

EDUCATION

- Present** | **Georgia Institute of Technology, Ph.D. in ECE, Atlanta, GA**
Aug 2021
- > Research in Sparsity in Deep Learning, Model Compression, Pruning and Sparse Federated learning.
 - > Supervised by [Dr. Vince Calhoun](#) and [Dr. Sergey Plis](#).
 - > CGPA : 4.0/4.0
- Aug 2021** | **Georgia Institute of Technology, Master's in ECE Program, Atlanta, GA**
Aug 2019
- > Research in Sparse Neural Networks and Neural Network Pruning.
 - > CGPA : 4.0/4.0

PROFESSIONAL EXPERIENCE

- Aug 2022** | **FAIR at [Meta AI](#) : Fundamental (previously Facebook) AI Research**
May 2022 | **Research Scientist Intern, Menlo Park, CA**
- > Designed and implemented a git-like library for version control and compression of neural network weights, which was integrated as part of the open-source [facebookresearch/fairscale](#) library.
 - > Research on extreme sparsity in deep learning models using signal processing based techniques (e.g. FFT and DCT) during training.
- [Sparse Neural Networks](#) [Model Compression](#) [Model Pruning](#) [Efficient AI](#) [Signal Processing](#) [Research](#)
- April 2018** | **BAT Bangladesh**
Oct 2017 | **Team Leader, Full Time, Dhaka, Bangladesh**
- > Was one of the 4 Team Leaders in the Primary Manufacturing Department (PMD) in one of Bangladesh's largest production factories.
 - > Learned project management and data analysis in a large-scale multinational corporation by leading a group of over 80 Engineers, Technicians and Staffs.
- [Project Management](#) [Team Leader](#) [Data Driven Decision Making](#)

RESEARCH EXPERIENCE

- Present** | **Sparsity in Deep Learning, Model Compression and Pruning**
Aug 2019 | **Graduate Research Assistant, [TReNDS](#) - A Joint Georgia Tech, GSU and Emory University Center, Atlanta, GA**
- > Developed a novel Group Sparse Projection algorithm.
 - > Sparse training and benchmarked MLPs and large CNN based models on vision datasets including ImageNet.
 - > Models pruned even in the extreme sparsity range (> 90%) retained close to baseline accuracy.
 - > Work published in TMLR.
- [Model Compression](#) [Sparse Deep Learning](#) [Computer Vision](#) [Neural Network Pruning](#) [PyTorch](#) [NumPy](#) [Distributed Training](#)
- Present** | **Pruning at initialization in Reinforcement Learning and sparse multi-task Learning in RL**
May 2021 | **TReNDS Center, collaboration with [MILA](#), Montreal, CA, Atlanta, GA**
- > Exploring network pruning for offline and online RL tasks before training. Preliminary work accepted at NeurIPS workshop, full work under review.
 - > Exploring new paradigms for multitask RL inspired by techniques from sparse deep learning (under review).
 - > Collaborating with [Dr. Doina Precup](#)'s group at Montreal Institute for Learning Algorithms (MILA).
- [Reinforcement Learning](#) [Network Pruning](#) [Sparsity](#) [Python](#) [PyTorch](#) [NumPy](#)
- Mar 2016** | **Predicting Location of Audio Recordings**
Sep 2015 | **IEEE Signal Processing Cup : Team and Programming Lead IUT, Dhaka, BD**
- > Predicted the location of recording of audio files, exploiting embedded background power signatures from nearby electrical power lines via machine learning techniques.
 - > Led the Islamic University of Technology (IUT) Signal Processing Cup team to 11th rank worldwide and an Honorable Mention in IEEE Signal Processing Cup, 2016.
- [Machine Learning](#) [Signal Processing](#) [Fourier Analysis](#) [FFT](#) [Short Time Fourier Transform](#) [Audio Data](#) [Matlab](#)

</> TECHNICAL STRENGTHS

- > Deep Learning, Machine Learning, Computer Vision, Optimization.
- > Python, C++, Matlab.
- > PyTorch, Numpy, Pandas.
- > Linux, slurm, cluster computing, bash scripting.

