Prateek Sahu

Architecture, Computer Systems, and Embedded Systems

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Education

- Ph.D. bound at **University of Texas at Austin** in **Electrical and Computer Engineering** *(2017 - Present: 3.9 GPA)*
- Undergraduate at **Indian Institute of Technology, Kanpur** in **Electrical Engineering** *(2011 - 2015: 8.2 GPA)*

Research

Interests: Architecture, Systems and processor security, Data privacy, Hardware/Software for performance and efficiency

- **Detection of micro-architectural attacks** *(UT Austin, Jan 2018 - present)*
  - Micro-architectural malware detector based on contention across various security domains
  - Novel property of contention direction across security labels in malicious program phases
  - Evaluate against cache based side and covert channels like Prime-Probe and Spectre
  - Evaluation of system based on ARM v8 ISA in gem5 full system simulation
- **System stack exploration of Function-as-a-Service (FaaS) models** *(UT Austin, Sept 2018 - present)*
  - Micro-benchmarking of FaaS models on AWS on network, compute and memory metrics
  - Evaluate such services with emphasis on latencies and utilization
  - Understand orchestration tools like Kubernetes interaction with underlying infrastructure
  - Model hardware-assisted orchestration based on contention modeling of such applications

Past Projects

- **Low-power real-time object recognition SoC Design** *(SoC Design Project, Dr. A. Gerstlauer)*
  FPGA design and implementation of GEMM module of YOLO model
- **Verilog System Design for 32-bit x86 ISA subset** *(Microarchitecture Course Project, Dr. Yale Patt)*
  CPU Design of a pipelined machine with memory & branch predictor for subset of x86 ISA
- **Intelligent instruction duplication for Side-Channel Defence** *(Security Course Project, Dr. M. Tiwari)*
  Compiler solution for duplication of instructions which work on dummy data
- **Cache Block Replacement** *(Dr. Mainak Chaudhuri)*
  Replacement algorithm using age, frequency and re-use distance of a cache line.
- **Operating Systems Design on NachOS** *(OS Course Project, Prof. Mainak Chaudhuri)*

Relevant Courses

Computer Architecture	Data Structure and Algorithms	Microarchitecture
Operating Systems	Security in HW/SW Systems	Compiler

Work

- **Graduate Research Assistantship** at University of Texas at Austin, SPARK Labs (ECE) *(Spring 2018 - Current)*
- **Teaching Assistantship** at University of Texas at Austin for Operating Systems course *(Fall Semester 2017)*
- **Member of Technical Staff** at **VMware India** Software Pvt. Ltd *(2015 - 2017)*
  - IDF for system health monitoring tool using vSphere metrics
  - Public cloud cost analytics using utilization statistics
  - Microservices using Docker containers and Spark cluster for OTA updates to the application suite

Academic Endowments

- A **Kishore Vaigyanik Protsahan Yojana** scholarship Fellow by Department of Science and Technology, India.
- Awarded **1st** prize in the state of Orissa in the **Regional Mathematics Olympiad 2010-'11**
- Granted **National Talent Search Examination** academic excellence scholarship fellowship in **2007**.

Skills

- Languages: C, C++, Java, Verilog, Python
- Tools and Software: gem5, qemu, Vivado HLS, Matlab
- ISA: ARM v8, x86, MIPS, 8086
- Productivity tools: git, Latex