Seyed Armin Vakil Ghahani

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EDUCATION

Pennsylvania State University, University Park, PA — Aug 2018 – Now

- Graduate Teaching Assistant in Electrical Engineering And Computer Science Department
  - Advisor: Prof. Mahmut Kandemir
  - GPA: 4/4 (up to now)

Sharif University Of Technology, Tehran, Iran — Sep 2013 – Jul 2018

- Bachelor of Science (B.S.) in Computer Engineering - Hardware
  - Thesis: Cache Replacement Policy Based on Expected Hit Count
    Advisor: Prof. Hamid Sarbazi-Azad
  - Average: 16.48 / 20
  - **Relevant Coursework**: Average: 18.09 / 20
  - **Related Courses**: Advanced Computer Architecture - **Graduate Course** (20/20), Low Power Design - **Graduate Course** (18.7/20), Advanced Logic Design (20/20), Digital System Design (20/20), Compiler Design (20/20), Advanced Programming - C++ (20/20), Signals & Systems (20/20), Data Structures & Algorithms (19.9/20), Operating Systems (19.6/20), Engineering Probability & Statistics (18.4/20), Microprocessors (18.3/20), Computer Networks (18.2/20), Real-Time Systems (17.9/20), Computer Architecture (17.5/20)

RESEARCH INTERESTS

- Computer Architecture
- Memory Systems
- GPUs
- Hardware Security
- SSDs

PUBLICATIONS

- Bakhshalipour, M., Faraji, A., **Vakil-Ghahani, S.A.**, Samandi, F., Lotfi-Kamran, P., and Sarbazi-Azad, H. (2019) *Reducing Writebacks Through In-Cache Displacement.* ACM Transactions on Design Automation of Electronic Systems (TODAES).
- **Vakil-Ghahani, S.A.**, Mahdizadeh-Shahri, S., Bakhshalipour, M., Lotfi-Kamran, P., and Sarbazi-Azad, H. (2018). *Making Belady-Inspired Replacement Policies More Effective Using Expected Hit Count.* arXiv preprint arXiv.
- **Vakil-Ghahani, A.**, Mahdizadeh-Shahri, S., Lotfi-Namin, M. R., Bakhshalipour, M., Lotfi-Kamran, P., and Sarbazi-Azad, H. (2017). *Cache Replacement Policy Based on Expected Hit Count.* IEEE Computer Architecture Letters (CAL).

WORK EXPERIENCE

- System Developer, **I-Cliqq** — Jan 2018 – Aug 2018
  - Designing Embroidery Software
- System Developer, **Viratech Sharif**, Tehran, Iran — Sep 2015 – Sep 2016
  - Traffic Simulator (C++) - High Speed Network Simulator
  - Add tunneling protocol between link, internet, and transport layer

RESEARCH EXPERIENCE

- **Sharif University of Technology and Institute for Research in Fundamental Sciences (IPM)**
  Research Assistant - Advisors: Dr. Lotfi-Kamran, Prof. Sarbazi-Azad — Sep 2016 – Aug 2018
  ◇ **Cache Replacement Policy Based on Expected Hit Count** - My B.Sc. thesis project is about predicting the relative reuse-distance between cache blocks by remaining hit count of each block. In this work, we proposed that there is a correlation between reuse-distance and the remaining hit count, therefore, by predicting the remaining hit count of each block we choose the best victim.
  ◇ **Evaluating different cache replacement policies' performance on different cache levels** - My current work is evaluating state-of-the-art replacement policies such as Hawkeye, Multiperspective, ShiP, etc. on different cache levels such as L1I/D, L2, L3(LLC) with Champsim Simulator.

TEACHING EXPERIENCE

- Teaching Assistant at Pennsylvania State University, held office hours, answered emails, graded student homeworks, labs, quizes, and exams.
  - Computer Organization and Design (CMPEN 331) — Fall 2018, Spring 2019
- Teaching Assistant at Sharif University of Technology
  - Computer Architecture — Fall 2016, 2017
  - Digital System Design — Spring & Fall 2017
  - Digital Design — Spring 2017
  - Advanced Logic Design — Fall 2016
  - Discrete Structures — Spring 2016
  - Advanced Programming — Fall 2014, 2015
  - Fundamental Of Programming — Spring & Fall 2014
- Teaching Combinatorics, Graph Theory, Algorithm, and Programming — Sep 2013 – Mar 2018
  - National Organization for Development of Exceptional Talents high schools in different cities such as Tehran, Khoramabad, Zahedan, Semnan, and Shahrud
  - Salam YousefAbad, Salam Dibaji, and Mofid high schools

HONORS AND AWARDS

- Qualify for 2nd Cache Replacement Championship (CRC-2)
  - Cache Replacement Policy Based on Expected Hit Count — Jun 2017
- **Silver Medal** in 22nd Iran National Olympiad in Informatics(INOI) — Sep 2012
- **Ranked 10th** in 1st Round of 22nd Iran National Olympiad in Informatics among 10,000 participants — Mar 2012

SKILLS

- Computer Architecture Simulators: gem5, SimpleSSD, Champsim
- Programming Languages: C/C++, Verilog, R, Shell, MIPS
- Tools & Frameworks: DynamoRIO, LLVM, Google Protobuf, Qt
- Operating Systems: Ubuntu(Native), Windows
- Type Setting: Microsoft Office, LaTeX

EXTRA-CURRICULAR ACTIVITY

- **Sharif AI Challenge** (Contest Organizer) — Jan 2015 – Jan 2017
  - Student Programming Contest
  - C++ Client
- **1st Gateuino Contest** (Contest Organizer) — May 2016
  - L1D-Prefetching Contest
- **Trax Game** — Apr 2016
  - Two player game based on Verilog
- **Judge** — Mar 2015
  - Designing and implementing a judge system for evaluating codes
- **Suduko** — Jan 2013
  - Graphical Suduko game based on GTK

COURSE PROJECTS

- **NoC** — Jan 2016
  - 3D Mesh Network on Chip based on Verilog
- **Plants vs Zombies** — Jul 2014
  - Based on Qt Creator
- **Billiard** — Jan 2014
  - Graphical Billiard game based on GTK

LANGUAGES

- Persian: Native
- English: Fluent

HOBBIES

Football, climbing, teaching.