Mohammad Sonji

Prospective PhD Student

Department of Computer Science
American University of Beirut
mms158@mail.aub.edu
My Webpage
Github *Linkedin*

Research Interest and Current Work

I am broadly interested in Systems, especially: High-Performance Computing, Architecture, and Compilers. Within these domains, I have a strong interest in subfields such as Parallel Computing, Accelerators (mainly GPUs, both in terms of hardware and software), and High-Performance/Heterogeneous/Cloud Computing. I have also developed a solid background in application performance and execution prediction, as well as performance variability. I am currently working on application performance variability, and on 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, Thesis title: Predicting If Executing Applications Are Near Completion

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

2018 - 2021 : **Bachelor of Science, Computer Science**, *Beirut Arab University*
CGPA: 3.76, Class rank: 3rd, Graduated with honors.

I was awarded a scholarship for outstanding academic performance every semester.

Experience

Research

June,2022 - present : ***Research Assistant***, *American University of Beirut, AUB & Hewlett Packard Labs, HPE*
I joined ***Dr. Izzat El Hajj's*** team in collaboration with Hewlett Packard Labs (HPE) led by ***Dr. Dejan Milojicic*** and his team, I have been working on multiple research projects related to application performance and execution prediction, performance variability, and heterogeneous serverless computing.

Teaching

Teaching Assistant, *American University of Beirut, AUB*

Fall 23-24 : CMPS221: Computer Organization & Design
Spring 22-23 : CMPS202: Intermediate Programming with Data Structures
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: CUDA, MPI, Pthreads
Imperative Programming Languages: C, C++, Python, JAVA, Bash
Logic Programming Languages: Prolog
Functional Programming Languages: Scheme
Operating Systems: Linux/Unix, Windows
Tools: Docker, Kubernetes, Knative
Compilers
Cloud Computing
Deep Learning
Version Control

Certificates

2022 : **Physical Science Responsible Conduct of Research**, AUB, CITI PROGRAM
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