

# Asadullah Hill Galib

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

## Education

**Ph.D. in Computer Science** *August 2020 - July 2024 (Expected)*

Michigan State University, MI, USA

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

**B.Sc. in Software Engineering** *November 2014 - December 2018*

University of Dhaka, Dhaka, Bangladesh

## Technical Skills (\* PROFICIENT)

**Programming Languages:** Python\*, Java, C, C++, PHP, JavaScript, Assembly

**AI & Machine Learning:** PyTorch\*, Lightning\*, SK-learn\*, Pandas\*, NumPy\*, Matplotlib\*, Anaconda\*, MATLAB, Keras

**Miscellaneous:** Android\*, GCP\*, MySQL, Oracle, SQLite, jQuery, React Native, Laravel, Selenium, Git\*, Agile, MVC, SRS\*

## Experience

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

- Collaborated with a cross-disciplinary team on the NASA challenge: Seismic Insight from Geomagnetic and Ionospheric Data.
- Carried out a statistical analysis which 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*

- Contributing to the NSF project - [Prediction and Characterization of Extreme Events in Spatio-Temporal Data](#).
- 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 Developer & 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).
- Analyzed requirement specification and design of an existing system for re-engineering. Analyzed two e-commerce frameworks.

## Selected Publications(\* EQUAL CONTRIBUTION)

- Cullen\*, L., Smith\*, A. W., **Galib\*, A.H.**, Varshney\*, D., Brown, E., Chi, P. J., ... & Svoboda, F. (2024, Jan.). A Global Analysis of Pre-Earthquake Ionospheric Anomalies. [arXiv preprint arXiv:2401.01773](#).
- **Galib, A. H.**, Tan, P. N. & Luo, L. (2023, Dec.). SimEXT: Self-supervised Representation Learning for Extreme Values in Time Series. In Proceedings of the 23rd IEEE International Conference on Data Mining, **ICDM 2023**, (pp. 1031-1036), IEEE.
- **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. In Proceedings of the Thirty-Second International Joint Conference on Artificial Intelligence, **IJCAI 2023** (pp. 3723-3731).
- Cullen\*, L., **Galib\*, A. H.**, Smith\*, A. W., Varshney\*, D., Brown, E., Chi, P., ... & Svoboda, F. (2022, Dec.). Can We Forecast And Detect Earthquakes From Heterogeneous Multivariate Time Series Data? In I Can't Believe It's Not Better Workshop: Understanding Deep Learning Through Empirical Falsification. (**ICBINB@ NeurIPS 2022**).

