

# Hannah Pieper

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Mathematics PhD with expertise in data science, machine learning and computational modeling. Has experience managing long term projects and passion for accessible technical communication.

## EDUCATION

**BOSTON UNIVERSITY**  
(Dec. 2023) | Boston, MA  
PHD IN MATHEMATICS  
GPA: 4.00/4.00

**BOSTON UNIVERSITY**  
May 2020 | Boston, MA  
MA IN MATHEMATICS  
GPA: 3.98/4.00

**OBERLIN COLLEGE**  
May 2018 | Oberlin, OH  
BA IN MATHEMATICS  
with high honors

## SKILLS

### PROGRAMMING

Python • Julia • MySQL •  
Matlab • R • Java • Bash •  
LaTeX

### TOOLS

Scikit-learn • PyTorch •  
TensorFlow • Pyro •  
Matplotlib • Seaborn •  
Pandas • Git • Jupyter •  
RStudio

## COURSEWORK

### UNDERGRADUATE

Mathematical Modeling  
Data Structures  
Linear Optimization  
Probability  
Statistics

### GRADUATE

Statistical Learning  
Deep Learning  
Algorithms for Big Data  
Optimization for ML

## CERTIFICATIONS

### COURSERA

SQL for Data Science

### THE ERDÖS INSTITUTE

Data Science Bootcamp

## INDUSTRY EXPERIENCE

### DYNO THERAPEUTICS

#### MACHINE LEARNING ENGINEER INTERN

- Increased flexibility of machine learning models and design pipeline for sequence prediction of Adeno-Associated Virus (AAV) for gene therapy.
- Validated current model quality by researching, testing and implementing new dynamic ensemble strategies in Pyro and Pytorch as benchmarks.
- Increased correlation between predictions and actual score by up to .05 of top performing AAV sequences via feature engineering; presented results department-wide.

### WATERTOWN, MA

JANUARY - MAY 2022

## RESEARCH EXPERIENCE

### BOSTON UNIVERSITY

#### GRADUATE RESEARCHER

*Spectral Stability of Nonlinear PDEs*

- Developed new computational frameworks and computer assisted proofs for the instability of pulse solutions to the Swift-Hohenberg equation.
- Designed packages for computer assisted proofs in dynamics using Matlab and object-oriented design.
- Presented in 2 international conferences; 2 publications are in progress.

*Machine Learning and Anomaly Detection*

- Classified cancerous gene data with a novel functional data analysis approach, outperforming benchmark metrics by 1%.
- Measured effects of limited data on predictions by running simulations on the BU supercomputer (Linux cluster).

#### GRADUATE INSTRUCTOR

SEPTEMBER 2018 - DECEMBER 2020

- Taught 3 full undergraduate courses; designed inquiry based learning activities and metacognition exercises; distributed original materials among other instructors for reuse.

## TECHNICAL PROJECTS

### CLASSIFYMYMEDS: PREDICTING CLAIM APPROVAL AND VOLUME

The Erdős Institute | Github

- Corporate data science project sponsored by CoverMyMeds; placed 3rd out of 50 teams.
- Surveyed 7 classifiers to predict claim approval rate; analyzed statistical significance of results.
- Forecasted future volume of claims at daily and yearly levels with time series analysis techniques; volume forecasts were within 5% of true volume with high probability.

### SOLVING PDES VIA DEEP NEURAL NETS

University Project | Github

- Reconstructed the dynamics underlying noisy spatio-temporal data by implementing two deep learning models in Tensorflow.
- Reproduced published results; extended analysis by studying a previously unexplored system resulting in a written report.