Tharindu Patabandi

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EDUCATION

University of Utah, Salt Lake City, USA

- PhD in Computer Science, GPA 3.9 — Fall 2015 – 2022 (expected)

University of Moratuwa, Sri Lanka

- B.Sc.Eng (First-Class honours) — Jul 2010 – Apr 2015

RESEARCH EXPERIENCE

School of Computing, University of Utah

- Graduate Research Assistant — Fall 2015 – 2022
  Compiler-driven loop optimization using performance models and high-performance code generation for tensor applications. Both analytical and predictive approaches have been explored for target tensor applications like CNNs. *Advisor*: Mary Hall

Intel Labs, Santa Clara, CA

- Graduate Research Intern (Machine Programming Research) — Summer 2020
  Researched predictive optimizations for data locality optimization of deep loop nest computations. Implemented an MLIR-based compiler infrastructure to accommodate optimization models to drive code generation. *Mentors*: Anand Venkat, Justin Gottschlich
- Graduate Research Intern (Parallel Computing Lab) — Summer 2017
  Developed analytical models to capture cache and memory behavior of CNN operators for high-performance AVX-512 code generation. *Mentors*: Anand Venkat, Rajkishore Barik

Department of Comp. Sci. & Engineering, University of Moratuwa

- Final Year Research — Apr 2014 – Mar 2015
  Developed a search-driven autotuning system to optimize JVM runtime. *Advisors*: Sanath Jayasena, Saman Amarasinghe

TEACHING EXPERIENCE

School of Computing, University of Utah

- Teaching Assistant — Spring 2017, Spring 2018
  CS 4230 Parallel Programming
  CS 5470 Compiler Principles and Techniques

Department of Comp. Sci. & Engineering, University of Moratuwa

- Visiting Instructor — Jun 2014 – Aug 2015
  CS 1032 Programming Fundamentals, CS 2042 Operating Systems,
  CS 3042 Database Systems, CS 4522 Advanced Algorithms

SELECT PUBLICATIONS

PAPERS

- Tharindu Patabandi et. al., Learning data locality optimizations with linear-time training data generation. 2022 (submitted for peer review)
- Tharindu R. Patabandi, Anand Venkat, Abhishek Kulkarni, Pushkar Ratnalikar, Mary Hall, and Justin Gottschlich. Predictive data locality optimization for higher-order tensor computations. In Proceedings of the 5th ACM SIGPLAN International Symposium on Machine Programming (MAPS) 2021.

- Patabandi, T. R., Venkat, A., Barik, R., Hall, M. W. *SWIRL++*: Evaluating Performance Models to Guide Code Transformation in Convolutional Neural Networks. In Workshops on Languages and Compilers for Parallel Computing (LCPC) 2019.
- Anand Venkat, Tharindu Rusira, Rajkishore Barik, Mary Hall, and Leonard Truong, *SWIRL*: High-performance many-core CPU code generation for deep neural networks. The International Journal of High Performance Computing Applications (IJHPCA) 2019.

POSTERS

- Tharindu Rusira, Anand Venkat, Rajkishore Barik, and Mary Hall, SWIRL : Automatic High-Performance CPU code generation for Convolutional Neural Networks using Model-based Search, (LCPC) 2018
- Tharindu Rusira, Mary Hall, Leveraging Performance of Geometric Multigrid with Parameter Autotuning, PhD Forum at Parallel and Distributed Processing Symposium (IPDPS), 2016
- Tuowen Zhao, Tharindu Rusira, Kahlid Ahmed, Mary Hall, A Novel Variable-Blocking Representation for Efficient Sparse Matrix-Vector Multiply on GPUs, International Conference for High Performance Computing, Networking, Storage, and Analysis (SC) 2016

OTHER WORK EXPERIENCE

Google Summer of Code 2014

- Arches Project — Summer 2014

Zaizi Asia, Colombo, Sri Lanka

- Software Engineer Intern — Nov 2013 – Apr 2014

GRADUATE COURSEWORK

CS 6150 Advanced Algorithms, CS 6210 Advanced Scientific Computing I, CS 6235 Parallel Programming for Many-Core Architectures, CS 6460 Operating Systems, CS 6810 Computer Architecture, CS 6960 Advanced Compilers, CS 6961 Structured Prediction, CS 6966 Theory of Machine Learning, CS 7960 Neuromorphic Architectures

TECHNICAL SKILLS

Python, C++, LLVM/MLIR, PyTorch, Vim, LaTeX

AWARDS

- NSF/IEEE-TCPP Student Travel Award (IPDPS'16) — 2016
- Gold Prize, ACM Student Research Competition (CGO undergrad) — 2015
- ACM SIGMICRO Travel Grant (CGO'15) — 2015
- NSF/IEEE-TCPP Student Travel Award (IPDPS'15) — 2015
- Dean's List, Faculty of Engineering, University of Moratuwa — 2012 – 2015

REFERENCES

Available upon request