Fahim Tahmid Chowdhury

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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
Bachelor of Science, Computer Science and Engineering, February 2013, *CGPA* **3.54**/4.00

Research Interests

- **HPC Systems:** HPC I/O Optimization, Heterogeneous Storage Systems, 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**
- Working in *Computer Architecture and SysTems Research Lab (CASTL)* led by *Dr. Weikuan Yu*

Center for Applied Scientific Computing (CASC), Lawrence Livermore National Laboratory (LLNL)
Student Intern **May, 2019 - August, 2019**
- Worked as a summer intern in the Data Analysis Group at CASC on a project for optimizing I/O behavior in HPC workflow

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 a project for analyzing scalable data pipeline for distributed deep learning

NERSC, LBNL
LBNL Affiliate **August, 2018 - August, 2019**
- Continued the summer internship project on distributed deep learning applications' data pipeline

Research Projects

- **HPC Workflow I/O Optimization:** Working on a collaboration project with LLNL for pinpointing HPC I/O issues and optimizing HPC workflow management based on the findings, e.g., DL Training I/O, Checkpoint/Restart, Producer-Consumer, etc.
- **BeeGFS Performance Evaluation:** Serving a collaboration project with LLNL for evaluating the performance of BeeGFS parallel cluster file system using different I/O and metadata performance benchmarks, and Deep Learning applications
- **Scalable Data Pipeline for Distributed Deep Learning:** Worked on a project with NERSC for profiling I/O in the distributed deep learning applications to explore the I/O bottlenecks, and design and implement an optimization strategy to overcome the possible bottlenecks

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)*, 2018. - Work-in-progress (WIP) Abstract
- 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