

Asadullah Hill Galib

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As an AI Research Scientist with a Ph.D. in Computer Science, I bring a robust background in Software Engineering and a proven record of success in multidisciplinary research collaboration. ([Link: Explore my work in Machine Learning and AI](#))

Education

Ph.D. in Computer Science

August 2020 - July 2024

Michigan State University, MI, USA

Advisor: [Pang-Ning Tan](#); Dissertation: Predictive and Generative Modeling of Time Series Extremes [[Details](#)]

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

Experience

AI Research Scientist, [TSMC Technology, Inc.](#)

November 2024 - Present

- Designing and developing advanced AI-driven analytics to enhance critical business intelligence applications at the Artificial Intelligence for Business Intelligence Research (AI4BIR) Center, TSMC.

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

June 2022 - August 2022

- 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.
- Research outcomes: 3 AGU abstracts, 2 papers, 1 technical memo, and 1 NASA NTR.

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

January 2022 - July 2024

- 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).

Technical Skills (* PROFICIENT)

AI/ML Skills*: Generative AI, Representation Learning, Forecasting, Timeseries/Spatiotemporal ML, Adversarial ML, Large Language Models (LLMs), NLP, OpenAI API, Interpretable/Explainable AI, Reinforcement Learning, Cloud Computing, MLOps

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

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

Selected Publications ([FULL LIST](#))

Authored **11** papers in top-tier AI/ML conferences (**NeurIPS (twice)**, **KDD (twice)**, **IJCAI (twice)**, **ICDM**). Selected ones:

- **Galib, A. H.**, Tan, P. N., & Luo, L. FIDE: Frequency-Inflated Conditional Diffusion Model for Extreme-Aware Time Series Generation. **NeurIPS 2024**. (*Introduces a novel approach that preserves extreme values in time series generation.*)
- **Galib, A. H.**, Tan, P. N. & Luo, L. (2023, Dec.). SimEXT: Self-supervised Representation Learning for Extreme Values in Time Series. **ICDM 2023**, IEEE. (*Improves representation learning by 1.1%-8.2% and downstream prediction by 1.7%-11.6%.*)
- **Galib, A. H.**, McDonald, A., Tan, P. N. & Luo, L. (2023, Aug.). Self-Recover: Forecasting Block Maxima in Time Series from Predictors with Disparate Temporal Coverage using Self-Supervised Learning. **IJCAI 2023**. (*Improves forecasting by 3%-10%.*)
- **Galib, A. H.**, McDonald, A., Wilson, T., Luo, L., & Tan, P. N. (2022, Jul.). DeepExtrema: A Deep Learning Approach for Forecasting Block Maxima in Time Series Data. **IJCAI 2022**. (*Enhances forecasting by 6.5%-16%.*)

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](#)]