

# Samiul Alam

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*"Perpetually Convalescent: Learning & Evolving"*

## RESEARCH INTERESTS

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On-Device AI, Foundation Models, Federated Learning, Distributed ML, Large Language Models.

## WORK EXPERIENCE

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### Ohio State University

Columbus, Ohio

GRADUATE RESEARCH ASSOCIATE

Aug 2023 - Present

- Formulating novel techniques for on-device AI, model compression, and quantization.
- Formulating novel retrieval system using deep hashing and efficient similarity search.
- Collaboration with Meta's Surreal Team for making efficient Multimodal LLM.

### Google

Mountain View, California

SOFTWARE ENGINEERING INTERN

May 2025 - August 2025

- Worked on aligning synthetic data generated using large language models to real user data and using it for creating personalized recommender systems.

### Michigan State University

East Lansing, Michigan

RESEARCH ASSISTANT

Jan 2022 - Aug 2023

- Built novel heterogeneity aware distributed federated learning systems.
- Published 5 papers to top conferences/journals (NeurIPS, SenSys, ICASSP, InterSpeech, DMLR).

### University of Houston

Houston, Texas

RESEARCH ASSISTANT

May 2021 - Dec 2021

- Worked on deconvolution, State space modeling, and Bayesian Filters

### Samsung Research and Development Institute, Bangladesh

Dhaka, Bangladesh

ENGINEER I, MOBILE APPLICATIONS

Apr 2018 - May 2021

- Extended BLE interfacing for Samsung's Wearable Apps (iOS and Android).
- Developed Samsung's cloud service SDK.
- Earned Samsung Software Certification (Top 10% of developers).

### Bengali.AI

Dhaka, Bangladesh

CO-FOUNDER

Jan 2018

- Co-founded Bengali.AI, a non-profit for open-source Bengali datasets and benchmarks for speech and text.

## EDUCATION

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### Ohio State University

Columbus, Ohio

PHD IN COMPUTER SCIENCE AND ENGINEERING

Aug. 2023 - May 2026(Expected)

- Awarded the prestigious OSU University Fellowship

### Michigan State University

East Lansing, MI

MS. IN COMPUTER SCIENCE, GPA: 3.86

Jan. 2022 - Aug 2023

- Thesis focused on federated learning on heterogeneous distributed edge systems.

- Major in Electronics; Minor in Communication
- Awarded Dean's List Distinction in session 2012-2013

## **PUBLICATIONS**

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### **Deep Learning and Generative AI**

- Cheng, Z., Wahnig, S., Gupta, R., **Alam, S.**, et. al. "Benchmarking is Broken - Don't Let AI be Its Own Judge" 39th Conference on Neural Information Processing and Systems (NeurIPS 2025)
- Yang, C., **Alam, S.**, et al. "Reading Recognition in the Wild". 39th Conference on Neural Information Processing and Systems (NeurIPS 2025). [\[Paper\]](#)
- Wang, X., **Alam, S.**, Wan, Z., Shen, H., Zhang, M. "MTL-SVD: Minimizing Singular Value Truncation Loss for Large Language Model Compression. NAACL 2025
- I. Siam, H. Ahn, L. Liu, **S. Alam**, H. Shen, Z. Cao, N. Shroff, B. Krishnamachari, M. Srivastava, and M. Zhang. "Artificial Intelligence of Things: A Survey". ACM Transactions on Sensor Networks 2024
- X. Wang, Z. Wan, A. Hekmati, M. Zong, **S. Alam**, M. Zhang, and B. Krishnamachari, "IoT in the Era of Generative AI: Vision and Challenges". IEEE Internet Computing 2024.
- Wan, Z., Wang, X., Liu, C., **S. Alam**, Zheng, Y., Qu, Z., Yan, S. et al. "Efficient Large Language Models: A Survey." Transactions on Machine Learning Research (2024).
- Zhang, T., Feng, T., **S. Alam**, Dimitriadis, D., Zhang, M., Narayanan, S. S., Avestimehr, S. "GPT-FL: Generative Pre-trained Model-Assisted Federated Learning" arXiv:2306.02210v3.

