

Kirshanthan Sundararajah

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EDUCATION

- Purdue University, West Lafayette, IN. Aug 2015 - Dec 2022
Ph.D. in Electrical and Computer Engineering
M.S. in Electrical and Computer Engineering
- University of Moratuwa, Katubedda, Sri Lanka. Jul 2009 - Mar 2014
B.Sc.(Hons) in Electronics and Telecommunication Engineering

PROFESSIONAL EXPERIENCE

- **Graduate Research Assistant @Purdue University** Aug 2015 - Present
PLCL Group
 - **(Poly/Uni)Rec**: Framework for composing transformations for nested recursion and loops.
 - **SparseLNR**: Accelerating sparse tensor computation.
 - **DARM**: Framework for melding similar control-flow graphs.
 - **HACCLE**: An ecosystem for *Secure Multi-Party Computations*.
 - **TreeFuser/Grafter**: Framework for fusing general recursive traversals over heterogeneous trees.
 - **Treelogy**: Benchmark suite for tree traversals.
- **Software Engineering Intern @Nvidia** Sep 2020 - Dec 2020
GPU Compiler Group
 - **Diesel Compiler**: Warp specialization and pipelining for GPU kernels.
- **Software Engineering Intern @Reservoir Labs** June 2020 - Aug 2020
R-Stream Compiler Group
 - **ParSEC Backend**: A task-based runtime backend for *R-Stream* polyhedral compiler.
- **Research Intern @Microsoft Research** June 2018 - Sep 2018
RiSE Group
 - **Parallelizing Word2Vec**: Parallelizing and scaling *Word2Vec* training to execute on many cores.
- **Associate Electronic Engineer @Zone24x7 Inc.** May 2012 - Oct 2012
Signs24x7 Group
 - **Image Compression Algorithm**: Implementation of memory efficient image compression algorithm, supposed to perform decompression on an *STM32 microcontroller* based system.
 - **Clock Synchronization Algorithm**: Implementation of real-time clock synchronization algorithm, deployed on an *ARM microprocessor* runs *embedded Linux*.
 - **Hardware Abstraction Layer**: Implementation of *Hardware Abstraction Layer (HAL)* for radio communication protocol stack of *Electronic Paper Display (EPD)*, driven by an *STM32 microcontroller*.

PUBLICATIONS

- A Dias, **K Sundararajah**, C Saumya, and M Kulkarni "SparseLNR: Accelerating Sparse Tensor Computations Using Loop Nest Restructuring" in *International Conference on Supercomputing, ICS 2022*.
🏆 **Best Paper Award** [ACM DL]
- C Saumya, **K Sundararajah**, and M Kulkarni "DARM: Control-Flow Melding for SIMT Thread Divergence Reduction" in *International Conference on Code Generation and Optimization, CGO 2022*. [IEEE Xplore]
- Y Bao*, **K Sundararajah***, R Malik, Q Ye, C Wagner, N Jaber, F Wang, M H Ameri, D Lu, A Seto, B Delaware, R Samanta, A Kate, C Garman, J Blocki, P Letourneau, B Meister, J Springer, T Rompf, and M Kulkarni "HACCLE: Metaprogramming for Secure Multi-Party Computation" in *International Conference on Generative Programming: Concepts and Experiences, GPCE 2021*. [ACM DL]
- **K Sundararajah** and M Kulkarni "Composable, Sound Transformations of Nested Recursion and Loops" in *Programming Languages, Design and Implementation, PLDI 2019*. [ACM DL]
- L Sakka, **K Sundararajah**, R R Newton, and M Kulkarni "Sound, Fine-Grained Traversal Fusion for Heterogeneous Trees" in *Programming Languages, Design and Implementation, PLDI 2019*. [ACM DL]
- L Sakka, **K Sundararajah** and M Kulkarni "TreeFuser: A Framework for Analyzing and Fusing General Recursive Tree Traversals" in *Object-Oriented Programming, Systems, Languages, and Applications, OOPSLA 2017*. [ACM DL]
- N Hegde, J Liu, **K Sundararajah**, and M Kulkarni "Treelogy: A Benchmark Suite for Tree Traversals" in *IEEE International Symposium on Performance Analysis of Systems and Software, ISPASS 2017*. [IEEE Xplore]
- **K Sundararajah**, L Sakka, and M Kulkarni "Locality Transformations for Nested Recursive Iteration Spaces" in *Architectural Support for Programming Languages and Operating Systems, ASPLOS 2017*. [ACM DL]
- **K Sundararajah** and S Jayasena, "Model-based Input-adaptive Vectorization" in *Moratuwa Engineering Research Conference, MERCon 2016*. [IEEE Xplore]
- **K Sundararajah**, L Logeswaran, P N D Panagoda, L P Wijesinghe, D V S X De Silva, and A A Pasqual, "Layered Depth Image Based HEVC Multi-view Codec" in *Advances in Visual Computing: Proceedings of the International Symposium on Visual Computing, ISVC 2014*. [Springer]

TEACHING EXPERIENCE

- ECE 368 Data Structures [Instructor] @Purdue University Summer 2021 and Summer 2022
- ECE 295 Introduction to Data Science [TA] @Purdue University Summer 2019 and Fall 2020
- CS 1032 Programming Fundamentals [TA] @University of Moratuwa Mar 2014 - Jun 2015

SERVICE

- Registration Chair for PPOPP 2023.
- Member of Project for Inclusion in ECE (PIECE) Committee 2022.
- Member of External Review Committee (ERC) for OOPSLA 2022.
- Member of Artifact Evaluation Committee (AEC) for OOPSLA 2022.

- Member of Artifact Evaluation Committee (AEC) for PLDI 2020.
- Member of Program Committee (PC) for Doctoral Symposium at ECOOP 2019.
- External collaborative reviewer for POPL 2019.
- Student volunteer for PLDI 2016, SPLASH 2018, PLDI 2019, and SPLASH 2021.
- Co-organizer of PurPL weekly seminar (Fall 2017 - Spring 2021) and volunteer for PurPL Fest 2019.

ACHIEVEMENTS

- **Awards**

- *Best Paper Award* at International Conference on Supercomputing (ICS) 2022.
- *Bilsland Dissertation Fellowship 2021-2022*, Purdue University.
- *Electrical and Computer Engineering Fellowship 2015-2016*, Purdue University.
- *V. K. Samaranyake Research Assistantship 2014-2015*, University of Moratuwa.
- *Mahapola Merit Scholarship 2009-2014*, University of Moratuwa.

- **Grants**

- ACM Travel Grant to Attend *PLDI 2019*.
- ACM Travel Grant to Attend *SPLASH 2018*.
- ACM Travel Grant to Attend *ASPLOS 2017*.
- ACM Travel Grant to Attend *PLDI 2016*.
- ACM Travel Grant to Attend *CGO 2015*.

- **Competitions**

- *Silver Medal* in ACM Student Research Competition at *SPLASH 2018*.
- Placed 25th, 34th, 29th, and 45th in *IEEEExtreme 7.0, 6.0, 5.0 and 4.0*, respectively.
- Placed 4th in *Sri Lanka Robot Competition (SLRC) 2012*.
- Champions of *Inter-University Statistics Quiz Competition 2010*, University of Colombo, Sri Lanka.
- Participated at *International Mathematics Olympiad Competition(IMO) 2009*, Bremen, Germany