

Dr. Sandeep Kumar

RESEARCH SCIENTIST @ INTEL, BENGALURU, INDIA

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Interest

Memory management of modern workloads including VectorDB, LLM, and large memory footprint applications in a heterogeneous system.

Selected Publications

1. *TierScape: Harnessing Multiple Compressed Tiers to Tame Server Memory TCO*
Sandeep Kumar, Aravinda Prasad, and Sreenivas Subramoney. In **EuroSys**, 2026.
2. *TierTrain: Proactive Memory Tiering for CPU-Based DNN Training*
Sathvik Swaminathan, **Sandeep Kumar**, Aravinda Prasad, and Sreenivas Subramoney. In **ISMM**, Seoul, South Korea, 2025.
3. *A Tug-of-War between Static and Dynamic Memory in Intel SGX*
Sandeep Kumar, Abhisek Panda, Advait Nerlikar and Smruti R. Sarangi. In **VLSID, Bangalore, India**, 2024.
4. *Telescope: Telemetry for Gargantuan Memory Footprint Applications*
Alan Nair, **Sandeep Kumar**, Aravinda Prasad, Ying Huang, Andy Rudoff, Sreenivas Subramoney. In **USENIX, ATC, USA**, 2024.
5. *Enabling Migration of Large SGX Enclaves in a Data Center*
Sandeep Kumar, Abhisek Panda, Smruti R. Sarangi. In **arXiv**, 2024.
6. *Perspector: Benchmarking Benchmark Suites*
Sandeep Kumar, Abhisek Panda, Smruti R. Sarangi. In **DATE**, Antwerp, Belgium, 2023.
7. *Hardware-Assisted Mechanisms to Enforce Control Flow Integrity: A Comprehensive Survey*
Sandeep Kumar, Diksha Moolchandani, Smruti R. Sarangi. In Journal of Systems Architecture (JSA)
8. *SecureLease: Maintaining Execution Control in The Wild using Intel SGX*
Sandeep Kumar, Abhisek Panda, and Smruti R. Sarangi. In **Middleware**, Quebec City, Canada, 2022.
9. *SGXGauge: A Comprehensive Benchmark Suite for Intel SGX*
Sandeep Kumar, Abhisek Panda, and Smruti R. Sarangi. In **ISPASS**, Singapore, 2022.
10. *SecureFS: A Secure File System for Intel SGX*
Sandeep Kumar and Smruti R. Sarangi. In **RAID**, Spain, 2021.
11. *Page Table Management for Heterogeneous Memory Systems*
Sandeep Kumar, Aravinda Prasad, Smruti R. Sarangi, and Sreenivas Subramoney. In **ISMM**, Canada, 2021.
12. *F-LaaS: A Control-Flow-Attack Immune License-as-a-Service Model*
Sandeep Kumar, Diksha Moolchandani, Takatsugu Ono, and Smruti Sarangi. In **IEEE SCC**, Milan, Italy, 2019.
13. *Towards a Portable Human Gait Analysis & Monitoring System*
Sandeep Kumar, Poorna Talkad Sukumar, K. Gopinath, Dr. Jayanth Sampath, Laura Rocchi, and Suyameendra Kulkarni..In **IEEE ICSigSys**, Bali, Indonesia, 2018.
14. *Scalable Performance Tuning of Hadoop MapReduce: A Noisy Gradient Approach*
Sandeep Kumar, Sindhu Padakandla, Chandrashekar L, Priyank Parihar, Gopinath K, and Shalabh Bhatnagar. In **IEEE Cloud**, Hawaii, USA, 2017.

Patents

1. Context-aware memory tiering for machine learning training
Sathvik Swaminathan, Sandeep Kumar, Aravinda Prasad, and Sreenivas Subramoney
2. Methods and apparatus to profile page tables for memory management.
Aravinda Prasad, Sandeep Kumar, Sreenivas Subramoney, and Andy Rudoff

Education

Indian Institute of Technology Delhi

DOCTOR OF PHILOSOPHY

- Advised by Prof. S. R. Sarangi

New Delhi, India

Jul. 2017 - Jun 2024

Indian Institute of Science

MASTER OF ENGINEERING IN COMPUTER SCIENCE

- Advised by Prof. K. Gopinath

Bangalore, India

Jul. 2011 - Aug. 2013

Guru Gobind Singh Indraprastha Univeristy

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE

New Delhi, India

Jul. 2007 - Aug. 2011

Work Experience

Intel Labs

RESEARCH SCIENTIST

- Working on developing methods and tools for a better synergy between the hardware and the software.

Bangalore, Karnataka

March 2022 – Current

Intel Labs

GRADUATE RESEARCH INTERN

- Developed and optimized memory tiering strategies for page table pages, enhancing efficiency and performance in a heterogeneous memory system.

Bangalore, Karnataka

July 2020- Jan 2021

Indian Institute of Science

RESEARCH ASSOCIATE

- Implemented and refined auto-tuning of Hadoop MapReduce workflows using advanced stochastic algorithms, driving performance optimization and efficiency.
- Designed and developed advanced models for human gait analysis leveraging Inertial Measurement Unit (IMU) sensors, enabling precise motion tracking and insights.

Bangalore, Karnataka

Sept 2014- July 2017

Dell R&D

SOFTWARE DEVELOPMENT ENGINEER

- Responsible for BIOS configuration and system management tools, DCC (Dell Command Configure) and OMCI (Open Manage Client Instrumentation) respectively

Bangalore, India

Jul 2013-Jun 2014

Interests & Activities

Reading

Goodreads profile:

<https://goodreads.com/sandeep007734>

Running, Cycling, and Hiking

Strava profile:

<https://www.strava.com/athletes/sandeep007734>

References

Prof. Smruti R. Sarangi

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Indian Institute of Technology Delhi, New Delhi, India

Prof. K. Gopinath

Professor

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Computer Science and Automation

Indian Institute of Science, Bangalore, India