Yufei Ding

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Yufei's homepage

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Employment

2017 – Now	**Assistant Professor** Department of Computer Science Department of Electrical & Computer Engineering (joint appointment) University of California, Santa Barbara, USA.

Education

2014 – 2017	**Ph.D. in Computer Science**, North Carolina State University, USA. Advisor: Dr. Xipeng Shen
2012 – 2014	**Ph.D. Candidate in Computer Science**, College of William and Mary, USA. Transfer to North Carolina State University with my advisor.
2009 – 2011	**M.S. in Physics**, College of William and Mary, USA. Advisor: Dr. Gunter Luepke.
2005 – 2009	**B.S. in Physics**, University of Science and Technology of China, China. Advisor: Dr. Zejun Ding.

Areas of Research

Compiler Optimization, Domain Specific Languages, Machine Learning, Neural Networks, Quantum Computing, Computer Architecture, GPU/FPGA Programming and Optimization.

Previous Professional Appointments

2014 – 2017	**Research Assistant**, Department of Computer Science North Carolina State University, USA
Summer 2015	**Research Intern** Microsoft Research, Redmond.
Summer 2012	**Visiting Research Student** Massachusetts Institute of Technology.
2012 – 2014	**Research Assistant**, Department of Computer Science College of William and Mary.

Publications

[TVLSI'19] Liang Chang, Xin Ma, Zhaohao Wang, Youguang Zhang, **Yufei Ding**, Weisheng Zhao, Yuan Xie, "DASM: Data-streaming based Computing in Non-Volatile Memory Architecture for Embedded System", the IEEE Transactions on Very Large Scale Integration (VLSI) Systems, 2019.

[ICLR'19] Liu Liu, Lei Deng, Xing Hu, Maohua Zhu, Guoqi Li, **Yufei Ding**, Yuan Xie, "Dynamic Sparse Graph for Efficient Deep Learning", the International Conference on Learning Representations (ICLR), 2019.

[ASPLOS'19] Gushu Li, **Yufei Ding**, Yuan Xie, "Tackling the Qubit Mapping Problem for NISQ-Era Quantum Devices", the International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2019.

[NSF Workshop Report'18] Albert Cohen, et. al., "Workshop on Inter-disciplinary Research Challenges in Computer Systems", the Visioning Workshop at ASPLOS, 2018.

[SysML'18] **Yufei Ding**, Xipeng Shen, Lin Ning, Hui Guan, Xipeng Shen, Madanlal Musuvathi, Todd Mytkowicz, "TOP: A Compiler-Based Framework for Optimizing Machine Learning Algorithms through Generalized Triangle Inequality", the Conference on Systems and Machine Learning (SysML), 2018.

[ICDE'18] Hui Guan, **Yufei Ding**, Xipeng Shen, Hamid Krim, "Reuse-Centric K-Means Configuration", the IEEE International Conference on Data Engineering (ICDE), 2018.

[OOPSLA'17] **Yufei Ding**, Xipeng Shen, "GLORE: Generalized Loop Redundancy Elimination upon LER-Notation", the ACM SIGPLAN Conference on Object-oriented Programming, Systems, Languages, and Applications (OOPSLA), 2017.

[PLDI'17] **Yufei Ding**, Ling Ning, Hui Guan, Xipeng Shen, "Generalizations of the Theory and Deployment of Triangular Inequality for Compiler-based Strength Reduction", the ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI), 2017.

[ICDE'17] Guoyang Chen, **Yufei Ding**, Xipeng Shen, "Sweet KNN: An Efficient KNN on GPU through Reconciliation of Redundancy and Regularity", the IEEE International Conference on Data Engineering (ICDE), 2017.

[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 International Conference on Machine Learning (ICML), 2015.

[VLDB'15] **Yufei Ding**, Xipeng Shen, Madan Musuvathi, Todd Mytkowicz, "TOP: A Framework for Enabling Algorithmic Optimizations for Distance-Related Problems", the International Conference on Very Large Data Bases (VLDB), 2015.

[PLDI'15] **Yufei Ding**, Jason Ansel, Kalyan Veeramachaneni, Xipeng Shen, Una-May O'Reilly, Saman Amarasinghe, "Autotuning Algorithmic Choice for Input Sensitivity", the ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI), 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 International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2014.

[OOPSLA'14] Zhijia Zhao, Bo Wu, Mingzhou Zhou, **Yufei Ding**, Jianhua Sun, Xipeng Shen, Youfeng Wu, "Call Sequence Prediction through Probabilistic Calling Automata", the ACM SIGPLAN Conference on Object-oriented Programming, Systems, Languages, and Applications (OOPSLA), 2014.

[CGO'13] Mingzhou Zhou, Bo Wu, **Yufei Ding**, Xipeng Shen, "ProfMig: The First Framework for Migrating Program Profiles Across Software Versions", the International Symposium on Code Generation and Optimization (CGO), 2013.

Work under Submission

[NeurIPS19] Zhizhou Zhang, Yuke Wang, Boyuan Feng, Lei Deng, Yuan Xie, **Yufei Ding**, "Convolutional Neural Network Architecture Optimization via Information Field".

[NeurIPS19] Xiaolei Liu, Kun Wan, **Yufei Ding**, "Towards Weighted-sampling Audio Adversarial Example Attack".

