

Asadullah Hill Galib

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As a Ph.D. in Computer Science (ML), I offer a strong background in Software Engineering coupled with a proven track record of multi-disciplinary research collaboration. ([Link: Explore the avenues of Machine Learning and AI I have worked on](#))

Education

Ph.D. in Computer Science

August 2020 - July 2024

Michigan State University, MI, USA

Advisor: [Pang-Ning Tan](#); Domain: Predictive and Generative Modeling, Time Series/Spatiotemporal ML, Representation Learning

M.Sc. in Software Engineering

January 2019 - December 2020

University of Dhaka, Dhaka, Bangladesh

Thesis: Significant Features Analysis For Android Malware Detection Using Machine Learning Techniques [[Manuscript](#)][[Code](#)]

B.Sc. in Software Engineering

November 2014 - December 2018

University of Dhaka, Dhaka, Bangladesh

Technical Skills (* PROFICIENT)

AI/ML Skills*: Generative AI, Representation Learning, Forecasting, Timeseries/Spatiotemporal ML, Data Mining, Adversarial ML, Interpretable/Explainable AI, Large Language Models (LLMs), NLP, Stable Diffusion, OpenAI API, Reinforcement Learning

AI/ML Tools: PyTorch*, Lightning*, Captum*, SK-learn*, Pandas*, NumPy*, Matplotlib*, Anaconda*, MATLAB, Keras

CS Skills: Python*, Java, C*, PHP, JavaScript, Android*, GCP*, MySQL, SQLite, React Native, Laravel, Selenium, Agile, SRS*

Experience

Researcher (Internship), [Frontier Development Lab \(FDL\) 2022](#) by [NASA](#) and the [SETI Institute](#) June 2022 - August 2022

- Carried out a statistical analysis that shows promising links between major earthquakes and ionospheric perturbations.
- Created the first machine learning-ready dataset and statistical tool comprising spatiotemporally varying seismic precursors.
- Built machine learning models for forecasting and detecting earthquakes from heterogeneous multivariate time series data.
- Designed a probabilistic model to learn the spatial variability of ionospheric observations around seismic locations.
- Research outcomes: 3 AGU abstracts, 2 papers, 1 technical memo, and 1 NASA NTR.

Graduate Research Assistant, [Michigan State University \(CSE\)](#)

January 2022 - Present

- Developing novel deep learning algorithms addressing extreme events within spatio-temporal and time series data.

Graduate Teaching Assistant, [Michigan State University \(CSE\)](#)

August 2020 - December 2021

- Lead classes and labs of 260+ students in *CSE 102: Algorithmic Thinking and Programming (Python)*

Software Engineer & Executive Assistant (Internship), [Brain Station 23](#)

January 2018 - June 2018

- Developed from scratch and maintained a web application and a mobile application, using Laravel Framework, PHP, MySQL, React-Native, Redux-Saga, Android Studio, Postman, and proper version-controlling (Git, SourceTree).

Selected Publications ([FULL LIST](#))

Authored **10** peer-reviewed publications, leading as the first author on **6** of them. Presented findings at prestigious international conferences including **KDD (twice)**, **NeurIPS**, **IJCAI (twice)**, **ICDM** and **AGU**. Selected publications:

- **DiffusionCF (KDD 2024)**: An explainable AI framework using counterfactual explanations and conditional diffusion to generate informative, realistic, and close counterfactual instances for explaining forecasts of time series extremes.
- **SimEXT (ICDM 2023)**: A representation learning framework for time series extremes that enhances representation learning performance by 1.1%-8.2% and improves the downstream prediction performance by **1.7%-11.6%**. [[Manuscript](#)]
- **Self-Recover (IJCAI 2023)**: A novel self-supervised learning framework for data fusion and imputation in time series data, boosting forecasting performance by **2.5%-10.5%**. [[Manuscript](#)]
- **DeepExtrema (IJCAI 2022)**: A novel framework for forecasting time series extremes with uncertainty estimations that integrates extreme value theory with deep learning techniques, significantly enhancing forecasting performance by **6.5%-16%**. [[Manuscript](#)]

Academic and Research Projects ([FULL LIST WITH DETAILS](#))

- **On the Susceptibility and Robustness of Time Series Models through Adversarial Attack and Defense**: The vulnerability and robustness of several time series models are investigated through adversarial attacks and defense. [[Manuscript](#)][[Code](#)]
- **Predicting GitHub Issues Lifetime using Machine Learning and Topic Modeling (LDA)**: It outperforms the previous approach with a high precision and f1- measure. It extracts distinguishable and comprehensible topics from issues. [[Manuscript](#)].
- **Pre-birth Factors in the Early Assessment of Child Mortality using Machine Learning Techniques**: It achieves an AUC score of 0.947 which outperforms the clinical standards. Also, it assesses the relative importance of the factors. [[Manuscript](#)].
- **LifeBlood**: A GPS-based blood donor finder android app that searches and sorts nearer blood donors. [[Technical Report](#)][[Code](#)]