MD ABDUL MOTALEB FAYSAL

Homepage faysal@unlv.nevada.edu linkedin.com/faysal101 +1(504)493-1444

RESEARCH INTEREST

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

EDUCATION

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

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

PUBLICATIONS

Publications:

- 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
Operating System	Linux, Windows
Others	Intel Pin, Vtune, OSU Benchmark, Amazon AWS, Matlab, Weka, Shell

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

WORK EXPERIENCE

Graduate Research Assistant, UNLV *Fall 2022 - Present*
Data-intensive Scalable Computing Group
Supervisor: Dr. Shaikh Arifuzzaman
Role:

- Designing distributed algorithm for local community discovery using K-truss decomposition
- Software-hardware co-design in heterogeneous architecture

Graduate Summer Intern, Berkeley Lab (LBNL) *Summer'20, Summer'21, Summer'22*
Role:

- 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
- Identified performance bottleneck of the SpGEMM application at Berkeley Lab

Graduate Affiliate, Berkeley Lab (LBNL) *Fall 2020 - Present*
Exascale Computing Group, **PI:** John Shalf
Role:

- Software-hardware co-design in heterogeneous architecture using ZSim and Intel Pin tool
- Performance modeling of the massive-scale graph and genomics application kernels in HPC platforms
- Validation of theoretical performance models against true performance *roofline* modeling

Graduate Research Assistant, UNO *Fall 2017 - Spring 2022*
Big Data and Scalable Computing Group
Supervisor: Dr. Shaikh Arifuzzaman
Role:

- Categorization and optimization of graph algorithm kernels in heterogeneous architecture
- Hybrid memory parallel Community Detection using an information-theoretic approach
- Stochastic Block Partitioning for temporal/dynamic networks
- Network visualization and analytics

Course Instructor, UNO *Spring 2022*
Course Title: Introduction to Programming in C++
Role:

- Teaching C++ as a high-level programming tool to solve computational problems
- Preparing quizzes, and problem-setting for assignments

Course Instructor, UNO *Fall 2020*
Course Title: Introduction to Computers
Role:

- Introducing computers and computing technologies to students majorly from non-CS background
- Preparing quizzes, problem-setting for assignments, and grading

Course Instructor, UNO *Spring 2020*
Course Title: Machine Structure and Assembly Language Programming
Role:

- Teaching assembly language programming and machine architecture
- Preparing questions for quizzes, problem-setting for assignments
- Grading quizzes, and assignments

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

- Grading quizzes and assignments

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

- Developed and maintained software solutions for health care management.
- Developed IoT-based software solution for the cold chain management.

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

3D Modeling, Simulation, and Animation Using OpenGL

- Drawing 3D models of the mega-structure with lighting and texturing effect
- Simulation of physical properties of 3D objects such as mass, velocity, friction, damping, collision
- Applying animation on 3D object models
- Language and Frameworks: C, OpenGL, glut

Household Protection by Flammable Gas Detection, and SMS Alert

- An embedded application for detecting combustible gas leakage in household gas pipelines
- Provides alarm, switching on an exhaust fan, short message service alert
- C, WinAVR, Atmega16/32 (microcontroller), SIMCOM-300 (GSM module), MQ-5/6 (Sensors)

Electronic Medical Record System

- A full-stack application for Patients record management
- An application for online access to medical records for doctors and patients
- Key Technology Used: PHP, MySQL, CodeIgniter

ACHIEVEMENT & AWARD

- Student Volunteer SC'21, and SC'20
- Secretary, Bangladesh Student Association (BSA), UNO, 2021-22
- Champion, UNO Intramural Table Tennis Tournament, 2019
- 2nd Runner Up, Inter-University Project Competition, BUET, 2013