MD ABDUL MOTALEB FAYSAL

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RESEARCH INTEREST

Parallel and Distributed Computing, Machine Architecture, HPC Performance Modeling and Simulation, Graph Algorithms, Community Discovery, Scalable Algorithm Design, Big Data Mining

EDUCATION

University of Nevada, Las Vegas (UNLV), NV *Fall 2022 - Present*
Ph.D. Candidate in Computer Science
Expected Graduation: **Fall 2023**

University of New Orleans (UNO), LA *Fall 2017 - Summer 2022*
Ph.D. Student in Computer Science

University of New Orleans (UNO), LA *Spring 2020*
M.S. in Computer Science
Thesis: Accelerating the Information-Theoretic Approach of Community Detection Using Distributed and Hybrid Memory Parallel Schemes

Bangladesh University of Engineering and Technology (BUET), Bangladesh *July 2014*
B.Sc. in Computer Science and Engineering
Thesis: Content-Based Image Retrieval using Relevance Feedback

WORK EXPERIENCE

Graduate Research Assistant, UNLV *Fall 2022 - Present*
Data-intensive Scalable Computing Group

- Designing parallel algorithm for k-triangle induced local community discovery delivering up to 55× speedup than sequential approach
- Designing scalable algorithms for memory-bound applications capable of processing billion-size sparse network datasets

Graduate Summer Intern/Affiliate, Berkeley Lab (LBNL) *Summer'20, '21, '22, '23*

- Fast community detection in graphs with Infomap method using Accelerated Sparse Accumulation delivering 5.6× performance
- Improved 5× speedup of a billion-size graph clustering application
- Validation of performance portability of Kokkos framework in CPU/GPU
- Identified performance bottleneck of the SpGEMM approach
- Performance modeling of compute kernels in HPC platforms
- Software-hardware co-design in heterogeneous architecture

Graduate Research Assistant, UNO *Fall 2017 - Spring 2022*
Big Data and Scalable Computing Group

- Distributed-memory parallel community detection using an information-theoretic approach delivering up to 5× speedup
- Comparing network visualization tools and analytics

Course Instructor, UNO *Spring '22, Fall '20, Spring '20*
Courses taught:

- Introduction to Programming in C++

- Introduction to Computers
- Machine Structure and Assembly Language Programming

Graduate Teaching Assistant, UNO *Fall 2019*
Course Title: Machine Structure and Assembly Language Programming

Software Engineer *August 2014 - July 2017*
ReliSource, Bangladesh
Role:

- Developed and maintained software solutions for health care management.
- Solved critical software issues hindering throughput in production line
- Developed IoT-based software solution for cold chain management.

PUBLICATIONS

- Md Abdul Motaleb Faysal, Maximilian Bremer, Cy Chan, John Shalf, and Shaikh Arifuzzaman, "Fast Parallel Index Construction for Efficient K-truss-based Local Community Detection in Large Graphs", [just accepted] ICPP 2023
- Md Abdul Motaleb Faysal, Maximilian Bremer, Shaikh Arifuzzaman, Doru Popovici, John Shalf and Cy Chan, "Fast Community Detection in Graphs with Infomap Method using Accelerated Sparse Accumulation", [just accepted] AsHES 2023 IPDPSW
- Md Abdul Motaleb Faysal, Shaikh Arifuzzaman, Cy Chan, Maximilian Bremer, Doru Popovici and John Shalf, "HyPC-Map: A Hybrid Parallel Community Detection Algorithm Using Information-Theoretic Approach", IEEE HPEC 21
- Md Abdul Motaleb Faysal and Shaikh Arifuzzaman, "Distributed Community Detection in Large Networks using An Information-Theoretic Approach", In proc. of 2019 IEEE International Conference on BigData (BigData 2019), pages 4773–4782, IEEE, December 2019
- Md Abdul Motaleb Faysal and Shaikh Arifuzzaman,"Fast Stochastic Block Partitioning using a Single Commodity Machine", In proc. of 2019 IEEE International Conference on BigData (BigData 2019), pages 3632–3639, IEEE, December 2019
- Md Abdul Motaleb Faysal and Shaikh Arifuzzaman, "A Comparative Analysis of Large-scale Network Visualization Tools", In Proceeding of 2018 IEEE International Conference on BigData (BigData 2018), pages 4837–4843, Seattle, WA, USA, IEEE, Dec 2018
- Shaikh Arifuzzaman, Naw Safrin Sattar, Md Abdul Motaleb Faysal, "Parallel Algorithms for Mining Large-scale Time-varying (Dynamic) Graphs" Nov 2018, In PDSW-DISCS Workshop in SC'18, Dallas, TX, USA, Nov 2018
- Naw Safrin Sattar, Md A. M. Faysal, Minhaz Zibran, Shaikh Arifuzzaman, Md Rakibul Islam, "Data Mining in-IDE Activities: Why Software Developers Fail", ISCA 27th International Conference on Software Engineering and Data Engineering, SEDE 2018

TECHNICAL SKILLS

Language	C, C++, Java, C#, LaTeX, Assembly, Python, PHP, Prolog
HPC Frameworks	MPI, OpenMP, CUDA, TAU, Metis, ZSim, Hadoop
Other Frameworks	Ant, JavaFX, JUnit, OpenGL, .NET
RDBMS	MySQL, MSSQL, Oracle
Version Control	Git, SVN, TFS
Others	Intel Pin, Vtune, OSU Benchmark, Amazon AWS, Matlab, Weka

RELEVANT GRADUATE COURSES

Applied Combinatorics & Graph Theory, Parallel & Sci Computing, Concurrent Programming, Cloud Computing, Machine Learning, Advanced Machine Learning, Big Data Analytics and Systems, Categorical Data Analysis, Network Penetration, Agile Software Engineering

SOME PROJECTS

CloudCached: A Distributed Memcached in Cloud

- A distributed Memcached client in Amazon AWS
- Data duplication, data recovery, scaling up, and scaling down of Memcached server instances

Art Man: A Sales Management Software

- A software to manage the sales of artworks
- Developed following the *agile* software development process
- Frameworks used: JavaFX, Junit