

Morteza Baradaran

☎ 434-257-3579
✉ morteza@virginia.edu
🌐 Homepage - [in LinkedIn](#)
🐙 github.com/Morteza1814

85 Engineer's Way,
Rice Hall, Office:Rice 436
University of Virginia,
Charlottesville, VA 22904

Overview

My interests lie broadly in Computer Architecture, Bioinformatics, and Domain Specific Accelerators. I'm interested in exploring novel hardware and software techniques to enhance the performance, energy efficiency, and programmability of domain specific accelerators. I also have extensive experience in designing high-performance, energy-efficient embedded systems for core consumer products.

Notable Projects

Unidentified Genome Partial Matching

Language: C/C++, Python

Goal: Design and Implementation of a Genome Partial Matcher to Find Similarities Between the Unidentified Genomes and Metagenomics Databases

Links: <https://github.com/Morteza1814/GenomePartialMatching>

Banking Integrated Card Personalization System (IPS)

Language: C, C++, Java

Goal: Developing a Banking Card Personalization System Capable of Acquiring Customers' data and Personalizing it for Various Types of Banking Cards

Automatic Train Control Systems for Metro and Urban Railway

Language: C++

Goal: Developing and Analyzing Metro & Urban Railway Signalling and Telecommunication Systems (i.e., ATC, ATP, etc)

Self-Service Ticketing System of Tehran Metro and Bus Rapid Transit Routes

Language: C, C++

Goal: Developing Firmware, Memory Management, and File Management of the POS Terminals for Tehran's Subway Ticketing System

National Electronic Passport Operating System

Language: C++

Goal: Design and Implementation of OS Components for ARM7 Chip including Memory management, File System, and IO management

Education

University of Virginia , Charlottesville, USA Ph.D., Computer Science (Advisor: Prof. Kevin Skadron)	Sep. 2021 - Now (GPA: 3.94)
Sharif University of Technology , Tehran, Iran M.Sc., Computer Architecture (Advisor: Prof. H. Sarbazi-Azad)	Sep. 2010 - June 2012
Shahed University , Tehran, Iran B.Sc., Computer Engineering	Sep. 2006 - June 2010

Work Experience

Informatics Services Corp , Tehran, Iran Senior Software Development Engineer: Design and Development of Debit and Credit Card Personalization Systems	Sep. 2018 - Aug. 2021
TOSAN Group Corp , Tehran, Iran Lead Software Engineer: POS Development for ticketing system of Tehran Metro (QR, contactless cards)	June 2017 - Apr. 2018
MAHARAN Co , Tehran, Iran Software Engineer: Design & development of Automatic Train Control (ATC) and intermediate block system	May 2015 - Feb. 2017
National-ID Co , Tehran, Iran Hardware Specialist: Smart Card OS Design and Implementation including Memory management, File system, and I/O	Jul 2012 - Dec. 2013

Skills

Programming Languages/APIs:

• C/C++, Java, Python, Bash, Assembly Programming (x86), Verilog

Simulators and Analyzers:

• Gem5 Architectural Simulator, Multi2Sim, ChampSim, CACTI, Synopsys Synthesis

Benchmarking and Performance Analysis:

• SPEC Benchmarks, PARSEC Benchmarks

Industry Software Skills:

• KEIL, Jet Brain (IntelliJ IDEA, Youtrack), Microsoft SQL Server, OOP, DevOps, Design Patterns, JUnit, Maven, Sonarqube

Practical Skills:

• Embedded System Design, Software Development, Operating System Implementation, SOC Design

Research Experience

University of Virginia, Charlottesville, USA, Graduate Research Assistant Projects: <ul style="list-style-type: none">• Design and Implementation of an Unidentified Genome Partial Matcher	Sep. 2021 - Now
Institute for Research in Fundamental Sciences (IPM), Tehran, Iran, Graduate Research Assistant Projects: <ul style="list-style-type: none">• Energy Consumption Analysis of Instruction Cache Prefetching Methods	Sep. 2019 - Aug. 2021
Sharif University of Technology, Tehran, Iran, Graduate Research Assistant Projects: <ul style="list-style-type: none">• Obtaining Better Processor Performance through a Shared Structure between Cache and BTB	Sep. 2010 - June 2012

Publications

- **M. Baradaran**, A. Ansari, M. Sadrosadati, and H. Sarbazi-Azad, “Energy Consumption Analysis of Instruction Cache Prefetching,” in **Submission**
- **M. Baradaran** and M. Zarei, “Theory of Automata and Machine Language,” in *National Library of Iran, ISBN 978-600-6927-22-0, 2012-2013*

Courses

CS6501: Geometry of Data University of Virginia	Fall 2022
CS6316: Machine Learning University of Virginia	Spring 2022
CS6160: Theory of Computation University of Virginia	Fall 2021
CS6354: Computer Architecture University of Virginia	Fall 2021

Teaching Experience

Teaching Assistant, CS4414: Undergraduate Operating System University of Virginia	Fall 2022
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References

Two references will be made available upon request.