

EDUCATION

University of Toronto

MASc (research) in Computer Engineering, Advisor: Prof. Tarek Abdelrahman

Toronto, Canada

2018–2019, 2020–Current

College of Engineering, Pune

BTech in Computer Engineering

Pune, India

2011–2015

EXPERIENCE

University of Toronto

Graduate Research Student, Masters thesis

Toronto, Canada

August 2020–Current

- Compiler analysis and optimizations for FPGA overlay
- Currently designing and implementing analysis of the load and store instruction streams in the loop body using the LLVM framework
- Goal is to improve parallel execution performance for general purpose applications with emphasis on ML workloads on an FPGA overlay using novel compiler optimizations

University of Toronto

Graduate Research Student

Toronto, Canada

Summer 2019

- Leveraging determinism and NVM in main-memory databases to reduce DRAM footprint
- Studied performance and DRAM usage by placing different data objects on Intel's 3DXpoint NVM to understand bottlenecks
- Preliminary implementation and evaluation of ideas such as buffering in DRAM and writeback during garbage collection on NVM which improved the performance of the system by 1.7X

College of Engineering, Pune

Project Manager and Team Member

Pune, India

December 2011 to May 2015

- “Swayam” student satellite project
- The satellite was launched in space by the Indian Space Research Organization in 2016 and the mission has been successful
- Key responsibilities included design, implementation and testing of the On Board Computer software and hardware and overall team leadership in my final year
- Lead assembly and testing of the flight model of spacecraft and defended the Critical Design Review in the Indian Space Research Organization in 2014
- Contributed to system software including the low level drivers, scheduling, file system, boot loader for ARM controller based On Board Computer
- Integration of On Board Computer with the other sub-systems which include Load Protection, Terminal Node Controller of Communication, Gyroscope of Attitude Control System
- Design and implementation of OILS (On Board Computer In Loop Simulation) which includes simulating other components of the satellite other than On Board Computer for testing purpose

Zimetrics Technologies

RnD intern

Pune, India

April 2020 to August 2020

- Text extraction from application images for automation testing
- Design and implementation of automating visual inspection of mobile application screenshots and reports using AWS Textract

- Explored several approaches such as using bounding box feature of AWS Textract and computer vision techniques such as Hough-line transformation to detect text along with geometry to perform comparison of text with context

University of Texas, Austin

Pune, India

Remote research internship

October 2017 to November 2017

- Analyzing the Fragmented Log-Structured Merge (FLSM) data structure
- Explored effect of different configurable parameters such as guard size, number of sstables per level, size of levels on the read and write performance in FLSM based key-value store
- Compared FLSM with other data-structures such as Log Structure Merge (LSM), Be-Tree and B-Tree

TCS Research (TRDDC)

Pune, India

System Engineer

December 2016 to June 2018

- Crystal Ball privacy platform
- Design and development of “Crystal Ball” privacy platform project which aims at providing end users more control of the way their personal data is used
- Contributions include revamping Android mobile application interface, building consent management platform and participating in re-designing of the product

IBM India Software Lab

Pune, India

Software Developer

July 2015 to November 2016

- IBM Cloud Orchestrator
- Development and support of a cloud orchestration and automation product called “ICO” (IBM Cloud Orchestrator)
- Contributed to ICO core task engine, IBM BPM toolkits for implementing automation service layer and product integration with Openstack, Hypervisors (like VMWare, KVM), other public clouds (AWS, Azure, Softlayer)

TEACHING

- **Teaching Assistant** at the University of Toronto
Operating Systems (ECE 344)

Fall 2018

1. Assisted students in lab assignments
2. Marked Midterm and final exam papers

PUBLICATIONS

1. COEPSAT Protocol: A Modular Link and Network Layer Protocol for Small Satellites , International Astronautical Congress 2014, Toronto, Canada
2. A Generic, Customizable, Fault Tolerant Load Protection System for Small Satellites , IEEE International Conference on Power Electronics, Drives and Energy Systems 2014, Mumbai, India
3. Project Management and Implementation of Hardware and Software Interfaces between Subsystems of Swayam Student Satellite Initiative, International Astronautical Congress 2015, Jerusalem, Israel

SKILLS

- **Programming Languages:** C, C++, Python, Java, Linux shell scripting
- **Compilers:** LLVM
- **Assembly:** Basics of ARM and Intel x86
- **Protocols and drivers:** UART, SPI, I2C
- **Cloud:** Openstack, KVM, VMWare

SCHOLARSHIPS AND AWARDS

- ECE Graduate Fellowship@UofT 2020–2021
- Scholarship for attending the SOSP conference 2019
- ECE Graduate Fellowship@UofT 2018–2019
- Gandhian Young Technological Innovation (GYTI) Award to the “Swayam” satellite team 2017
- Ranked 21st in the Engineering entrance test (MH-CET) in the state of Maharashtra, India 2011