[ASPLOS'20] Gushu Li, **Yufei Ding**, Yuan Xie, "SANQ: A Simulation Framework for Architecting Noisy Intermediate-Scale Quantum Computing System".

[ASPLOS'20] Gushu Li, **Yufei Ding**, Yuan Xie, "Towards Efficient Superconducting Quantum Processor Architecture Design".

[ASPLOS'20] Boyuan Feng, Yuke Wang, Zhizhou Zhang, **Yufei Ding**, "Runtime System Support for Efficient Video Processing towards Dynamic Class Skew".

[ASPLOS'20] Xing Hu, Ling Liang, Lei Deng, Shuangchen Li, Xinfeng Xie, Yu Ji, **Yufei Ding**, Chang Liu, Timothy Sherwood, Yuan Xie, "Neural Network Model Extraction Attacks in Edge by Exploiting Architectural Hints".

[ASPLOS'20] Liu Liu, Zheng Qu, Lei Deng, Shuangchen Li, Xing Hu, Jilan Lin, Zhengyu Gu, **Yufei Ding**, Yuan Xie, "SpaceX: Sparse-Centric Deep Learning Accelerator with General Sparsity Speculation and Balanced Execution".

[ASPLOS'20] Yuke Wang, Georgios Tzimpragos, Boyuan Feng, Zhizhou Zhang, Lei Deng, Yuan Xie, **Yufei Ding**, "AccD: A Framework for Accelerating Distance-related Algorithms on Reconfigurable Hardware".

Professional Service

Program Committee

ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'20)

ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'20)

ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'20)

ACM SIGPLAN Conference on Object-oriented Programming, Systems, Languages, and Applications (OOPSLA'19)

ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'19)

	International Symposium on Code Generation and Optimization (CGO'19)
	ISC High Performance (ISC'19)
	International Symposium on Memory Management (ISMM'19)
	ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'19)
	International Conference on Computer Aided Verification (CAV'19)
	USENIX Annual Technical Conference (USENIX ATC'18).
	Annual IFIP International Conference on Network and Parallel Computing (NPC'18)
	High-Performance Power-Aware Computing (HPPAC'18) at IEEE International Parallel & Distributed Processing Symposium.
Organization Committee	Web Chair for the 25h ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP'20)
	Co-chair for ACM Student Research Competition (SRC) at the 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'19)
	Co-chair for ACM Student Research Competition (SRC) at the 23rd ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'19)
Reviewer	Conference on Neural Information Processing Systems (NeurIPS'19)
	International Conference on Machine Learning (ICML'19)
	Conference on Uncertainty in Artificial Intelligence (UAI'19)
	IEEE Transactions on Parallel and Distributed Systems (TPDS'18)
	IInternational Conference on Parallel Architectures and Compilation Techniques (PACT'17)
	IEEE Transactions on Parallel and Distributed Systems (TPDS'17)
	Journal of Parallel and Distributed Computing (JPDC'17)
	Transactions on Pattern Analysis and Machine Intelligence (TPAMI'17)
Panelist	National Science Foundation, Directorate for Computer & Information Science & Engineering, Core Programs (NSF CISE '2018)

Undergraduate Research

2018	Jason Gros on "Graph Matching via Multiplicative Update Algorithm".
	Shu Yang on "Input-Adaptive Model Compression".
2019	Annan Zhang on "Accelerating clcNet on the OpenCL-FPGA".
	Xingxing Geng on "Accelerating MobileNet on the OpenCL-FPGA".

Graduate Committees

Chair	M.S. program, Andrew Huang (now at Google), CS, UCSB, 2018.
	Ph.D. program, Boyuan Feng, Major Area Exam, CS, UCSB, Exp. 2020.
	Ph.D. program, Yuke Wang, Major Area Exam, CS, UCSB, Exp. 2020.
Co-chair	Ph.D. program, Liu Liu, Qualify Exam, ECE, UCSB, 2019.
	Ph.D. program, Gushu Li, Qualify Exam, ECE, UCSB, Exp. 2020.
Member	Ph.D. program, Michael Zhang, Major Area Exam, CS, UCSB, 2018.
	Ph.D. program, Peng Gu, Qualify Exam, ECE, UCSB, 2018.
	Ph.D. program, Maohua Zhu, Qualify Exam, ECE, UCSB, 2018.

Awards

2018	Intel FPGA Grant
2019	Xilinx FPGA Grant
2018	NVIDIA GPU Grant
2018	NCSU Computer Science Outstanding Dissertation Award
2016	NCSU Computer Science Outstanding Research Award
2015	NSF Travel Grant for PLDI'15
2014	NSF Travel Grant for ASPLOS'14
2005-2009	Outstanding Undergraduate Student Scholarship Awarded Annually

Teaching Experience

Spring 2019	CS 160 Compiler, UCSB, CA
Winter 2019	CS 165B Machine Learning, UCSB, CA
Fall 2018	CS 293S Program Optimization, UCSB, CA
Fall 2016	Guest Lectures on CSC512 Compiler Construction Course, NCSU, NC
Spring 2016	Guest Lectures on CSC766 Code Optimization for Programs Course, NCSU, NC
Fall 2015	Guest Lectures on CSC512 Compiler Construction Course, NCSU, NC
Spring 2015	Guest Lectures on CSC766 Code Optimization for Programs Course, NCSU, NC