

Samiul Alam

PHD STUDENT, OHIO STATE UNIVERSITY

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"Perpetually Convalescent: Learning & Evolving"

RESEARCH INTERESTS

On-Device AI, Multimodal Foundation Models, Egocentric Vision, Distributed Systems.

WORK EXPERIENCE

Ohio State University

Columbus, Ohio

GRADUATE FELLOW

Aug 2023 - Present

- Formulating novel techniques for on-device privacy-preserving ML and personalization.
- Collaboration with Meta's Surreal Team on Multimodal LLM.

Michigan State University

East Lansing, Michigan

RESEARCH ASSISTANT

Jan 2022 - Aug 2023

- Built novel heterogeneity aware distributed federated learning systems.
- Published 4 papers to top conferences (NeurIPS, SenSys, ICASSP, InterSpeech).

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 - Present

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

EDUCATION

Ohio State University

Columbus, Ohio

PHD IN COMPUTER SCIENCE AND ENGINEERING

Aug 2023 - Jul 2025

- Transferred to OSU from MSU with lab. Currently in **3rd** year.
- Awarded prestigious OSU University Fellowship.

Michigan State University

East Lansing, MI

MS. IN COMPUTER SCIENCE AND ENGINEERING, GPA:**3.86**

Jan 2022 - Jul 2025

SKILLS

Deep Learning Jax, PyTorch, TFLite, ONNX Runtime, Ray, Flower, FedML.

Hardware Platforms Jetson, Raspberry Pi, Mobile, Meta Aria Glasses.

Data Visualization Bokeh, Altair, WandB, Dash.

Software Development Android, iOS, Flask.

Coding Python, Kotlin, Swift, C/C++, Java.

PUBLICATIONS

Generative AI

- Wang, X., Wan, Z., Hekmati, A., Zong, M., **Alam, S.**, Zhang, M., Krishnamachari, B. (2024). IoT in the Era of Generative AI: Vision and Challenges. arXiv preprint arXiv:2401.01923.
- 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

- **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." arxiv:abs/2310.00109.
- Zhang, T., Feng, T., **S. Alam**, Lee, S., Zhang, M., Narayanan, S. S., Avestimehr, S. "FedAudio: A Federated Learning Benchmark for Audio Tasks" In 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" In 36th Conference on Neural Information Processing and Systems (NeurIPS 2022). Dec 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" In 20th ACM Conference on Embedded Networked Sensor Systems. (SenSys 2022), Nov 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," in IEEE Access, vol. 12, pp. 68208-68231.
- **S. Alam**, Amin, M. R., Faghih, R. T. "Sparse Multichannel Decomposition of Electrodermal Activity with Physiological Priors," in IEEE Open Journal of Engineering in Medicine and Biology, doi: 10.1109/OJEMB.2023.3332839.
- Al-Hussaini, I., Humayun, A. I., **Alam, S.**, Foysal, S. I., ..., Haque, M. A. "Predictive real-time beat tracking from music for embedded application." In 2018 IEEE Conference on Multimedia Information Processing and Retrieval (MIPR). IEEE, Apr 2018.

Language datasets for Bengali

- Rakib, F.R., Dip, S.S., **Alam, S.**, Tasnim, N., Shihab, M.I.H., Ansary, M.N., Hossen, S.M., Meghla, M.H., Mamun, M., Sadeque, F., Chowdhury, S.S., Reasat, T., Sushmit, A., Humayun, A.I. "OOD-Speech: A Large Bengali Speech Recognition Dataset for Out-of-Distribution Benchmarking". Proc. INTERSPEECH 2023, 879-883, doi: 10.21437/Interspeech.2023-2585
- **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". In International Conference on Document Analysis and Recognition, Sept 2021.
- **Alam, S.**, Reasat, T., Doha, R. M., Humayun, A. I. "NumtaDB - Assembled Bengali Handwritten Digits". arXiv e-prints, arXiv:1806.02452, Jun 2018.

ONGOING PROJECTS

Egocentric AI

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