

EDUCATION

National University of Singapore, Singapore

- Doctor of Philosophy (*Ph.D.*) in Computer Science *Jan 2019 – Nov 2024*
 - Thesis: Accelerating the Evaluation of Large Workloads on Post-Dennard Systems with Sampling
 - Advisor: Dr. Trevor E. Carlson
 - Areas: CPU Microarchitecture, Workload Characterization, Dynamic Program Analysis, Performance Modeling and Measurements, Simulation Infrastructure, Heterogeneous Systems

Birla Institute of Technology & Science, Pilani, Rajasthan, India

- Master of Engineering (*M.E.*) in Computer Science *Aug 2014 – May 2016*
 - Thesis: Performance Improvement of Multicore Scheduler in Real-Time Mixed Criticality Systems
 - Advisor: Dr. Biju K. Raveendran
 - Selected coursework: Advanced Computer Architecture, Advanced Algorithms and Complexity, Advanced Operating Systems, Cloud Computing, Data Mining, Real-time Systems.

University of Kerala, Thiruvananthapuram, Kerala, India

- Bachelor of Technology (*B.Tech.*) in Computer Science and Engineering *Aug 2009 – Dec 2013*
 - FYP: Online Object Recognition from Images using Kohonen Neural Networks

WORK EXPERIENCE

Intel Corporation, Massachusetts, USA

- Research Intern *Jul 2022 – Dec 2022*
 - Host: Dr. Harish Patil
 - Representative region validation using performance counters, sampling and performance analysis of heterogeneous CPU-GPU workloads

National University of Singapore, Singapore

- Research Intern *Nov 2018 – Jan 2019*
 - Host: Dr. Trevor E. Carlson

NetApp, Bengaluru, India

- Member Technical Staff II *Jul 2016 – Nov 2018*
 - Performance modeling of data storage devices, empirical analysis of storage protocols and workloads

PUBLICATIONS

WORKS IN PROGRESS

- [1] [Alen Sabu](#), Harish Patil, Changxi Liu, Wim Heirman, and Trevor E. Carlson, “XPU-Point: Sampling Methodology to Accelerate Simulation of Heterogeneous CPU-GPU Workloads” (Submitted)
- [2] [Alen Sabu](#), Zhantong Qiu, Harish Patil, Wim Heirman, Jason Lowe-Power, and Trevor E. Carlson, “Accelerated Simulation of Parallel Workloads using Loop-Bounded Checkpoints” (Ongoing)

CONFERENCES & JOURNALS

- [1] Changxi Liu*, [Alen Sabu](#)*, Akanksha Chaudhari, Qingxuan Kang, and Trevor E. Carlson, “Pac-Sim: Simulation of Multi-threaded Workloads using Intelligent, Live Sampling.” in *ACM Transactions on Architecture and Code Optimization (TACO)*, Jun 2024
- [2] [Alen Sabu](#)*, Changxi Liu*, and Trevor E. Carlson, “Viper: Utilizing Hierarchical Program Structure to Accelerate Multi-core Simulation.” in *IEEE Access*, Jan 2024
- [3] [Alen Sabu](#), Harish Patil, Wim Heirman, and Trevor E. Carlson, “LoopPoint: Checkpoint-driven Sampled Simulation for Multi-threaded Applications,” in *The 28th IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, Apr 2022
- [4] Harish Patil, Alexander Isaev, Wim Heirman, [Alen Sabu](#), Ali Hajiabadi, and Trevor E. Carlson, “ELFies: Executable Region Checkpoints for Performance Analysis and Simulation,” in *The 19th International Symposium on Code Generation and Optimization (CGO)*, Mar 2021
- [5] [Alen Sabu](#), Biju Raveendran, and Rituparna Ghosh, “SMILEY: A Mixed-Criticality Real-Time Task Scheduler for Multicore Systems,” in *The 22nd International Symposium on Distributed Simulation and Real Time Applications (DS-RT)*, Oct 2018 (*Nominated best paper*)

