Yunming Zhang

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Education

Massachusetts Institute of Technology   June 2014- May 2020 (Expected)
Doctor of Philosophy in Computer Science, Cumulative GPA: **5.0/5.0**
Advisors: Prof. Saman Amarasinghe, Julian Shun
Focus: Programming Languages, Compilers, Parallel Computing, Graph Analytics

Rice University, Houston, Texas   May 2013 - May 2014
Master of Science in Computer Science, Cumulative GPA: **4.0/4.33**
Advisors: Prof. Vivek Sarkar, Alan Cox
Thesis Title: Optimized Runtime Systems for Multi-core Clusters

Rice University, Houston, Texas   May 2009 - May 2013
Bachelor of Science in Computer Science
Cumulative GPA: **3.99/4.33, Magna Cum Laude**

Publications

GraphIt – A High-Performance DSL for Graph Analytics
Yunming Zhang, Mengjiao Yang, Riyadh Baghdadi, Shoaib Kamil, Julian Shun, Saman Amarasinghe

- Object-oriented Programming, Systems, Languages, and Applications (*OOPSLA*) 2018
- https://graphit-lang.org/

Making Caches Work for Graph Analytics
Yunming Zhang, Vladimir Kiriansky, Charith Mendis, Matei Zaharia, Saman Amarasinghe

- IEEE International Conference on Big Data (*BigData*) 2017 *Best Student Paper*

Tiramisu: a polyhedral compiler for expressing fast and portable code
Riyadh Baghdadi, Jessica Ray, Malek Ben Romdhane, Emanuele Del Sozzo, Abdurrahman Akkas, **Yunming Zhang**, Patricia Suriana, Shoaib Kamil, Saman Amarasinghe

- International Symposium on Code Generation and Optimization (*CGO*) 2019

Optimizing Indirect Memory References with Milk
Vladimir Kiriansky, **Yunming Zhang,** Saman Amarasinghe

- International Conference on Parallel Architectures and Compilation Techniques (*PACT*) 16

HJ-Hadoop: An Optimized MapReduce Runtime for Multi-core Systems.
Yunming Zhang, Alan Cox, Vivek Sarkar.
- 5th USENIX Workshop on Hot Topics in Parallelism (*HotPar* '13). June 2013. [poster with paper]

Experience

Massachusetts Institute of Technology Computer Science Department   **June 2014 – Present**
Research Assistant   **Advisor: Prof. Saman Amarasinghe**

- My focus is on improving the programmability and performance of high-performance applications on Sparse Data (Graphs and Sparse Matrices).
- Led the design and implementation of **GraphIt,** a domain specific language for writing high-performance graph analytics. GraphIt is currently used by other universities, and evaluated by a few companies.
- Led the implementation of a new cache-optimized graph analytics library, **Cagra**, which proposed novel optimization techniques, Graph Reordering and CSR segmenting (cache blocking for graphs).

Rice University Computer Science Department   **Aug 2011 – Present**
Research Assistant, Habanero Multi-core Software Group   **Advisor: Prof. Vivek Sarkar**

- Designed and implemented the HJ-Hadoop MapReduce runtime. It integrates Habanero Java's shared memory model into the Hadoop MapReduce runtime's distributed memory model.

IBM Research Lab, Austin   **May 2013 – Aug 2013**
Research Intern, Distributed High performance Key-Value Store   **Mentor: Dr. Juan Rubio**

- Designed and implemented the query API for the key-value store.

Microsoft, Redmond   **May 2012 – Aug 2012**
Software Developer Engineering Intern, Azure Data Market Team   **Manager: David Shiflet**

- Improved search functionalities to match user interest with data or application offered by Azure Data Market.

Teaching Assistants (MIT and Rice)

- MIT: *Performance Engineering of Software Systems (6.172)*
- Rice: *Fundamentals of Parallel Computing* (COMP 322) for 2 semesters. *Advanced Object Oriented Computing* (COMP 310), *Computational Thinking* (COMP 140).

Awards and Honors

- Best Student Paper, BigData 17 (2017)
- Third place, Undergraduate, ACM Student Research Competition at SPLASH 13 (2013)
- Research Fellowship for Master of Science in Computer Science (2013)