

# YUFEI DING

3511-201 Ivy Commons Dr,  
Raleigh NC, 27606  
Yufei's homepage

Phone: 757-634-1478  
Email: yding8@ncsu.edu  
Alt: ydingxm@gmail.com

## Research Interests

My research interest resides at the intersection of Compiler Technology and (Big) Data Analytics, with a focus on enabling Higher-Level Program Optimizations for data analytics and other data-intensive applications. My research pioneers the efforts of raising the level of program optimizations from implementations to algorithms, and from instructions to formulas.

## Education

- |                |  |
|----------------|--|
| 2014 – present | <b>Ph.D. in Computer Science</b> , North Carolina State University, USA.<br>Advisor: Dr. Xipeng Shen                                 |
| 2012 – 2014    | <b>Ph.D. in Computer Science</b> , College of William and Mary, USA.<br>Transfer to North Carolina State University with my advisor. |
| 2009 – 2011    | <b>M.S. in Physics</b> , College of William and Mary, USA.<br>Advisor: Dr. Gunter Luepke.  |
| 2005 – 2009    | <b>B.S. in Physics</b> , University of Science and Technology of China, China.<br>Advisor: Dr. Zejun Ding.                           |

## Research Experience

- |                |  |
|----------------|--|
| 2014 – present | Research Assistant, <b>North Carolina State University</b> .<br>Advisor: Dr. Xipeng Shen.<br>Generalize algorithmic optimization based on triangular inequality to a class of data analytics algorithms (e.g., KMeans, KNN, RBM), boosting their performance by one or two orders of magnitude. (Published in [ICML'15, VLDB'15].) |
| Summer 2015    | Research Intern, <b>Microsoft Research, Redmond</b> .<br>Mentors: Todd Mytkowicz, Madan Musuvathi.<br>Parallelize stochastic gradient descent (SGD) through symbolic execution, which yields 13X speedup over a heavily optimized sequential baseline on 16 cores. (This work was submitted for patent by Microsoft.)              |
| Summer 2012    | Visiting Research Student, <b>Massachusetts Institute of Technology</b> .<br>Mentor: Saman Amarasinghe.<br>Design two-level learning framework for algorithmic selection, where the best autotuned configuration/algorithm is selected for different input sets. (Published in [PLDI'15].)   |
| 2012 – 2014    | Research Assistant, <b>College of William and Mary</b> .<br>Advisor: Dr. Xipeng Shen.<br>Investigate compilation scheduling policy for JIT(just-in-time) compiler optimization, and propose a heuristic algorithm that yields near optimal schedules and explores the relations with JIT designs. (Published in [ASPLOS'14]. )     |

## Publications

- [*ICML'15*] **Yufei Ding**, Yue Zhao, Xipeng Shen, Madan Musuvathi, Todd Mytkowicz, “Yinyang K-Means: A Drop-In Replacement of the Classic K-Means with Consistent Speedup”, the 32nd International Conference on Machine Learning, Lille, France, July, 2015.
- [*VLDB'15*] **Yufei Ding**, Xipeng Shen, Madan Musuvathi, Todd Mytkowicz, “TOP: A Framework for Enabling Algorithmic Optimizations for Distance-Related Problems”, the 41st International Conference on Very Large Data Bases, Kohala Coast, Hawaii, August, 2015.
- [*PLDI'15*] **Yufei Ding**, Jason Ansel, Kalyan Veeramachaneni, Xipeng Shen, Una-May O’Reilly, Saman Amarasinghe, “Autotuning Algorithmic Choice for Input Sensitivity”, the 36th annual ACM SIGPLAN conference on Programming Language Design and Implementation, Portland, Oregon, June, 2015.
- [*ASPLOS'14*] **Yufei Ding**, Mingzhou Zhou, Zhijia Zhao, Sarah Eisenstat, Xipeng Shen, “Finding the Limit: Examining the Potential and Complexity of Compilation Scheduling for JIT-Based Runtime Systems”, the 19th International Conference on Architectural Support for Programming Languages and Operating Systems, Salt Lake City, March, 2014.
- [*OOPSLA'14*] Zhijia Zhao, Bo Wu, Mingzhou Zhou, **Yufei Ding**, Jianhua Sun, Xipeng Shen, Youfeng Wu, “Call Sequence Prediction through Probabilistic Calling Automata”, SPALSH/OOPSLA, Portland, Oct, 2014.
- [*CGO'13*] Mingzhou Zhou, Bo Wu, **Yufei Ding**, Xipeng Shen, “ProfMig: The First Framework for Migrating Program Profiles Across Software Versions”, International Symposium on Code Generation and Optimization, Shenzhen, China, Feb, 2013.

## Professional Services

Conference Paper Reviewer	ASPLOS'16, PACT'16, ICS'16, CC'16, ASPLOS'15, SC'15, PPOPP'15, CGO'15, IPDPS'15, WolfHPC'15, PACT'14, PLDI'14.
Journal Reviewer	TACO'16, JMLR'16.
Organizing Volunteer	LCPC'15.

## Talks & Presentations

- 2015 Intern Talk at Microsoft Research, Redmond, WA.
- 2015 VLDB'15, 41st International Conference on Very Large Data Bases, Kohala Coast, Hawai'i.
- 2015 PLDI'15, 36th Annual ACM SIGPLAN Conference on Programming Language Design and Implementation, Portland, OR.
- 2014 ASPLOS'14, Nineteenth International Conference on Architectural Support for Programming Languages and Operating Systems, Salt Lake City, Utah.

## Teaching Experience

Fall 2016	Guest Lectures on CSC512 Compiler Construction Course, Raleigh, NC.
Spring 2016	Guest Lectures on CSC766 Code Optimization for Programs Course, Raleigh, NC.
Fall 2015	Guest Lectures on CSC512 Compiler Construction Course, Raleigh, NC.
Spring 2015	Guest Lectures on CSC766 Code Optimization for Programs Course, Raleigh, NC.
Spring 2013	Teaching Assistant, CSci 141 Computational Problem Solving in Python.
Fall 2012	Lab Instructor, CSci 141 Computational Problem Solving in Python.
Spring 2012	Teaching Assistant, CSci 131 Concepts of Computer Science.

## Awards

2016	NCSU Computer Science Outstanding Research Award.
2015	NSF Travel Grants / PLDI'15.
2014	NSF Travel Grants / ASPLOS'14.
2006	Huawei Outstanding Student Scholarship.
2005-2009	Annual Outstanding Undergraduate Student Scholarship.

## References

Dr. Xipeng Shen Associate Professor North Carolina State University xshen5@ncsu.edu	Dr. Frank Mueller Professor North Carolina State University mueller@cs.ncsu.edu
Dr. Madan Musuvathi Principal Researcher Microsoft Research madanm@microsoft.com	Dr. Saman Amarasinghe Professor Massachusetts Institute of Technology saman@csail.mit.edu