ALEN SABU *he/him* 11 Research Link, Singapore 119391
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EDUCATION

National University of Singapore, Singapore

- Doctor of Philosophy (*Ph.D.*) in Computer Science *Jan 2019 – Dec 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

Arm Holdings, Cambridge, UK

- Staff Performance Engineer *Feb 2025 – Till date*
  - Design and develop methodologies for the sample selection of multi-core ARM workloads

Intel Corporation, Massachusetts, USA

- Research Intern *Jul 2022 – Dec 2022*
  - Host: Dr. Harish Patil
  - Sample validation using performance counters, performance analysis of heterogeneous workloads

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, "Simulator-Agnostic Sample Selection Methodology for Heterogeneous CPU-GPU Applications" (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" (Submitted)

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

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

SKILLS

C, C++, Python, Bash, LaTeX, 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

- **Dr. Trevor E. Carlson**
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  National University of Singapore
  Singapore
  tcarlson@comp.nus.edu.sg
- **Dr. Harish Patil**
  Principal Engineer
  Intel Corporation
  USA
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- **Dr. Wim Heirman**
  Principal Engineer
  Intel Corporation
  Belgium
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