

Alireza Khadem

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EDUCATION

UNIVERSITY OF MICHIGAN
PH.D. IN COMPUTER ENGINEERING
2019-24 | Ann Arbor, MI, USA
Advisor: Reetuparna Das
Cum. GPA: 4.0 / 4.0

UNIVERSITY OF TEHRAN
B.SC. IN COMPUTER ENGINEERING
2014-18 | Tehran, Iran
Advisor: Mehdi Modarressi
Cum. GPA: 3.83 / 4.0

COURSEWORK

GRADUATE

Computer Architecture
Parallel Computer Architecture
Accelerated Systems for Health and AI
Foundations of Artificial Intelligence

UNDERGRADUATE

VLSI Circuit Design
Hardware/Software Codesign
Parallel Programming
FPGA-Based Embedded System Design

SKILLS

LANGUAGES

Software

• C • C++ • Python • CUDA • R

Hardware

• System/Verilog • VHDL • UVM

Scripting

• Perl • Bash Script

TOOLS

ASIC Design

• Cadence Xcelium
• Synopsys Design Compiler
• HP CACTI

FPGA Design

• Intel Quartus and Modelsim
• Vivado and ISE Design Suite

GPU Design

• NVIDIA Visual Profiler • nvprof

Others

• Tensorflow • Caffe • DGL
• Version-Control Systems (Git/Hub)

LINKS

LinkedIn | GitHub | Google Scholar

WORK EXPERIENCE

DESIGN VERIFICATION INTERN | SEG, APPLE

May 2021 - August 2021 | Manager: Mufaddal Raja

- Worked in the Silicon Engineering Group to verify cache and coherency blocks.
- Enhanced verification infrastructure using UVM, SystemVerilog, and scripting.

RESEARCH EXPERIENCE

CE LAB | CSE DEPARTMENT, UNIVERSITY OF MICHIGAN

May 2021 - Present | Advisor: Reetuparna Das

- Working on in-memory processing of the graph neural networks.

January 2020 - April 2021 | Advisor: Trevor Mudge

- Proposed a Convolutional Neural Network (CNN) accelerator to exploit computation and data reuse using differential computation. [Article]

September 2019 - December 2019 | Advisor: John P. Hayes

- Implemented a novel weight-stationary CNN architecture and compared two stochastic CNN accelerators on top of the proposed architecture. [Article]

NOC LAB | ECE DEPARTMENT, UNIVERSITY OF TEHRAN

September 2017 - August 2018 | Advisor: Mehdi Modarressi

- Implemented a power-efficient neural network accelerator to eliminate repetitive computation. [Book Chapter][Article]

TEACHING EXPERIENCE

Fall 2021	Applied Parallel Programming with GPUs	Reetuparna Das
Winter 2021	Computer Architecture	Jonathan Beaumont
Fall 2020	Microarchitecture	Trevor Mudge
Winter 2018	Computer Aided Digital System Design	Mehdi Modarressi
Fall 2018	FPGA-Based Embedded System Design	Bijan Alizadeh Malfeh
Winter 2017	Computer Architecture	Saeid Safari

NOTABLE PROJECTS

- Verification of a Nack-Free MOSI Cache Coherence Protocol Equipped with Cruise Missile Invalidation and Atomic Load/Store using Murphi.
- Design and Implementation of R10K Micro-architecture Based Processor. (achieved the highest performance among EECS 470 final projects)
- Design and Analysis of A Genome Sequencing Accelerator for Seed Extension (Read-Alignment Problem) on a Software Defined Hardware.
- Automatic Accelerator Preemption Extension to Yosys Open SYNthesis Suite.
- Implementation of a Real-Time Object Recognition Accelerator for FPGA. (Received the best bachelor project award)
- Analysis of MNIST Implementation on GPGPU Using nvprof.
- Implementation of an Audio Player Using Custom Instruction on FPGA.

AWARDS

2019	College of Engineering Dean's Fellowship, University of Michigan
2018	Ranked 1st in Class of 2014, Hardware Group, University of Tehran
2018	Best B.Sc. Thesis Award, University of Tehran
2017	Faculty Of Engineering (FOE) award, University of Tehran