

EDUCATION

Florida State University, Tallahassee, Florida
Ph.D. candidate, Computer Science, currently enrolled, *CGPA 4.00/4.00*
Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
BSc., Computer Science and Engineering, February 2013, *CGPA 3.54/4.00*

RESEARCH
INTERESTS

- **High Performance Computing (HPC) Systems:** HPC I/O Optimization, Heterogeneous Storage Stack, Domain-specific Systems Design, Parallel File Systems, Burst Buffer File Systems, HPC Workflow, Performance Analysis
- **Artificial Intelligence:** Deep Learning at Scale, Reinforcement Learning

RESEARCH
EXPERIENCE

Department of Computer Science, Florida State University
Graduate Research Assistant **August 2017 - Present**
- Ph.D. student researcher at *Computer Architecture and SysTems Research Lab (CASTL)* supervised by *Professor Dr. Weikuan Yu*
Center for Applied Scientific Computing (CASC), Lawrence Livermore National Laboratory (LLNL)
Student Intern **May 2019 - August 2019**
- Worked on optimizing I/O strategies in cutting-edge HPC application workflows as a summer intern in the *Data Analysis Group* at CASC. Published a research poster at SC'19.
National Energy Research Scientific Computing Center (NERSC), Lawrence Berkeley National Laboratory (LBNL), Berkeley, California
Student Assistant **May 2018 - August 2018**
- Worked as a summer intern in the *Data Analytics and Services* group at NERSC on analyzing scalable data pipeline for distributed deep learning. Published a work-in-progress abstract at PDSW-DISCS'18.
NERSC, LBNL
LBNL Affiliate **August 2018 - August 2019**
- Extended the summer internship project on distributed deep learning applications' data pipeline

RESEARCH
PROJECTS

- **HPC Workflow I/O Optimization:** Built an Emulator to analyze different HPC I/O patterns, e.g., Deep Learning Training I/O, Checkpoint/Restart, Producer-Consumer, etc. Developing a middleware to implement optimization strategies for application workflows.
- **BeeGFS Performance Evaluation:** Published a research paper on the performance evaluation of *BeeGFS* parallel cluster file system using different I/O and metadata performance benchmarks, and deep learning applications atop TensorFlow, Horovod and LBANN. Working on analyzing the fitness of *BeeGFS On Demand (BeeOND)* as an ephemeral burst buffer file system.
- **Scalable Data Pipeline for Distributed Deep Learning:** Analyzed and profiled I/O behavior posed by cutting-edge deep learning applications at scale. Pinpointed I/O bottlenecks caused by metadata overhead in DL training. Published the results as a work-in-progress abstract.

PUBLICATIONS

- **F. Chowdhury**, F. Di Natale, A. Moody, E. Gonsiorowski, K. Mohror, and W. Yu. "Understanding I/O Behavior in Scientific Workflows on High Performance Computing Systems," in Proceedings of the *International Conference on High Performance Computing, Networking, Storage and Analysis 2019 (SC19)*, Regular Poster, Nov. 2019.
- **F. Chowdhury**, Y. Zhu, T. Heer, S. Paredes, A. Moody, R. Goldstone, K. Mohror, and W. Yu, "I/O Characterization and Performance Evaluation of BeeGFS for Deep Learning," in Proceedings of the *48th International Conference on Parallel Processing (ICPP 2019)*, 2019.
- **F. Chowdhury**, J. Liu, Q. Koziol, T. Kurth, S. Farrell, S. Byna, Prabhat, and W. Yu, "Initial Characterization of I/O in Large-Scale Deep Learning Applications," in *SC18, 3RD Joint International Workshop on Parallel Data Storage & Data Intensive Scalable Computing Systems (PDSW-DISCS 2018)*, Work-in-progress (WIP) Abstract, Nov. 2018.
- Y. Zhu, **F. Chowdhury**, H. Fu, A. Moody, K. Mohror, K. Sato, and W. Yu, "Entropy-Aware I/O Pipelining for Large-Scale Deep Learning on HPC Systems," in *IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 2018)*, 2018.

TECHNICAL
SKILLS

- Programming Languages: **C/C++**, **Python**, C#, Matlab, Java, Javascript
- Libraries: **MPI**, **HDF5**, BSD sockets, WinSock, Opengl, Boost, Windows API, Google Test
- Frameworks: **TensorFlow**, **Horovod**, **LBANN**, Qt Framework, MFC, .NET Framework
- Distributed File Systems: **BeeGFS**, Lustre, BurstFS, UnifyCR