Hamidreza Zare

CS Ph.D. Student at Penn State University

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Education

Penn State University

State College, PA

Doctor of Philosophy in Computer Science, GPA: 3.83/4.0 — *Aug. 2019 - Present*

- **Advisors:** Professor Bhuvan Urgaonkar and Professor Viveck Cadambe — *Working on methods to operate geo-distributed consistent storage systems cost-effectively on the public cloud*
- **Relevant Graduate Courses:** Fundamentals of Computer Architecture, Algorithm Design and Analysis, Distributed algorithms, Operating System Design, Cloud Computing, Performance Evaluation

Sharif University of Technology

Tehran, Iran

Bachelor of Science in Computer Engineering, GPA: 18.73/20.00 (3.94/4.00) — *Sept. 2015 - Jun. 2019*

- **Thesis:** A new architecture for Die-Stacked DRAM considering both dynamic and static behavior of modern big-data applications; Using Die-Stacked DRAM partly as a part of memory and partly as a cache — *In HPCAN lab under the supervision of Professor Hamid Sarbazi-Azad*

NODET (National Organization for Exceptional Talents), Dastgheib 1

Shiraz, Iran

Diploma in Physics and Mathematics, GPA: 19.44/20.00 (4.00/4.00) — *Sept. 2011 - Jun. 2015*

Research Interests

Cloud Computing

- Storage systems
- Resource Management and Scheduling

Distributed Systems

Computer Systems

Computer Architecture

Work Experience

Scientific Green Co. Ltd

Tehran, Iran

Intern - System Software Developer — *Jul. 2018 - Sept. 2018*

The company was developing an infrastructure based on LoRaWAN to offer IoT services. My job was to customize the device authentication code in loraserver.io (an open-source LoRa server stack) to make them able to use their protocol.

NAAD

Tehran, Iran

System Software Developer — *Jun. 2017 - Sept. 2017*

They were designing an HSM (using wolfSSL on Xilinx SoC). I developed a logger for the module in C++ and wrote python scripts to automate testing the module.

Teaching Experience

Penn State University

State College, PA

Teaching Assistant — *FALL 2020*

- **Distributed systems (CSE513)**
- Instructed by Professor Bhuvan Urgaonkar

Penn State University *State College, PA*

TEACHING ASSISTANT *SPRING 2020*

- **Introduction to Systems Programming Course (CMPSC311)**
- Instructed by Professor Patrick McDaniel

Sharif University of Technology *Tehran, Iran*

TEACHING ASSISTANT *FALL 2018*

- **Computer Language and Structure**
- Dr. Hossein Asadi

Sharif University of Technology *Tehran, Iran*

TEACHING ASSISTANT *FALL 2017*

- **Computer Language and Structure**
- Dr. Hossein Asadi

Sharif University of Technology *Tehran, Iran*

TEACHING ASSISTANT *SPRING 2017*

- **Logical Circuit**
- Dr. Siavash Bayat-Sarmadi

Sharif University of Technology *Tehran, Iran*

TEACHING ASSISTANT *FALL 2016*

- **Fundamentals of Programming**
- Dr. Omid Gheibi

Research Experience

Penn State University *State College, PA*

RESEARCH ASSISTANT *Aug. 2019 – Present*

- **Under the supervision of Professor Bhuvan Urgaonkar and Professor Viveck Cadambe**
- Public clouds are an ever-emerging technology solution to users' needs of computing engines and storage services. Having several big public cloud providers, each offering a broad range of VM options with different price structures, presents the users with a bewildering choice of VM types. A poor choice of VMs can have significant implications on performance and costs. Moreover, storage services that present a linearizability memory consistency model to users are an essential sub-class of storage services. There are several methods based on replication and erasure coding to implement these storage systems, bringing more options for users to pick.
  We develop an optimization framework to compute the near-optimal configuration among replication and erasure coding as well as among various data center placements based on the public cloud pricing structure and characteristics of the workload. Furthermore, we develop a cost-effective geo-distributed linearizable key-value store over the public cloud that uses our optimization framework to periodically compute the optimal configuration and reconfigure the key-value store to the found configuration in order to capture dynamism in workloads' characteristics while maintaining linearizability.
  The key-value store has been developed in C++ and tested over nine datacenters in Google Cloud Platform.

Sharif University of Technology *Tehran, Iran*

RESEARCH ASSISTANT *Jan. 2017 – Jun. 2019*

- **Under the supervision of Professor Hamid Sarbazi-Azad**
- Die-stacked DRAM is a promising solution to the memory bandwidth bottleneck of multi-core processors, but it cannot accommodate the entire dataset of the modern big-data applications. Prior works have tried to use it as a large cache in the memory hierarchy or as a part of the main memory. Works that use it as a cache while adapting to dynamism in applications but suffer from the tag storage/latency/bandwidth overhead. On the other hand, works that use Die-stacked DRAM as a part of main memory while eliminating the need for tags, and hence, providing efficient access to data, but lack adapting to dynamism in applications. Considering both the dynamic and static behavior of the modern big-data applications, we proposed a new architecture to use the Die-Stacked DRAM partly as a part of the main memory and partly as a cache. The paper is available at arxiv.org/abs/1809.08828.

Honors

Ranked 365th Among the 180000+ participants in the National Universities Entrance Exam

Admitted to NODET passing an exam with an acceptance rate below 2%

Skills

Programming	Expert in (C and C++), Python, Bash, Node.js (familiar), X86 Assembly, Verilog (HDL)
Frameworks & Tools	Git, Google Protobuf, gRPC, Google Cloud Platform, ZSim, GAP Benchmark Suite, Modelsim, Quartus
Operating Systems	Ubuntu, Windows
Type Setting	LaTeX, Microsoft Office

References

Professor Bhuvan Urgaonkar

Associate Professor of Computer Science and Engineering department and Graduate Program Coordinator at Penn State University

- **Website:** cse.psu.edu/~buu1
- **Email:** buu1@psu.edu

Professor Viveck Cadambe

Associate Professor in the Department of Electrical Engineering at Penn State University

- **Website:** ee.psu.edu/viveck
- **Email:** viveck@psu.edu

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