Fahim Tahmid Chowdhury

CONTACT INFORMATION

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OBJECTIVE

To satisfy the thirst for innovation and add values to the society while building up career in research assisted by engineering acumen

EDUCATION

Florida State University, Tallahassee, Florida
PhD, Computer Science, Currently studying, *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

Notre Dame College, Dhaka, Bangladesh
Higher Secondary Certificate(HSC), Science, 2007, *GPA* **5.00**/5.00

Ispahani Public School and College, Chittagong, Bangladesh
Secondary School Certificate(SSC), Science, 2005, *GPA* **5.00**/5.00

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, Tallahassee, Florida
Graduate Research Assistant **August, 2017 - Present**
Working in ***Computer Architecture and SysTems Research Lab (CASTL)*** under the supervision of *Professor Dr. Weikuan Yu*

Center for Applied Scientific Computing (CASC), Lawrence Livermore National Laboratory (LLNL), Livermore, California
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, Berkeley, California
LBNL Affiliate **August, 2018 - August, 2019**
Continued the summer internship project on distributed deep learning applications' data pipeline

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. ACM, New York, NY, USA, Article 80, 10 pages. DOI: https://doi.org/10.1145/3337821.3337902
- **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.
- Y. Zhu, **F. Chowdhury**, H. Fu, A. Moody, K. Mohror, K. Sato, and W. Yu. "Multi-Client DeepIO for Large-Scale Deep Learning on HPC Systems," in Proceedings of the *International Conference on High Performance Computing, Networking, Storage and Analysis 2018 (SC18)*, Regular Poster, Nov. 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: BurstFS, **UnifyCR**, **BeeGFS**, Lustre, Octopus
- I/O Benchmark Tools: IOR, MDTest, DD, IOZone, Bonnie++
- Profiling Tools: **Darshan**, **TensorFlow Timeline**
- Database Management Systems: MySQL, Oracle, SQL Server
- Design Tools: EDraw, GraphViz, Rational Rose
- Documentation Tools: LaTeX, Doxygen
- Project Management Applications: Jira, Redmine, Mantis, Microsoft Project
- Version Control Systems: Git, Mercurial, SVN
- Operating Systems: Unix/Linux, Windows

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
- **Burst Buffer File System:** Working on a project for enhancing a burst-buffer file system (i.e. UnifyCR) by adding an improved Garbage Collection module.
- **Specialized File System for Large Datasets of Deep Neural Network:** Assisting a collaboration project with LLNL for designing a file system for large datasets of Deep Neural Network by studying the data shuffling mechanism in TensorFlow and Caffe
- **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

Industry Experience

IPvision Canada Inc, Dhaka, Bangladesh
Software Analyst **October, 2016 - July, 2017**
Worked as a member of the development team for developing the SDK of the social networking platform named ***ringID***

Vizrt, Dhaka, Bangladesh
Software Engineer **July, 2014 - September, 2016**
Served as a member of the ***Sports Solutions*** R&D team in Dhaka, mostly worked on ***Viz Libero*** software

Enosis Solutions, Dhaka, Bangladesh
Software Engineer **February, 2013 - June, 2014**
Worked as a member of the development team for ***Visual-Host*** which is an offshore SDK framework of a Computer Aided Engineering(CAE) software ***Visual-Environment***

Undergraduate Thesis

Design of a Surveillance System for Dhaka City, *Graph Drawing and Information Visualization Lab*, CSE, BUET under the supervision of *Dr. Md. Saidur Rahman*

- Designed and simulated an integrated system to monitor and control the traffic system of Dhaka
- Applied different shortest path algorithms on Dhaka city map

- Proposed locations for police-boxes on the prominent road-crossings of Dhaka using 2-Approximation Vertex Cover Algorithm
- Proposed heuristic algorithm that can be applied on clustered map of a large area

Academic Projects

- **F2PUnifyCR:** A Flash-friendly Persistent Burst-Buffer File System implemented on top of UnifyCR
- **Network Text Editor:** A C++ application to facilitating collaborative editing in a LAN
- **CSE Office Management:** An integrated system for automating all the official tasks (i.e. Inventory management, Notice board, Teachers' profile, Peer-to-peer communication etc.) of BUET CSE
- **micro-C Compiler:** A simple compiler implementation for C-like programming language (i.e. micro-C)
- **Automated Water Faucet:** A portable hardware device that can be put on any water tape to control the flow of water automatically by detecting human presence using PIR sensor for avoiding wastage
- **Digital Watch with Timer:** A digital watch with timer developed using ATMEGA 8 Microcontroller
- **LAN Messenger:** A software developed in Java for chatting with the contacts that are in a LAN
- **NACHOS:** Not Another Completely Heuristic Operating System implementation developed in C++
- **Snooker Game:** A two player Snooker game developed in C++
- **Screensaver:** A simple screensaver developed in Assembly Language

Voluntary Experience

- **Student Volunteer at SC'18:** Worked as a student volunteer at the SC'18 (SuperComputing) Conference, the International Conference for High Performance Computing, Networking, Storage, and Analysis in Dallas, Texas, USA, November, 2018.
- **Gaming Application for Differently Abled Children:** A car racing game interfaced with cycling machine for encouraging the Active Range Of Motion Exercise (AROME) for the children having weakness in Quadriceps femoris muscle being conducted in Feroza Bari Disabled Children Hospital
- **Software for ReCAP:** A software for prioritizing the roads and highways by simulating an algorithm that is developed by Department of Urban and Regional Planning, BUET

Community Work

Engineering Students' Association of Bangladesh
A common platform for all the engineering students of Bangladesh
President **October, 2011 - November, 2013**
Pioneered the voluntary association along with a bunch of energetic people and served as the organizational head

Scholarships and Awards

- Student Volunteer Program Scholarship for attending the SC'18 (SuperComputing) Conference, the International Conference for High Performance Computing, Networking, Storage, and Analysis in Dallas, Texas, USA, November, 2018.
- Champion in the Intra-Department Project Competition for the project *CSE Office Management*
- Board Merit Scholarship, HSC Examination
- Board Merit Scholarship, SSC Examination

References

Available upon request