TIAN JIN

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WORK EXPERIENCE

IBM Thomas J. Watson Research Center, Yorktown Heights, NY June 2017 - Aug 2020
Research Software Engineer, Advanced Compiler Technologies Group

- Technical lead for delivering real-time deep learning model inference capability on IBM z14/15 through advanced compiler technologies (Research blog article).
- This project is recognized by an IBM Research Achievement Award.
- Active contributor of Tensorflow, OpenMP (in Clang/LLVM) and ONNX (Open Neural Network Exchange), each with at least thousands of lines of code contribution.

IBM Thomas J. Watson Research Center, Yorktown Heights, NY June - August 2016
Research Intern, Advanced Compiler Technologies Group

- Designed and implemented algorithms supporting OpenMP reduction directive on NVidia GPU in Clang/LLVM as part of the compiler project for IBM Summit supercomputer debuted in 2018, currently the most powerful supercomputer.

Colorado State University, Fort Collins, CO June - August 2015
Research Assistant, Advised by Professor Sanjay Rajopadhye

- Worked on AlphaZ schedule verification (a polyhedral-model based compiler system).
- Developed and published short paper about using hybrid schedules (static polyhedral schedule + dynamic graph-based schedule) to outperform programs optimized with static polyhedral schedules only.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA *August 2020 -*
Ph.D. Student
Department of Electrical Engineering and Computer Science

Haverford College, Haverford, PA *August 2013 - May 2017*
Bachelor of Science in Computer Science and Mathematics
Department Honor in Computer Science

AWARD

MIT Robert J. Shillman Fellowship 2020

- $99K awarded by the MIT EECS department.

IBM Research Achievement Award December 2019

- Awarded by IBM Research for my leading contribution to AI model inference enablement and acceleration on IBM Z14 and Z15 Platforms.

IBM Open Source Community Leader Award September 2018

- Awared by IBM for my leading contribution of ONNX-Tensorflow open source project.
- https://github.com/onnx/onnx-tensorflow (1K+ Github stars).

CRA Outstanding Undergraduate Researcher Award Finalist 2016

- This award recognizes outstanding undergraduate researchers attending North American universities.

PUBLICATION

[1] Tian Jin, Michael Carbin, Daniel M. Roy, Jonathan Frankle, and Gintare Karolina Dziugaite. "Pruning′s Effect on Generalization Through the Lens of Training and Regularization". In: *Advances in Neural Information Processing Systems*. 2022.

[2] Luke Anderson, Andrew Adams, Karima Ma, Tzu-Mao Li, Tian Jin, and Jonathan Ragan-Kelley. "Efficient Automatic Scheduling of Imaging and Vision Pipelines for the GPU". In: *Object-oriented Programming, Systems, Languages, and Applications*. 2021.

[3] Tian Jin*, Zhun Liu*, Shengjia Yan, Alexandre Eichenberger, and Louis-Philippe Morency. "Language to network: Conditional parameter adaptation with natural language descriptions". In: *Annual Meeting of the Association for Computational Linguistics*. 2020.

[4] Tian Jin and Seokin Hong. "Split-CNN: Splitting Window-based Operations in Convolutional Neural Networks for Memory System Optimization". In: *International Conference on Architectural Support for Programming Languages and Operating Systems*. 2019.

[5] Tian Jin, Nirmal Prajapati, Waruna Ranasinghe, Guillaume Iooss, Yun Zou, Sanjay Rajopadhye, and David G. Wonnacott. "Hybrid Static/Dynamic Schedules for Tiled Polyhedral Programs". In: *arXiv preprint arXiv:1610.07236* (2016).

[6] David Wonnacott, Tian Jin, and Allison Lake. "Automatic tiling of "mostly-tileable" loop nests". In: *5th International Workshop on Polyhedral Compilation Techniques*. 2015.

[7] Arpith Chacko Jacob, Alexandre E Eichenberger, Hyojin Sung, Samuel F Antao, Gheorghe-Teodor Bercea, Carlo Bertolli, Alexey Bataev, Tian Jin, Tong Chen, Zehra Sura, Georgios Rokos, and Kevin O'Brien. "Efficient Fork-Join on GPUs Through Warp Specialization". In: *2017 IEEE 24th International Conference on High Performance Computing (HiPC)*. 2017.

[8] Samuel F. Antao, Alexey Bataev, Arpith C. Jacob, Gheorghe-Teodor Bercea, Alexandre E. Eichenberger, Georgios Rokos, Matt Martineau, Tian Jin, Guray Ozen, Zehra Sura, Tong Chen, Hyojin Sung, Carlo Bertolli, and Kevin O'Brien. "Offloading Support for OpenMP in Clang and LLVM". In: *Workshop on the LLVM Compiler Infrastructure in HPC*. 2016.

[9] Matt Martineau, Simon McIntosh-Smith, Carlo Bertolli, Arpith C. Jacob, Samuel F. Antao, Alexandre Eichenberger, Gheorghe-Teodor Bercea, Tong Chen, Tian Jin, Kevin O'Brien, Georgios Rokos, Hyojin Sung, and Zehra Sura and. "Performance Analysis and Optimization of Clang's OpenMP 4.5 GPU Support". In: *International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems*. 2016.

TEACHING EXPERIENCE

New York University, New York City, New York Oct 2019

- Guest lecturer in High-Performance Machine Learning class.
- Taught various flavors of implementation of convolution kernels (im2col, fft and winograd).