

Mohammad Sonji

Prospective PhD Student

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↗ My Webpage

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Research Interest

I am broadly interested in Systems, especially: High-Performance Computing, Architecture, and Compilers. My current research focuses at the intersection of Heterogeneous High-Performance Computing and Serverless Computing specifically Function as a Service (FaaS).

Education

2022 - 2023 : **Master of Science, Computer Science, American University of Beirut**

CGPA: 3.7, Advisor: Professor Izzat El Hajj, Thesis title: Predicting If Executing Applications Are Near Completion

2018 - 2021 : **Bachelor of Science, Computer Science, Beirut Arab University**

CGPA: 3.76, Class rank: 3rd, Graduated with honors

Experience

Research

June,2022 - **Research Assistant, American University of Beirut, AUB & Hewlett Packard Labs, HPE**

present : In collaboration with Hewlett Packard Labs (HPE) led by **Dr. Dejan Milojicic** and his team, I worked on multiple research projects related to application performance and execution prediction, GPUs integration for serverless graph processing applications.

Advisor: **Dr. Izzat El Hajj**, Assistant Professor, Department of Computer Science, AUB

Teaching

Teaching Assistant, American University of Beirut, AUB

Fall 23-24 : CMPS221: Computer Organization & Design

Spring 22-23 : CMPS202: Intermediate Programming with Data Structures

Fall 22-23 : CMPS224/CMPS396AA: GPU Computing

Spring 21-22 : CMPS200: Introduction to Programming

CMPS212: Intermediate Programming with Data Structures

Selected Academic Projects

2022 : **GPU Computing**

I designed a CUDA application in C/C++ for computing the Jaccard similarity among vertices in a graph, implementing four distinct versions of the code, each integrating one or more novel optimizations. I was able to achieve the fastest execution time among my classmates.

2022 : **Compiler Construction**

Using the LLVM compiler and its Clang frontend, I implemented the following tasks in C++:

- Source-to-source compiler as a recursive AST visitor in Clang
- Code generator as a non-recursive AST visitor in Clang
- Aggressive Dead Code Elimination optimization.

Technical skills

Parallel, Distributed, & GPGPU Programming: MPI, Pthreads, CUDA

Imperative Programming Languages: C, C++, Python, JAVA, Bash

Logic Programming Languages: Prolog

Functional Programming Languages: Scheme
Operating Systems: Linux/Unix, Windows
Compilers: LLVM
Version Control: Git
Tools: Docker
Cloud: Kubernetes, Knative

Certificates

- 2023 : **Preventing Harassment and Discrimination**, AUB, Title IX
2022 : **Physical Science Responsible Conduct of Research**, AUB, CITI PROGRAM
2022 : **Diversity, Inclusion and Belonging**, AUB, Title IX
2022 : **Sexual Assault Prevention**, AUB, Title IX
2020 : **Lebanese Collegiate Programming Contest**, ACM, LCPC
2020 : **Internet and Computing Core Certification (IC3)**, Certiport Inc.
2019 : **Lebanese Collegiate Programming Contest**, ACM, LCPC

Extracurricular Activities

- 2018 - 2020 : **Volunteer**, Red Cross youth sector