- Cullen\*, L., **Galib\*, A.H.**, Smith\*, A. W., Varshney\*, D., Brown, E., Chi, P. J., ... & Svoboda, F. (2022, Dec.). Open-Source Data Pipelines and Statistical Tool for Studying Pre-Seismic and Post-Seismic Disturbances in the Ionosphere and Geomagnetic Field. In **AGU Fall Meeting Abstracts** (Vol. 2022, pp. IN25A-07).
- Cullen\*, L., **Galib\*, A.H.**, Smith, A. W., Varshney, D., Brown, E., Chi, P. J., ... & Svoboda, F. (2022, Dec.). Comprehensive Statistical Analysis of Ionospheric and Geomagnetic Signatures Before and After Earthquakes. In **AGU Fall Meeting Abstracts** (Vol. 2022, pp. NH13A-04).
- Varshney\*, D., Cullen\*, L., **Galib\*, A.H.**, Smith, A. W., Brown, E., Chi, P. J., ... & Svoboda, F. (2022, Dec.). Multimodal Machine Learning for Earthquake Identification and Forecasting. In **AGU Fall Meeting Abstracts** (Vol. 2022, pp. INV44A-05).
- Wilson, T., McDonald, A., **Galib, A. H.**, Luo, L., & Tan, P. N. (2022, Aug.). Beyond Point Prediction: Capturing Zero-Inflated & Heavy-Tailed Spatiotemporal Data with Deep Extreme Mixture Models. In **Proceedings of the 28th ACM SIGKDD 2022 Conference on Knowledge Discovery and Data Mining** (pp. 2020-2028).
- **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. In **Proceedings of the Thirty-First International Joint Conference on Artificial Intelligence, IJCAI 2022** (pp. 2980-2986).
- **Galib, A. H.**, & Bashyal, B. (2022, May.). On the Susceptibility and Robustness of Time Series Models through Adversarial Attack and Defense. [arXiv preprint arXiv:2301.03703](#).
- Wilson, T., Tan P., Luo, L., & Galib, A. (2021, Dec.). Deep Learning With Extreme Value Theory for Modeling Precipitation Events. In **AGU Fall Meeting Abstracts** (Vol. 2021, pp. A15Q-07).
- **Galib, A. H.**, & Hossain, B. M. (2020, Jul.). Significant API Calls in Android Malware Detection (Using Feature Selection Techniques and Correlation-Based Feature Elimination). In **Proceedings of the 32nd International Conference on Software Engineering Knowledge Engineering (SEKE 2020)** (pp. 566-571).
- **Galib, A. H.**, & Hossain, B. M. (2019, Dec.). A Systematic Review on Hybrid Analysis using Machine Learning for Android Malware Detection. In **2019 2nd International Conference on Innovation in Engineering and Technology (ICIET 2019)**.
- **Galib, A. H.**, & Hossain, B. M. (2020, Jul.). A Review on Hybrid Analysis using Machine Learning for Android Malware Detection. In **Dhaka University Journal of Applied Science and Engineering (DUJASE)**, Volume 5, Issue 1&2, pp. 49-55.
- Yasir, R. M., Asad, M., **Galib, A. H.**, Ganguly, K. K., & Siddik, M. S. (2019, May). GodExpo: an automated god structure detection tool for Golang. In **Proceedings of the 3rd International Workshop on Refactoring (IWOR 2019)** (pp. 47-50). IEEE.
- **Galib, A. H.**, Nahar, N., & Hossain, B. M. (2020). The Influences of Pre-birth Factors in Early Assessment of Child Mortality using Machine Learning Techniques. [arXiv preprint arXiv:2011.09536](#).

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

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- **Predicting GitHub Issues Lifetime using Machine Learning and Topic Modeling (LDA):** It outperforms the previous approach with high precision and f1- measure. Also, it extracts distinguishable and comprehensible topics from issues. [Manuscript](#).
- **Analyzing co-authorship network: Centrality Measure, Link Prediction, and Community Detection:** It analyzes a network of co-authorship relations, predicts missing links and detects community using the network modularity algorithm.
- **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](#).
- **Optimizing Search Space in Code Smells Detection using a Novel Metric:** Significantly reducing search space (i.e., 93% to 21%) using a novel metric called - NCPC, while maintaining the performance of code smells detection. [Manuscript](#).
- **Image-to-Image Translation using Conditional GAN:** It generates colored images from sketches using a generative model - Conditional GAN. It incorporates the architecture and guidelines proposed by a CVPR 2017 study ([Isola et al.](#)).
- **LifeBlood:** A GPS-based blood donor finder android app that sorts out nearer blood donors across the map. In addition, a user rating system, a review system and profiling of donors are being implemented.
- **AutoPilot-Web:** A web-based digital transformation of BTS (Base transceiver station) management. Its purpose is to optimize and automate the existing network management system.
- **AutoPilot-Mobile:** A mobile application (iOS and Android) for the digital transformation of BTS (Base transceiver station) management.

#### Leadership Activities

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**Organizer,** First Software Industry-Academia Collaboration Session with 10 leading companies (2017), Boot Camp on technology for peace, Seminar on the fourth industrial revolution, Workshops on secured internet protocol and IT awareness for females.

**Vice President & Treasurer,** IIT Software Engineers' Community, University of Dhaka.

**Editor & Author,** [Shoshikkha](#) - A web-based knowledge platform in Bengali & English.