Beepul Bharti

beepulbharti | bbharti | beepulbharti.github.io | bbharti1@jh.edu

EDUCATION

Johns Hopkins University — Baltimore, MD
PhD in Biomedical Engineering — 2020 - Present

- GPA: 4.00/4.00
- Advisor: Dr. Jeremias Sulam
- Relevant Coursework: Statistical Theory, Matrix Analysis, Statistical Pattern Recognition, Sparse Representations in CV and ML, Nonlinear Optimization, Causal Inference, Probabilistic Models in Vision

Duke University — Durham, NC
BS in Biomedical Engineering & BA in Mathematics — 2016 - 2020

- GPA: 3.86/4.00, *Cum Laude & Distinction*
- Relevant Coursework: Real Analysis, Abstract Algebra, Mathematical Fluid Dynamics, Applied PDEs & Complex Variables, ODEs, Signals and Systems, Probability, Multivariable Calculus, Biostatistics

INDUSTRY AND RESEARCH EXPERIENCE

Genentech, Machine Learning Intern — San Francisco, CA
Deep Learning Theory and Algorithms Team, Advisor: Alex Tseng — May 2024 - August 2024

- *Motif Discovery*: Developed an interpretability algorithm to detect DNA motifs and infer biological syntax

Duke University Pratt Research Fellow — Durham, NC
Advisor: Dr. Brenton Hoffman — June 2018 - May 2020

- *Force Dependent Vinculin Dynamics*: Developed mutated molecular sensors to study focal adhesions

Bass Connections Fellow — Durham, NC
Advisor: Dr. Rakesh Gopalkumar — June 2017 - May 2018

- *ML for Schizophrenia Admittance*: Developed ML models to predict schizophrenia admittance

PUBLICATIONS (*INDICATES EQUAL CONTRIBUTION)

1. **B. Bharti**, P. Yi, and J. Sulam, "Estimating and Controlling for Equalized Odds via Sensitive Attribute Predictors", *Advances in Neural Information Processing Systems (NeurIPS)*, 2023.
2. J. Teneggi*, **B. Bharti***, Y. Romano, and J. Sulam, "SHAP-XRT: The Shapley Value Meets Conditional Independence Testing", *Transactions on Machine Learning Research (TMLR)*, 2023.
3. D. Li, **B. Bharti**, J. Wei, J. Sulam, and P. Yi, "Sex Imbalance Produces Biased Deep Learning Models for Knee Osteoarthritis Detection", *Canadian Association of Radiologists Journal*, 2022.

TEACHING EXPERIENCE

Teaching Assistant, *(EN.580.69) Biomedical Data Design* — Fall 2022 & Spring 2023
Instructors: Dr. Adam Charles, Dr. Jeremias Sulam.

Head Teaching Assistant, *(EN.580.697) Computational Cardiology* — Fall 2021
Instructors: Dr. Natalia Trayanova

Teaching Assistant, *(ECE 110L) Introduction to Electrical Engineering* — Fall & Spring 2018
Instructors: Dr. Lisa Huettel, Dr. Stacy Tantum

Tutor, *(CHEM 101DL) Chemistry & (MATH 221) Multivariable Calculus* Fall 2017
Instructors: Dr. Christopher Roy, Dr. William Pardon.

FUNDING/SUPPORT

- JHU Mathematical Institute for Data Science Fellowship 2021 - 2022
- NIGMS Pre-Doctoral Grant in Computational Medicine 2020 - 2021

AWARDS AND FELLOWSHIPS

- Alpha Eta Mu Beta: National Biomedical Engineering Honor Society 2023
- JHU Mathematical Institute for Data Science Fellow 2022
- Tau Beta Pi: The Engineering Honor Society 2019
- Duke Pratt Fellow 2020
- Duke BioCore Scholar 2019
- Duke Bass Connections Fellow 2018

SERVICE

- Reviewer for TMLR, FAccT, ISIT, AISTATS, NeurIPS XAIA

LEADERSHIP/EXTRACURRICULARS

Whiting Internships in Science and Engineering (WISE) 2024
Position: High School Student Mentor

JHU BME Application Assistance Program (BMEAAP) 2021 - 2022
Position: Mentor Liaison

Duke Student Government 2018 - 2019
Position: Senator for Academic Affairs

TEDxDuke: Uncharted Waters 2017
Talk Title: Why We Should All Be Interested In Space

TALKS AND POSTERS

- Explainable AI Seminars at Imperial College London [talk] 2024
  SHAP-XRT: The Shapley Value Meets Conditional Independence Testing
- EN.540.464: Advanced Biomedical Data Science for Biomedical Engineering [talk] 2024
  Algorithmic Fairness in Machine Learning and Data Science
- Columbia University Workshop on Fairness in Operations and AI [poster] 2024
  Fairness via Sensitive Attribute Predictors
- Radiological Society of North America (RSNA) Annual Meeting [talk] 2023
  Evaluating Fairness of AI Models in Radiology
- Johns Hopkins AI-X Foundry Fall Symposium [poster] 2023
  Fairness with Missing Sensitive Attributes
- EN.540.464: Advanced Biomedical Data Science for Biomedical Engineering [talk] 2023
  Fairness in Machine Learning
- Bern Interpretable AI Symposium [poster] 2023
  Shapley Values and Hypothesis Testing

- QMUL Intelligent Sensing Winter School [talk] 2022
  Shapley Values and Hypothesis Testing
- SIAM Conference on Mathematics of Data Science [talk] 2022
  Interpreting ML Models with Shapley Values
- BMES Annual Meeting [poster] 2019
  Perturbing Force Dependent Vinculin-α-Actinin Binding Impacts Vinculin Tension
- 6th Annual North Carolina Biosciences Collaborative Research Symposium [poster] 2018
  Studying Interactions Between Vinculin Tension and α-Actinin Localization to Focal Adhesions
- Duke School of Medicine Clinical Research Day [poster] 2018
  Using Machine Learning to Predict Schizophrenia Admittance

SKILLS

Coding Languages: Python, MATLAB, R

Libraries: PyTorch, Tensorflow, Scikit-learn