Samiul **Alam**

samiul272 | samiul-alam | samiul272

"Perpetually Convalescent: Learning & Evolving"

RESEARCH INTERESTS

Edge AI, Federated Learning, IoT, Mobile Computing, Wireless Networking

EDUCATION

Michigan State University *East Lansing, MI*

PhD in Computer Science and Engineering, GPA: 3.75 *Jan. 2022*

- I joined MLSys lab under supervision of Prof. Mi Zhang.
- Current research focus on Edge AI with a specific focus on federated learning on heterogeneous distributed edge systems.

University of Houston *Houston, Texas*

PhD in Electrical and Computer Engineering, GPA: 3.78 *Aug. 2020 -Dec. 2021*

- Worked in Computational Medicine Lab under Prof. Rose Faghih.
- Research focus on modelling human emotion with state space models.

Bangladesh University of Engineering and Technology (BUET) *Dhaka, Bangladesh*

B.Sc. in Electrical and Electronic Engineering, GPA: 3.67 *Feb. 2013 - Sept. 2017*

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

WORK EXPERIENCE

Samsung Research, Bangladesh *Dhaka, Bangladesh*

Engineer I, Mobile Applications *April 2018 - May 2021*

- Worked on Samsung's Wearable App.
- Developed controller app for Samsung's 5G smart router.
- Developed SDK for interfacing Samsung's cloud service.
- Earned Professional Certification in Samsung's software certification exam.

PUBLICATIONS

- **Samiul Alam**, Luyang Liu, Ming Yan, Mi Zhang. "FedRolex: Model-Heterogeneous Federated Learning with Rolling Submodel Extraction" Under review.
- Chenning Li, **Samiul Alam**, Mi Zhang, Zhichao Cao. "DeFL: Communication-Efficient Decentralized Federated Learning with Slice-Server Architecture" Under preparation.
- Jingwei Sun, Ang Li, **Samiul Alam**, Mi Zhang, Hai Li, Yiran Chen. "SacFL: A Semi-Asynchronous Communication Protocol for Efficient and Scalable Federated Learning" Under preparation.
- **Samiul Alam** , Tahsin Reasat , Asif Shahriyar Sushmit , Sadi Mohammad Siddique, Fuad Rahman , Mahady Hasan , Ahmed Imtiaz Humayun. "A Large Multi-Target Dataset of Common Bengali Handwritten Graphemes". In International Conference on Document Analysis and Recognition, Sept 2021
- Irfan Al-Hussaini, Ahmed Imtiaz Humayun, **Samiul Alam**, Shariful Islam Foysal, Abdullah Al Masud, Arafat Mahmud, Rakibul Islam Chowdhury, Nabil Ibtehaz, Sums Uz Zaman, Rakib Hyder, Sayeed Shafayet Chowdhury, and Mohammad Ariful

Haque. "Predictive real-time beat tracking from music for embedded application." In *2018 IEEE Conference on Multimedia Information Processing and Retrieval (MIPR)*. IEEE, Apr 2018.

PROJECTS

Federated Learning for Heterogeneous IoT Devices
MLSys Lab led by Prof. Mi Zhang at MSU — *2022 - Present*
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.

Predicting Generalization in Deep Learning — *NeurIPS Workshop*
PGDL Competition, NeurIPS — *2020*
Developed a method to predict generalization in VGG like or Network in Network models. My approach was ranked 7th in the workshop and I was invited to give a presentation on my work. More details about the competition can be found here and the leaderboard can be seen here

5G Smart Router Interfacing — *Commercial Project*
Samsung Research — *2020*
Worked on interfacing for 5G smart router project and developed its AR capabilities that included showing mesh network strength and optimum router placement.

Voice Enhancement via Audio Visual Input — *Proof of Concept Project*
Samsung Research — *2018*
Developed a prototype voice enhancement system that could enhance noisy audio during video calls/ messages by analyzing the video. Currently being reviewed for patent application.

SKILLS

Deep Learning	In-depth knowledge on statistics, machine learning, and deep learning; Worked extensively with PyTorch, TensorFlow, and Keras; Familiar with R.
Hardware Platforms	Worked on Raspberry pi to deploy machine learning based real time musical beat detection algorithm. Also worked on Arduino, Atmel microprocessors and dsPIC microcontrollers to develop hardware projects.
Computer Vision	Worked with openCV to detect facial landmarks and object recognition. Developed YOLO, RCNN and FRCNN algorithms on Tensorflow.
Data Visualization	Worked on both text and numerical data using Python using pandas, bokeh and dash.
Data Processing	Good knowledge on Normalized Database Design using SQL query; Proficient in using pyspark and dask for situations needing complex analyses and data ingestion. Can deploy data pipelines with AWS EMR.

ENGLISH SCORES

GRE Scores Quant: 170, Verbal: 162, AWA: 3.5

TOEFL Scores Overall: 117 ‖ Reading: 30, Writing: 29, Listening: 30, Speaking: 28