Tech Stack: Pytorch + Jupyter + Conda + Snakemake + Github Actions + Pytest

Baylor University   **Erich Baker Lab**
Undergraduate Researcher   *Oct 2016 to May 2018*
- Helped develop software to generate motifs for classifying protein functionality with machine learning
- Configured and managed an nginx/uWSGI webserver to host tools developed in the lab

NIH National Institute of Allergy and Infectious Diseases   **Mariam Quinones Lab**
Summer Fellow   *June 2017 to July 2017*
- Used Qiime and Nephele to analyze whether celiac disease affects the human microbiome
- Evaluated several metagenomic aligners for use in a pathogen detection pipeline

NIH National Human Genome Research Institute   **Jim Mullikin Lab**
Summer Fellow   *May 2016 to August 2016*
- Profiled and wrote improvements for the genetic comparison software TILDE
- Developed a quality control pipeline for metagenomic samples

TECHNICAL COMMUNICATION

CIS522 Deep Learning - TA   **2021**
- Taught a pod of students in a flipped classroom graduate course
- Developed the tutorial and homework for transfer learning and image models (tutorial notebook here)

Deep Learning For Biologists Workshop - Co-Organizer   **2020**
- Organized, advertised, and lectured at a deep learning workshop aimed towards biologists (lecture video here)

Autobencoder.com - Author   **2020-present**
- Write about machine learning, computational biology, and academia
- ~650 unique users monthly

PUBLICATIONS

- **Benjamin J. Heil**, Michael M. Hoffman, Florian Markowetz, Su-In Lee, Casey S. Greene, Stephanie C. Hicks. Reproducibility standards for machine learning in the life sciences. Nature Methods (2021). https://www.nature.com/articles/s41592-021-01256-7

- S M Ashiqul Islam, **Benjamin J. Heil**, Christopher Michel Kearney, Erich J Baker. Protein Classification Using Modified n-gram and Skip-gram Models. Bioinformatics (2018). https://academic.oup.com/bioinformatics/article/34/9/1481/4772682

SIDE PROJECTS / COMPETITIONS

- Crop classification contest - Won $500 in a contest for predicting which crops were planted from satellite images
- Weather prediction competition - Won $850 for predicting geolocated precipitation levels five weeks in the future
- Terminal programming competition - Programmed an agent to play a tower defense game as part of a two-person team. Won $500 for placing in the top four in the US East Regional.
- Philly covid dashboard - Wrote a Streamlit app to ingest and visualize publicly available COVID data

AWARDS

- Goldwater Scholarship Honorable Mention
- Baylor Bioinformatics Outstanding Senior Award
- National Merit Scholarship Recipient
- Baylor CS Department Scholarship

TECHNICAL SKILLS/PROGRAMMING LANGUAGES RANKED BY FAMILIARITY

- Python - Primary programming language for projects
- Conda + Github Actions - Primary package management/CI; wrote a blog post about how to use them together
- R - Secondary language for PhD
- SQL/GraphQL/Neo4j/Mongodb - Used in one-off projects
- C++/Java - Primary programming languages in undergrad