### **Federated Learning Systems**

- G. Maolin, L. Li, **S. Alam**, L. Liu, L. Liu, M. Zhang, and Z. Cao. "GeoFL: A Framework for Efficient Geo-Distributed Cross-Device Federated Learning" Proceedings of the IEEE International Conference on Computer Communications 2025.
- **Alam, S.**, Zhang, T., Feng, T., Shen, H., Cao, Z., Zhao, D., Ko, J., Zhang, M. "FedAIoT: A Federated Learning Benchmark for Artificial Intelligence of Things." Journal of Data-centric Machine Learning Research (2024).
- Zhang, T., Feng, T., **S. Alam**, Lee, S., Zhang, M., Narayanan, S. S., Avestimehr, S. "FedAudio: A Federated Learning Benchmark for Audio Tasks" 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
- **S. Alam**, Liu, L., Yan, M., Zhang, M. "FedRolex: Model-Heterogeneous Federated Learning with Rolling Sub-Model Extraction" 36th Conference on Neural Information Processing and Systems (NeurIPS 2022). [\[Paper\]](#) [\[Code\]](#)
- Sun, J., Li, A., **S. Alam**, Zhang, M., Li, H., Chen, Y. "FedSEA: A Semi-Asynchronous Federated Learning Framework for Extremely Heterogeneous Devices" 20th ACM Conference on Embedded Networked Sensor Systems. (SenSys 2022).

### **State Space Modelling**

- **S. Alam**, S. Khazaei, Faghih, R. T. "Unveiling productivity: The interplay of cognitive arousal and expressive typing in remote work using multi-state filtering" PLOS ONE 19(5): e0300786.
- M. R. Amin, **S. Alam**, S. Khazaei, H. Fekri Azgomi and R. T. Faghih, "Skin Conductance Response Artifact Reduction: Leveraging Accelerometer Noise Reference and Deep Breath Detection," IEEE Access, vol. 12, pp. 68208-68231.
- **S. Alam**, Amin, M. R., Faghih, R. T. "Sparse Multichannel Decomposition of Electrodermal Activity with Physiological Priors," IEEE Open Journal of Engineering in Medicine and Biology.
- Al-Hussaini, I., Humayun, A. I., **Alam, S.**, Foysal, S. I., ..., Haque, M. A. "Predictive real-time beat tracking from music for embedded application." 2018 IEEE Conference on Multimedia Information Processing and Retrieval (MIPR 2018).

### **Datasets**

- Rakib, F.R., Dip, S.S., **Alam, S.**, Tasnim, N., Shihab, M.I.H., ..., A., Humayun, A.I. "OOD-Speech: A Large Bengali Speech Recognition Dataset for Out-of-Distribution Benchmarking". Proc. INTERSPEECH 2023.

- **Alam, S.**, Reasat, T., Sushmit, A. S., Siddique, S. M., Rahman, F., Hasan, M., Humayun, A. I. “A Large Multi-Target Dataset of Common Bengali Handwritten Graphemes”. International Conference on Document Analysis and Recognition.
- **Alam, S.**, Reasat, T., Doha, R. M., Humayun, A. I. “NumtaDB - Assembled Bengali Handwritten Digits”. arXiv e-prints, arXiv:1806.02452.

## Presentations

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### Meta Aria Summit

RESEARCH

- Presented my work on AR data collection.

