

Prachatos Mitra

Email: pmitra32@gatech.edu

Phone: +1 (404)-259-3077

Linkedin: <https://www.linkedin.com/in/prachatos/>

Website: <https://prachatos.github.io>

EDUCATION

Georgia Institute of Technology

PhD, Computer Science

Advisor: Dr. Alexandros Daglis

January 2023 - Present

GPA: 4.0/4.0

Indian Institute of Science

Master of Technology, Computer Science

M.Tech thesis advisor: Dr. Arkaprava Basu

August 2018 - July 2020

GPA: 8.80/10.00

Maulana Abul Kalam Azad University of Technology

Bachelor of Technology, Computer Science and Engineering

August 2014 - July 2018

GPA: 9.01/10.00

RESEARCH PROJECTS

• **Novel hierarchical architecture for massive sparse graphs**

Georgia Institute of Technology

2023-ongoing

Working on designing the network architecture and statistical simulator for a large-scale hierarchical graph processing system. Working on optimizations in hardware for common graph applications such as BFS and scaling results to massive graph and system sizes using statistical simulation.

• **Dead Page and Dead Block Predictors: Cleaning TLBs and Caches Together**

Indian Institute of Science (Master's thesis)

2019-2020

In this work, we demonstrated the presence of “dead” or unused entries in the L2 TLB. We designed and implemented a dead-page predictor to improve TLB efficiency by bypassing such entries. Using information from this predictor, we designed a dead-block predictor for last level caches that provides significant performance gains (over 8%) with low storage overheads.

• **Exploring file access mechanisms in the context of Kernel Page Table Isolation**

Indian Institute of Science

2019

Kernel Page Table Isolation (KPTI), the defense for the Meltdown vulnerability, made system calls such as read() / write() slower due to the need to switch between kernel and user page tables. We compared the performance of I/O with system calls to memory-mapped files with KPTI turned on and off. We implemented heuristics for prefetching in the Linux kernel page cache to further improve the performance for memory-mapped files with KPTI on.

PUBLICATIONS

- [1] **HPCA-27:** Chandrashis Mazumdar*, **Prachatos Mitra***, Arkaprava Basu, “Dead Page and Dead Block Predictors: Cleaning TLBs and Caches Together”, Proceedings of 27th IEEE International Symposium on High-Performance Computer Architecture (HPCA-27) (virtual), February, 2021. Available at: <https://bit.ly/3u9MwGU>
- [2] **SC-W '23:** **Prachatos Mitra**, Alexandros Daglis, “Filtering Wasteful Vertex Visits in Breadth-First Search”, Proceedings of the SC '23 Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis, November 2023. Available at: <https://doi.org/10.1145/3624062.3625133>

TALKS AND PRESENTATIONS

- [1] **KVM Forum 2021:** **Prachatos Mitra** and Soham Ghosh “Support for Fast and Reliable VMM Live Upgrades in Libvirt”, KVM Forum 2021 (virtual). Available at: <https://bit.ly/38cQHJT>

*Equal contribution

WORK EXPERIENCE

Nutanix

Member of Technical Staff

Bangalore, India

August 2020 - September 2022

Software developer for AHV hypervisor. Worked on projects on KVM, Libvirt and qemu and control plane for the hypervisor.

AMD

Senior Silicon Design Engineer

Bangalore, India

September 2022 - December 2022

Worked in Server Performance Group. Performed performance analysis and improvements for virtualization and networking workloads.

TECHNICAL SKILLS

Languages

C, C++, Python

Simulation tools

SST, gem5, Sniper