* *Joint first authors*

WORKSHOPS & POSTERS

- [1] Alen Sabu, Harish Patil, Wim Heirman, and Trevor E. Carlson, “ROIperf: A Framework to Rapidly Validate Workload Sampling Methodologies,” in *The 1st Workshop on Computer Architecture Modeling and Simulation (CAMS)*, Oct 2023
- [2] Alen Sabu, Harish Patil, Wim Heirman, Alexander Isaev, and Trevor E. Carlson, “Approaching a High-Performance, General-Purpose Multi-Threaded Sampling Methodology,” in *The 2nd Young Architect Workshop (YArch)*, Mar 2020

TUTORIALS & TALKS

- [1] “Release of Sniper v8.1 and Guide on Common Simulation Practices”
 - The 2nd Workshop on Computer Architecture Modeling and Simulation (CAMS) Nov 2024
- [2] “The gem5 Tutorial: Public Release of SPEC CPU2017 ELFies for Simulation on gem5”
 - The 51st International Symposium on Computer Architecture (ISCA) Jun 2024
- [3] “LoopPoint Tools: Sampled Simulation of Complex Multi-threaded Workloads using Sniper and gem5”
 - The 29th International Symposium on High-Performance Computer Architecture (HPCA) Feb 2023
- [4] “Studies in Selection and Validation of Regions of Interest in Heterogeneous CPU-GPU Workloads”
 - VSSAD Seminar, Intel Corporation, MA, USA Dec 2022
- [5] “LoopPoint and ELFies: Tools and Techniques to Accelerate Architecture Simulations of Complex Multi-threaded Applications using Checkpointing”
 - The 49th International Symposium on Computer Architecture (ISCA) Jun 2022
 - International Symposium on Performance Analysis of Systems & Software (ISPASS) May 2022
- [6] “LoopPoint: Checkpoint-Driven Sampled Simulation for Multi-threaded Applications”
 - VSSAD Seminar, Intel Corporation, MA, USA Mar 2022

OPEN-SOURCE PROJECTS

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| ▪ LoopPoint Methodology | ▪ Sniper Simulator | ▪ ELFie Checkpointing |
| 📄 Main developer | 📄 Maintainer | 📄 Contributor |
| 🔗 github.com/nus-comparch/looppoint | 🔗 github.com/snipersim/snipersim | 🔗 github.com/intel/pinball2elf |

SKILLS

C, C++, Python, Bash, L^AT_EX, Git, Docker, GDB, Intel Pin, Intel GTPin, NVIDIA NVBit, Sniper, gem5

AWARDS

- Travel grant for the 56th International Symposium on Microarchitecture (MICRO’23), Canada
- Research Achievement Award 2021/2022 from the School of Computing, National University of Singapore
- Travel grant for the 49th International Symposium on Computer Architecture (ISCA’22), USA
- Travel grant for the 2nd Young Architect Workshop at ASPLOS’20, Switzerland
- NUS Graduate Research Scholarship, National University of Singapore Jan 2019 – Till date
- BITS Higher Degree Scholarship, Birla Institute of Technology & Science, Pilani Aug 2014 – May 2016

PROFESSIONAL SERVICE

- Member of Artifact Evaluation Committee for IEEE/ACM MICRO 2023
- Member of Program Committee on posters/short-papers for IEEE IISWC 2023
- Member of Artifact Evaluation Committee for IEEE/ACM CGO 2023
- Reviewing member for Master of Computing admissions in School of Computing, NUS 2021

TEACHING AND MENTORING

- Research Mentor for Jikun Zhang at NUS on integrating ML models in Sniper Fall 2024
- Research Mentor for Qingxuan Kang at NUS on improving sampled simulation techniques Summer 2021
- Teaching Assistant for CS2030 Programming Methodology II at NUS Spring 2021
- Teaching Assistant for CS2106 Introduction to Operating Systems at NUS Fall 2020
- Teaching Assistant for CS1010E Programming Methodology at NUS Spring 2020
- Teaching Assistant for CSF111 Computer Programming at BITS-Pilani Spring 2016, Spring 2015
- Teaching Assistant for CSF342 Computer Architecture at BITS Pilani Fall 2015

REFERENCES

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