RELEVANT COURSEWORK

- Statistical Machine Learning
- Convex Optimization
- Linear Algebra
- Advanced DSP
- Fourier Analysis
- Advanced Programming Techniques
- Information processing in Neural Systems

PROJECTS

WEIGIT : A GIT-LIKE NEURAL NETWORK MODEL-WEIGHT TRACKING LIBRARY

2022

[github.com/https://github.com/facebookresearch/fairscale](https://github.com/facebookresearch/fairscale)

- > Designed & implemented a git-like model weight tracking library for tracking the changes of model weights during training.
- > Provides a git like cli and api for easy integration to training scripts.
- > Implemented compression for weight leveraging FFT and data deduplication.

Software Engineering Open Source Contribution SW Design library implementation Compression

DRONE SIMULATION USING OPENGL AND OPENMPI

2019

github.com/riohib/UAV-Simulation-OpenGL-OpenMPI

- > A C++ implementation of flight simulation for a pack of drones following physics mechanics equations.
- > Flight path was not explicitly programmed, but was constrained and used laws of physics for navigation.
- > Graphics was rendered using OpenGL on C++.
- > Each drone physics was handled by a separate compute node and all drones were coordinated among nodes using OpenMPI.

C++ OpenGL OpenMPI Physics Simulation Graphics

ENF DATA ACQUISITION AND ANALYSIS :

2016

github.com/riohib/IEEE-SP-Cup-2016

- > Collected 10 hours of Electric Network Frequency (ENF) data from the Bangladesh Power Grid.
- > Analyzed data using Fourier Analysis and classified with Support Vector Machines.

Machine Learning Fourier Analysis Support Vector Machines Matlab

PUBLICATIONS AND PRE-PRINTS

- 2023 Samin Yeasar, **Riyasat Ohib**, Sergey Plis and Doina Precup. *Multitask Sparse Reinforcement Learning*. [under review].
- 2023 **Riyasat Ohib**, Bishal Thapaliya, Pratyush Reddy, Jingyu Liu, Vince Calhoun and Sergey Plis. *SalientGrads : Sparse Models for Communication Efficient and data aware Distributed Federated Training*. **ICLR Sparse Neural Networks workshop, 2023**. [coming soon].
- 2022 **Riyasat Ohib**, Nicolas Gillis, Niccolo Dalmaso, Vamsi Potluru and Sergey Plis. *Explicit Group Sparse Projection with applications to Deep Learning and NMF*. **Transactions on Machine Learning Research (TMLR), 2022**. [webpage](#)
- 2021 Samin Yeasar, **Riyasat Ohib**, Sergey Plis and Doina Precup. *Single-Shot Pruning for Offline Reinforcement Learning*. **NeurIPS Offline Reinforcement Learning workshop, 2021**. [paper](#) [webpage](#)
- 2021 **Riyasat Ohib**, Nicolas Gillis, Sameena Shah, Vamsi Potluru, Sergey Plis. *Grouped Sparse Projection for Deep Learning*. **ICLR Hardware Aware Efficient Training workshop, 2021**. [paper](#) [webpage](#)
- 2018 **Riyasat Ohib**, Samin Arnob, Muhtady Muhaisin, Riazul Arefin, Taslim Reza and MR. Amin. *ENF Based Machine Learning Classification for origin of Media Signals : Novel Features from Fourier Transform Profile*. **Accepted at ICEECS 2018** presented on Nov 13-14, 2018.
- 2017 Samin Yeasar, **Riyasat Ohib**, and Muhtady Muhaisin. *Power file extraction process from Bangladesh grid and exploring ENF based classification accuracy using machine learning*. **IEEE R10HTC Conference, 2017**. [paper](#)
- 2016 **Riyasat Ohib**, Samin Yeasar Arnob, Md Sayem Ali, Rakibul Hasan Sagor, and Md Ruhul Amin. *Metal nanoparticle enhanced light absorption in Ga-As thin-film solar cell*. **IEEE Asia-Pacific Conference on Applied Electromagnetics**, pages 89–93, 2016. [paper](#)

HONORS AND AWARDS

- 2019 **DLRLSS 2019** : Selected for funding by the Canadian Institute for Advanced Research (CIFAR) and Alberta Machine Intelligence Institute (Amii) for the **Deep Learning and Reinforcement Learning Summer School (DLRLSS) 2019** at Edmonton, Canada.
- 2013-17 **Undergraduate Honor's List** at IUT
- 2013-17 **OIC Scholarship** : Recipient of the Organisation of Islamic Cooperation scholarship. Included a monthly stipend and full Tuition waiver during the whole duration of undergraduate studies.