Jaiaid Mobin

Graduate Research Assistant

Rochester, NY, USA | +15859106251 | jm5071@rit.edu | https://github.com/Jaiaid | https://www.linkedin.com/in/jaiaid-m-9913ba135

https://scholar.google.com/citations?user=ifmzYdsAAAAJ

Summary

I am a 3rd year (ongoing) Ph.D. student. My research focus is workload optimization for GPU and disaggregated data centers. I am interested in getting opportunities to gain more hands-on experience in DDL deployment and optimization in HPC. **As a Ph.D. student** I have published **a poster in A-tier conferences as the first author**, have **collaborated on workshop paper and poster**, and have done **paper and artifact reviews**.

Education

Rochester Institute of Technology — *Rochester, NY, USA*

Ph.D. in Computer Science — *August, 2022 - Present*

- **Research Topic** — *GPU Computing, Continual Training and Inference System*

Bangladesh University of Engineering and Technology — *Dhaka, Bangladesh*

M.Sc. in Computer Science — *August, 2022*

- **Thesis Title** — *Transit Network Design For Evacuation Modeling Using Heuristic and Multi-Objective Optimization Based Approaches*

Bangladesh University of Engineering and Technology — *Dhaka, Bangladesh*

B.Sc. in Computer Science — *September, 2017*

Publications (First Author/Collaborations)

Towards Efficient Python Interpreter for Tiered Memory Systems, *Poster*

USENIX Conference on File and Storage Technologies (FAST), *2024*

`https://par.nsf.gov/biblio/10495018`

COLTI: Towards Concurrent and Co-located DNN Training and Inference, *Poster (Best Poster Award)*

ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC) , *2023*

`https://www.hpdc.org/2023/program/accepted/`

Towards Data Gravity and Compliance Aware Distributed Deep Learning on Hybrid Clouds, *Workshop Article*

Workshop on Data Fabric for Hybrid Clouds, *2022*

`https://hipc.org/wdfhc/`

Multi-objective optimization and heuristic based solutions for evacuation modeling, *Journal Article*

Transportation research interdisciplinary perspectives, *2023*

`https://doi.org/10.1371/journal.pone.0245058`

Efficient association mapping from k-mers—an application in finding sex-specific sequences, *Journal Article*

Plos One, *2021*

`https://doi.org/10.1371/journal.pone.0245058`

Reference-free association mapping from sequencing reads using k-mers, *Journal Article*

Bio-protocol, *2020*

`https://pmc.ncbi.nlm.nih.gov/articles/PMC7842384/`

A heuristic aided Stochastic Beam Search algorithm for solving the transit network design problem, *Journal Article*

Swarm and Evolutionary Computation, *2019*

`https://www.sciencedirect.com/science/article/abs/pii/S2210650218302414`

Professional Experience

Graduate Research Assistant, *January 2024 - Current, August 2022 - May 2023*

Rochester Institute of Technology, Rochester, NY, USA

- Investigate Research Problem
- Study and review research paper

Graduate Teaching Assistant, *August 2023 - December 2023*

Rochester Institute of Technology, Rochester, NY, USA

- Answering Student's queries about homework in office hours or in Discord

Senior Software Engineer, Software Engineer, *July 2018 - April 2022*

BJIT Ltd - Offshore Software Development Company, House-7, Road-2/C, Block-J, Baridhara, Dhaka

- Act as representative of <5 member team.
- Provide initial system design based on client requirement as a representative of small team
- Train newly recruited Engineers
- Reviewed client expectations and project parameters and suggested software packages that met requirements.

Professional Project Experience

Device Interfacing Software Improvement

- Contributed to build and solve issues in building a codebase in **MSVC2019** which is earlier built using **MSVC2012** and clear documentation was not available
- Fixed bug in **C#** codebase and implemented a small feature

Virtual Background Feature Implement

- Used google **mediapipe sdk** to implement library to remove background, add background, blur background (provided as a static library for Windows)
- Library is developed using **C++ (MSVC2017)** for 64bit platform, library using **mediapipe SDK** is partially built using **Bazel** build system.
- Resolved some build issues to build **mediapipe** code using **MSVC2017** (github provided version with the necessary feature can be built only by MSVC2019)

Directshow Source Filter Development

- Repurposed code from existing MIT licensed project to create a source filter
- Analyzed requirement of our project and capabilities of directshow source filter to report what is feasible and accordingly influenced application architecture
- Implemented simple IPC mechanism to facilitate communication between COM component and application
- Worked on application backend to interface with custom source filter using **C++ (MSVC++14)** and **C#(.NET 4.7)**

Device Control Based on Computer Vision

- Developed Windows application using **C++/CLR** and VS2015
- Developed simple custom solutions based on computer vision algorithms using **OpenCV** API to do particular object presence detection for application use case scenario and showed their effectiveness using client provided dataset
- Implemented object detection system in **C++** using **OpenVINO** sdk for **Windows10** based application
- Implemented relay control over tcp in **C++** using windows networking library and knowledge from the relay documentation

Smartphone User Detection

- Collected Data and trained machine learning model inspired from a given paper in **Python3.6** using **numpy, scikit-learn** package
- Implemented simple communication over http protocol locally to connect front end code and backend ml inference using **flask, json** packege

Content Based http/https Traffic Filtering

- Implemented local cache in **C++** using **sqlite** library in **Windows** client PC**(Windows10)**) application
- User can selectively filter categories of content
- Written simple **javascript** for browser based control panel of client PC application

Used Tools

Languages	Python3, C++, C, Java, Bash, SQL, C#, x86 Assembly(fasm)
Machine Learning/Vision Development Tools	OpenCV, Scikit-learn, Keras, PyTorch
DBMS	MySQL, SQLite, PostgreSQL
Build system	Make, CMake, Bazel
Cloud Environment	GCP
CI/CD	Gitlab CI/CD
Hypervisor system	VirtualBox, Linux KVM
Container Deployment	Docker
Cluster Management Toolkit	xCAT
Mobile Platform SDK	Android (https://play.google.com/store/apps/details?id=com.bitweaver.morsetorch)
Network Tool	Wireshark (monitoring), Packettracer (simulation), Postman (API testing)
WebFrameworks	Laravel, Codeogniter
H/W Development Platform	Arduino, Raspberry PI

Achievements and Activities

ACM HPDC'23 Best Poster Award *June, 2023*

- https://twitter.com/ACM_HPDC/status/1671990446174642177/photo/1

Part of BrickHack 9 Best Health Hack Winner Team *February, 2023*

- RIT's premiere collegiate hackathon

ITEE Certification *March, 2018*

- ITEE Level 2, FE Exam
- Organized by IPA, Japan

Review Work *October, 2023 - Present*

- Conference short paper review
- Artifact review