

# 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: 3.85/4.0

*Aug. 2019 - Present*

- **Advisors:** Professor Bhuvan Ugaonkar 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

### Yugabyte, Inc.

[Sunnyvale, CA](#)

INTERN - SOFTWARE ENGINEER

*Aug. 2021 - Present*

Yugabyte's main product is YugabyteDB, an open-source, cloud-native, high-performance distributed SQL database for global-scale applications that need low query latency, high availability, and extreme resilience against failures. As a cloud-native database, it can be deployed across public and private clouds. To make the deployment of YugabyteDB even more seamless, the company has developed "Platform." Platform orchestrates and manages YugabyteDB clusters on one or more regions. As a software engineer intern, I am designing and implementing methods to edit the VMs in a cluster without significant interruption to the client's operations.

### 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 lorasever.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

TEACHING ASSISTANT

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

State College, PA

FALL 2020

## Penn State University

TEACHING ASSISTANT

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

State College, PA

SPRING 2020

## Sharif University of Technology

TEACHING ASSISTANT

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

Tehran, Iran

FALL 2018

## Sharif University of Technology

TEACHING ASSISTANT

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

Tehran, Iran

FALL 2017

## Sharif University of Technology

TEACHING ASSISTANT

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

Tehran, Iran

SPRING 2017

## Sharif University of Technology

TEACHING ASSISTANT

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

Tehran, Iran

FALL 2016

## Research Experience

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### Penn State University

RESEARCH ASSISTANT

- **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.

State College, PA

Aug. 2019 – Present

### Sharif University of Technology

RESEARCH ASSISTANT

- **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](https://arxiv.org/abs/1809.08828).

Tehran, Iran

Jan. 2017 – Jun. 2019

## Honors

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**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

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<b>Programming</b>	Expert in (C and C++), Python, Bash, Node.js (familiar), X86 Assembly, Verilog (HDL)
<b>Frameworks &amp; Tools</b>	Git, Linux, Google Protobuf, gRPC, Google Cloud Platform, Ansible, ZSim, GAP Benchmark Suite, Modelsim, Quartus
<b>Type Setting</b>	$\LaTeX$ , Microsoft Office

## References

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### Professor Bhuvan Urgaonkar

PROFESSOR OF COMPUTER SCIENCE AND ENGINEERING DEPARTMENT AT PENN STATE UNIVERSITY

- **Website:** [cse.psu.edu/~buu1](https://cse.psu.edu/~buu1)
- **Email:** [buu1@psu.edu](mailto:buu1@psu.edu)

### Professor Viveck Cadambe

ASSOCIATE PROFESSOR IN THE DEPARTMENT OF ELECTRICAL ENGINEERING AT PENN STATE UNIVERSITY

- **Website:** [ee.psu.edu/viveck](https://ee.psu.edu/viveck)
- **Email:** [viveck@psu.edu](mailto:viveck@psu.edu)