Redmond, WA

Feb. 2024

### Master's Thesis Defence

THESIS

- Presented my work for my MS thesis

East Lansing, Michigan

Apr. 2023

### Neural Information Processing and Systems 2022

POSTER PRESENTATION

- Presented my paper at one of the most prestigious venues for computer science

New Orleans, LA

Dec. 2022

### Google Workshop on Federated Learning

POSTER PRESENTATION

- Presented my work on Federated learning at Google's Workshop

Remote

Jul. 2022

## AWARDS

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### 2024 Best Paper Award

IEEE INTERNET COMPUTING

Awarded 2024 Best Paper Award from IEEE Internet Computing for the paper "The Internet of Things in the Era of Generative AI: Vision and Challenges," by the IEEE Computer Society Publications Board. [\[Link\]](#)

Aug, 2024

AIoT-MLSys Lab

### July 2022 Community Competition Creator Prize

KAGGLE

Awarded the Community Competition creator prize by Kaggle for collecting data and organizing the speech transcription competition 'DL Sprint' collaboratively with BUET CSE department.

July, 2022

Bengali.AI

### SEMI FINALIST

INTERNATIONAL FUTURE ENERGY CHALLENGE 2017

Designed, simulated and prototyped a high efficiency, high density DC/DC converter as part of International Future Energy Challenge 2017(IFEC 2017) with a 7-member team. [\[Link\]](#)

MARCH 26, 2017

Team BUET

### HONORABLE MENTION

IEEE SIGNAL PROCESSING CUP 2017

Designed a real time musical beat tracking system in Raspberry Pi and tested various methods including dynamic programming and neural networks as part of IEEE Signal Processing Cup 2017 (SP-Cup 2017) with an 8-member group. [\[Link\]](#)

MARCH 5, 2017

Team Impulse

### CATEGORY WINNER

IEEE MAKER PROJECT 2016

Built a 3D- scanner with the purpose of enabling young innovators to learn 3D design and printing. Became category winner under 'Education' in IEEE Maker Project 2016. [\[Link\]](#)

NOVEMBER 11, 2016

## PROJECTS

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### LLM based AR assistant

AIoT-MLSys LAB@OSU

Developing a virtual assistant that uses a on-device retriever to index and search AR device data and retrieve relevant segments for use by a multimodal LLM on the cloud.

Ph.D. Thesis

Jan 204 - Present

### Aria Eye Tracking Dataset

AIoT-MLSys LAB@OSU

Developing multimodal LLM benchmark and dataset for eye tracking enhanced video understanding applications.

Ph.D. Research

Nov 2023 - Present

### SVD-LLM Model Compression

AIoT-MLSys LAB@OSU

Worked on a singular value decomposition-based model compression technique for deployment on Jetson devices as well as on mobile devices utilizing ONNX runtime, MLC LLM, and TVM compiler.

Ph.D. Research

Aug 2023 - Present

### Federated Learning for Heterogeneous Edge Devices

MLSys LAB LED BY PROF. MI ZHANG AT MSU

Lead a project on developing a federated learning framework to enable model-heterogeneous federated learning on IoT devices with heterogeneous networking bandwidth as well as computational and memory resources.

MS. Research Project

2022 - 2023

**Predicting Generalization in Deep Learning**

PGDL COMPETITION, NEURIPS

NeurIPS Workshop

2020

Developed a method to predict generalization in neural networks. More details about the competition can be found [here](#) and the leaderboard can be seen [here](#)

**5G Smart Router Interfacing**

SAMSUNG RESEARCH

Commercial Project

2020

Worked on interfacing for 5G smart router project and developed its AR capabilities that included showing mesh network strength and optimum router placement.

**Hand Gesture Recognition System**

IEEE PROJECT SHOW

Daffodil Univesrity

September, 2016

Hand gesture recognizer, uses spatial & central moments of convex hull of a hand [\[Code\]](#)

**Industrial Robotic Arm Prototype**

CONTROL SYSTEM I LABORATORY

EEE 402

2015-2016

Built a prototype robotic arm as control systems lab project. Arm had a parallel delta structure and was modeled after similar arm structures used in pick and place machines.[\[Video\]](#) [\[Code\]](#)