Mohammad Arman Soleimani

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Education

Sharif University of Technology — Tehran, Iran

Bachelor of Science in Computer Engineering — *Expected February 2024*

- GPA: 19.17 (20-point scale)
- Undergraduate thesis topic: In-memory Processing (Graded 20 out of 20)

Research Experience

Research Assistant — September 2021 – Present

Institute for Research in Fundamental Sciences (IPM) and Sharif University of Technology — *Tehran, Iran*

- Explored processing-in-memory techniques for DRAM and SRAM
- Analyzed novel methods for in-memory bit-wise operations and hyper-dimensional computing
- Co-authored three papers published in DAC, ISLPED, and NocArc, and two manuscripts under review for ISCA and DAC

Research Assistant — July 2023 – September 2023

Sharif University of Technology — *Tehran, Iran*

- Implemented real-time scheduling algorithms using Reinforcement Learning (RL)
- Simulated various algorithms and experimented with different setups
- Co-authored a manuscript under review for IEEE IoT-J

Research Intern — July 2022 – September 2022

EPFL — *Lausanne, Switzerland*

- Accepted at the Summer@EPFL research internship program
- Studied the state-of-the-art in ASIC and FPGA routing using Reinforcement Learning (RL)
- Investigated different implementations and presented results

Publications

- Rohbani, Nezam, **Mohammad Arman Soleimani**, and Hamid Sarbazi-Azad. "CoolDRAM: An Energy-Efficient and Robust DRAM." In *2023 IEEE/ACM International Symposium on Low Power Electronics and Design (ISLPED)*, pp. 1-6. IEEE, 2023. (**Awarded Best Paper** in Track 1)
- Safari, Maede, Nezam Rohbani, **Mohammad Arman Soleimani**, and Hamid Sarbazi-Azad. "OCRA: An Oblivious Congested Region Avoiding Routing Algorithm for 3D NoCs." In *Proceedings of the 16th International Workshop on Network on Chip Architectures*, pp. 40-45. 2023.
- Rohbani, Nezam, **Mohammad Arman Soleimani**, and Hamid Sarbazi-Azad. "PIPF-DRAM: processing in precharge-free DRAM." In *Proceedings of the 59th ACM/IEEE Design Automation Conference*, pp. 1075-1080. 2022.

Manuscripts Under Review

- **Soleimani, Mohammad Arman**, Nezam Rohbani, Rouzbeh Pirayadi, Adrian Cristal, Osman Unsal, and Hamid Sarbazi-Azad. Manuscript proposing an in-DRAM processing scheme for hyper-dimensional classification and bit-wise operations. Under review for *2024 IEEE/ACM 51st Annual International Symposium on Computer Architecture (ISCA)*. (Name redacted due to double-blind review policies)
- Rohbani, Nezam, **Mohammad Arman Soleimani**, Behzad Salami, Adrian Cristal, Osman Unsal and Hamid Sarbazi-Azad. Manuscript proposing a processing-in-memory design for SRAM to increase parallelism and maintain double-end sensing. Under review for *2024 61st ACM/IEEE Design Automation Conference (DAC)*. (Name redacted due to double-blind review policies)
- Oustad, Elyas, Abolfazl Younesi, **Mohammad Arman Soleimani**, Mohsen Ansari, Sepideh Safari, Alireza Ejlali, and Jörg Henkel. "DIST: Energy-Efficient Q-Learning-Based Task Scheduling in Real-Time Fog Computing." Under review for *IEEE Internet of Things Journal*.

Additional Experience

Undergraduate Teaching Assistant September 2020 – Present
Sharif University of Technology *Tehran, Iran*
- Assisted with assignments in Operating Systems, Linear Algebra, Computer Architecture, Logic Design, Digital System Design, Computer Structure, and Fundamentals of Programming
- Developed course projects for Embedded Systems and Operating Systems

Intern October 2023 – Present
Zista Gene Afarin *Tehran, Iran*
- Investigating CNNs for efficient biomedical super-resolution

Mentor, IoT workshop July 2021 – September 2021
MadeInLobby Event, Sharif University of Technology *Tehran, Iran*
- Tutored students on Arduino programming and basic electronics

Selected Projects

Clock with Games | *Arduino, Edge Impulse* February 2023
- Created a tabletop clock with multiple features such as games
- Enabled spoken keyword detection using Edge Impulse

Bustan Classification | *Scikit-Learn, Machine Learning* July 2022
- Collaborated in a team to classify Farsi poem couplets

Multicore Image Manipulation | *CUDA, AVX2* July 2022
- Implemented algorithms such as Sobel edge detection and green-screen background changing

Matrix Block-Multiplier | *Verilog, Xilinx ISE, Spartan6* July 2021
- Designed, simulated and synthesized a block-multiplier for arbitrary-sized matrices
- Simulated the design using ModelSim and synthesized on an FPGA

Relevant Coursework

Introduction to Embedded Machine Learning Non-credit
Edge Impulse, offered through Coursera
Machine learning in python with scikit-learn Non-credit
Inria, offered through FUN
System-On-Chip Design (Graduate) 20.0/20.0
Sharif University of Technology
Artificial Intelligence 20.0/20.0
Sharif University of Technology
Computer Architecture 20.0/20.0
Sharif University of Technology

Achievements

- Best Paper in Track 1 (Technology, Circuits and Architectures) at ISLPED 2023 for our paper "CoolDRAM: An Energy-Efficient and Robust DRAM"
- Ranked 12th out of over 150,000 participants in the national university entrance exams (Concours), Mathematics and technology track, 2019
- Ranked 6th out of over 130,000 participants in the national university entrance exams (Concours), English language track, 2019

Skills

Languages:
Farsi: Native
English: IELTS Academic band 8.5 (S:9, L:9, R:9, W:7.5)
Programming: C/C++, Python, Java, Arduino
Hardware Description: Verilog
Libraries: Matplotlib, PyTorch, Scikit-Learn
Tools: HSPICE, ModelSim, Xilinx ISE, Quartus, gem5 (learning), Edge Impulse, CloudSim