Shashank Gugnani

Contact Information

400 Oracle Parkway
Redwood City, CA

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Research Interests

High performance filesystems and storage, distributed computing, and database systems

Education

The Ohio State University, Columbus, OH — 2015 - 2021
Ph.D., Computer Science
Thesis: Designing Scalable Storage Systems for Non-Volatile Memory

BITS-Pilani, India — 2011 - 2015
B.E., Computer Science
Thesis: Evaluation And Implementation of Utilizing Hadoop in a Scientific Gateway Environment

Work Experience

Oracle, Redwood Shores, CA — 2021 - present
Senior Engineering Manager — Oct 2025 - present
Engineering Manager — Dec 2023 - Oct 2025
Role: I lead a team working on the design and development of application development technologies in the Oracle database

Senior Software Engineer — Feb 2021 - Dec 2023
Role: Design and development of next-generation Oracle database products

The Ohio State University, Columbus, OH — Aug 2015 - Dec 2020
Graduate Research Associate, Department of Computer Science
Role: Designing storage systems for next-generation cloud environments

IBM Research, Almaden, CA — June 2020 - Aug 2020
Research Intern, Storage Systems Research Group — May 2019 - Aug 2019
Role: Designing software to make persistent memory easier to use

University of Westminster, London, UK — Jun 2014 - Dec 2014
Visiting Researcher, Center for Parallel Computing
Role: Extending scientific workflow systems to support big data workloads

Achievements and Activities

- Reviewer for SIGMOD'26, IEEE TPDS, MASCOTS'19, IPDPS'18, and ICS'17
- Selected for ACM Student Research Competition at SC'18 and SC'17
- Awarded student travel grant for SC'18, SC'17, NVMW'18, and HiPC'17
- Presented talks at VLDB'25, SIGMOD'25, GraphQLConf'24, VLDB'21, HPDC'21, IPDPS'21, Data Works Summit'18, HiPC'17, CloudCom'16, and IDCS'14
- Presented tutorials at IISWC'20 and SC'18

Research Projects

***Memory Fabric: Data Management for Large-Scale Hybrid Memory Systems*, National Science Foundation, Oct'18 - Dec'20**
Role: Designing new abstractions and mechanisms to allow storage systems to efficiently utilize non-volatile memory.

***NeuroHPC: Advanced Computational Neuroscience*, National Science Foundation, Sep'16 - May'19**

Role: Developing scalable solutions for linear fascicle evaluation of the brain connectomme with MPI. Resulting designs are publicly available on docker hub (link).

***HiBD: Scalable Middleware for Managing and Processing Big Data on Next Generation HPC Systems*, National Science Foundation, Aug'15 - Aug'17**
Role: High-performance designs for HBase and Hadoop with RDMA. Developed designs were distributed as publicly available software releases (link).

***Chameleon: A Large-Scale, Reconfigurable Experimental Environment for Cloud Research*, National Science Foundation, Aug'15 - Sep'17**
Role: Design and development of high-performance Big Data middleware and appliances for next-generation cloud environments. Developed appliances were made publicly available through the Chameleon appliance catalog (link).

***CloudSME: Cloud-based Simulation Platform for Manufacturing and Engineering*, European Commission FP7 Capacities, Jun'14 - Dec'14**
Role: Extended scientific workflow systems to support MapReduce based applications in the cloud. As part of the project, optimal strategies for infrastructure management and integration with workflows were developed (link).

Patents

1. **S. Gugnani**, A. Mylavarapu, S. Pendse, T. Lahiri, S. Ahmed, S. Gowda, B. Hammerschmidt, Z. Liu, "Automated migration from a document database to a relational database", US Patent 20250147936A1
2. Z. Liu, J. Loaiza, S. Abraham, S. Bose, H. Chang, **S. Gugnani**, B. Hammerschmidt, T. Lahiri, Y. Lu, D. McMahon, A. Mishra, A. Mylavarapu, S. Pendse, A. Raghavan, "Natively supporting JSON duality view in a database management system", US Patent 12287777B2
3. **S. Gugnani**, S. Guthridge, F. Schmuck, T. Anderson, and D. Bhagwat, "Fine-Grained Forced Cache Eviction", US Patent 201909738

Posters

1. **S. Gugnani**, X. Lu, and D.K. Panda, "Accelerating Big Data Processing in the Cloud with Scalable Communication and I/O Schemes", SC 2018

Tutorials

1. X. Lu, H. Shi, and **S. Gugnani**, "Benchmarking and Accelerating Big Data Systems With RDMA, PMEM, and NVMe-SSD", IISWC 2020
2. D.K. Panda, X. Lu, and **S. Gugnani**, "Exploiting HPC Technologies for Accelerating Big Data Processing and Associated Deep Learning", SC 2018

Select Publications

1. **S. Gugnani**, Z. Liu, H. Chang, B. Hammerschmidt, S. Kareenhalli, K. Kumar, T. Lahiri, Y. Lu, D. McMahon, A. Mylavarapu, S. Pendse, and A. Raghavan, "JSON Relational Duality: A Revolutionary Combination of Document, Object, and Relational Models", SIGMOD 2025
2. **S. Gugnani** and X. Lu, "DStore: A Fast, Tailless, and Quiescent-Free Object Store for PMEM", HPDC 2021
3. **S. Gugnani**, T. Li, and X. Lu, "NVMe-CR: A Scalable Ephemeral Storage Runtime for Checkpoint/Restart with NVMe-over-Fabrics", IPDPS 2021
4. **S. Gugnani**, A. Kashyap, and X. Lu, "Understanding the Idiosyncrasies of Real Persistent Memory", VLDB 2021

5. T. Li, D. Shankar, **S. Gugnani**, and X. Lu, "RDMP-KV: Designing Remote Direct Memory Persistence based Key-Value Stores with PMEM", SC 2020
6. **S. Gugnani**, X. Lu, H. Qi, L. Zha, and D.K. Panda, "Characterizing and Accelerating Indexing Techniques on Distributed Ordered Tables", IEEE Big Data 2017
7. X. Lu, D. Shankar, **S. Gugnani**, and D.K. Panda, "High-Performance Design of Apache Spark with RDMA and Its Benefits on Various Workloads", IEEE BigData 2016
8. **S. Gugnani**, C. Blanco, T. Kiss, and G. Terstyanszky, "Extending Science Gateway Frameworks to Support Big Data Applications in the Cloud", Journal of Grid Computing, 2016

Software Skills

- C, C++, Java, Bash, and SQL

Teaching Experience

- Instructor for OSU CSE 1223: Introduction to Programming in Java, Spring 2020
- Instructor for OSU CSE 1223: Introduction to Programming in Java, Fall 2019
- Grader for OSU CSE 3421: Computer Architecture, Spring 2016
- Grader for OSU CSE 2331: Algorithms, Fall 2015

Mentorship Experience

Mentored the following junior PhD students at OSU:

- Tianxi Li
- Arjun Kashyap

Mentored the following interns and coworkers at Oracle:

- Yundi Bao
- Sarvesh Tandon
- Jainam Shah
- Shubham Pednekar
- Revathi Ari

References

Available upon request