

# Jaiaid Mobin

GRADUATE RESEARCH ASSISTANT

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🏠 <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

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### 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** package

### 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

## Skill Set

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

## Achievements and Activities

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### ACM HPDC’23 BEST POSTER AWARD

June, 2023

- [https://twitter.com/ACM\\_HPDC/status/1671990446174642177/photo/1](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