

Kunal Agrawal

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St Louis, Missouri 63130, USA
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- Experience**
- Washington University in St Louis**
Associate Professor June 2015 — Present
- National University of Singapore**
Visiting Associate Professor (Sabbatical) Spring 2017
- Washington University in St Louis**
Assistant Professor September 2009 — June 2015
- Education**
- Massachusetts Institute of Technology**
Ph.D., Computer Science and Engineering August 2003—August 2009
Dissertation Topic: Scheduling and Synchronization for Multicore Concurrency Platforms.
- National University of Singapore, Singapore-MIT Alliance**
S.M., Computer Science July 2001—June 2002
- Ramrao Adik Institute of Technology, Mumbai University**
Bachelor of Engineering, Electronics Engineering July 1997—June 2001
- Interests** Parallel Computing, Algorithms and Data Structures, Parallel Scheduling, Real-Time Scheduling, Synchronization Mechanisms, Dynamic Multithreading, Stream Programming, Cache-Efficient Algorithms, Memory Models, Transactional Memory.
- Conference Publications**
- 1. Practically Efficient Scheduler for Minimizing Average Flow Time of Parallel Jobs**
Kunal Agrawal, Angelina Lee, Jing Li, Kefu Lu, and Benjamin Moseley. To appear in the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)* 2019
 - 2. Efficient Race Detection with Futures**
Robert Utterback, Kunal Agrawal, Jeremy Fineman and Angelina Lee. To appear in the *Proceedings of Symposium on Principles and Practices of Parallel Programs (PPoPP)* 2019
 - 3. Reservation-Based Federated Scheduling for Parallel Real-Time Tasks.**
Niklas Ueter, Georg von der Brüggen, Jian-Jia Chen, Jing Li and Kunal Agrawal. In the *Proceedings of the Real Time Systems Symposium (RTSS)* 2018. **Outstanding Paper Award**
 - 4. Elasticity of Workloads and Periods of Parallel Real-Time Tasks.**
James Orr, Chris Gill, Kunal Agrawal, Sanjoy Baruah, Christian Cianfarani, Phyllis Ang, and Christopher Wong. In the *Proceedings of Conference on Real-Time Networks and Systems (RTNS)* 2018
 - 5. A Measurement-based Model for Parallel Real-time Tasks.**
Kunal Agrawal and Sanjoy Baruah. In the *Proceedings of the Euromicro Conference on Real-Time Systems (ECRTS)* 2018
 - 6. Intractability Issues in Mixed-Criticality Scheduling.**
Kunal Agrawal and Sanjoy Baruah. In the *Proceedings of the Euromicro Conference on Real-Time Systems (ECRTS)* 2018

7. **Parallel Working-Set Search Structures.**
Wei Quan Lim, Seth Gilbert and Kunal Agrawal. In the *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)* 2018
8. **The Power to Schedule Parallel Programs**
Kunal Agrawal and Seth Gilbert. In the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)* 2018
9. **Scheduling Parallelizable Jobs Online to Maximize Throughput**
Kufu Lu, Kunal Agrawal, Jing Li and Benjamin Moseley. In the *Proceedings of the Latin American Theoretical Informatics Symposium (LATIN)* 2018.
10. **Efficient Parallel Determinacy Race Detection for Two-Dimensional Dags**
Yifan Xu, Angelina Lee and Kunal Agrawal In the *Proceedings of Symposium on Principles and Practices of Parallel Programs (PPoPP)* 2018.
11. **Race Detection and Reachability in Nearly Series-Parallel DAGs**
Kunal Agrawal, Joseph Devietti, Jeremy Fineman, I-Ting Angelina Lee, Robert Utterback and Changming Xu In the *Proceedings of the Symposium on Discrete Algorithms (SODA)* 2018.
12. **Locality Aware Dynamic Task Graph Scheduling.**
Jordyn Maglalang, Kunal Agrawal and Sriram Krishnamoorthy. In the *Proceedings of International Conference on Parallel Processing (ICPP)* 2017.
13. **Processor-Oblivious Record and Replay**
Robert Utterback, Kunal Agrawal, I-Ting Angelina Lee, and Milind Kulkarni. To appear in the *Proceedings of the ACM/SIGPLAN Symposium on Principles and Practices of Parallel Programming (PPoPP), 2017*
14. **Exploiting Vector and Multicore Parallelism for Recursive Data and Task Parallel Programs**
Bin Ren, Sriram Krishnamoorthy, Kunal Agrawal and Milind Kulkarni. To appear in the *Proceedings of the ACM/SIGPLAN Symposium on Principles and Practices of Parallel Programming (PPoPP), 2017*
15. **Randomized Work Stealing for Large-Scale Soft Real-Time Systems**
Jing Li, Son Dinh, Kevin Keiselbach, Kunal Agrawal, Christopher Gill and Chenyang Lu. In the *Proceedings of the IEEE Real Time Systems Symposium (RTSS) 2016*
16. **Provably good and practically efficient parallel race detection for fork-join programs**
Robert Utterback, Kunal Agrawal, Jeremy Fineman and Angelina Lee. In the *Proceedings of the ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2016*
17. **Scheduling Parallelizable Jobs Online to Minimize Maximum Flow Time**
Kunal Agrawal, Jing Li, Kefu Lu and Benjamin Moseley. In the *Proceedings of the ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), 2016*
18. **Mixed-Criticality Federated Scheduling for Parallel Real-Time Tasks**
Jing Li, David Ferry, Shaurya Ahuja, Kunal Agrawal, Christopher Gill, and Chenyang Lu. In the *Proceedings of the IEEE Real-Time Embedded Technology and Applications Symposium (RTAS), 2016 Outstanding Paper*
19. **Work Stealing for Interactive Services to Meet Target Latency.**
Jing Li, Kunal Agrawal, Kunal Agrawal, Sameh Elnikety, Yuxiong He, I-Ting Angelina Lee, Chenyang Lu and Kathryn S. McKinley. In the *Proceedings of the ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming (PPoPP), 2016*

20. **Scheduling Parallel DAG Jobs Online to Minimize Average Flow Time**
Kunal Agrawal, Jing Li, Kefu Lu and Benjamin Moseley. In the *Proceedings of ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2016
21. **Efficient Execution of Recursive Programs on Commodity Vector Hardware**
Bin Ren, Youngjoon Jo, Sriram Krishnamoorthy, Kunal Agrawal, and Milind Kulkarni. In *Proceedings of ACM-SIGPLAN Symposium on Programming Languages Design and Implementation (PLDI)*, 2015
22. **Elastic Tasks: Unifying Task Parallelism and SPMD Parallelism with an Adaptive Runtime**
Aline Sbirlea, Kunal Agrawal, and Vivek Sarker. In the *Proceedings of International European Conference on Parallel and Distributed Computing (EuroPar)*, 2015
23. **Cache-Conscious Scheduling of Streaming Pipelines on Parallel Machines with Private Caches**
Kunal Agrawal, Jeremy Fineman and Jordyn Maglalang. In the *Proceedings of the IEEE International Conference on High Performance Computing (HiPC)*, 2014. Acceptance Rate: 23%.
24. **Real-Time System Support for Hybrid Structural Simulation**
David Ferry, Kunal Agrawal, Chenyang Lu, Chris Gill, Gregory Bunting, Amin Megareh, Shirley Dyke and Arun Prakash. In the *Proceedings of the ACM International Conference on Embedded Software (EMSOFT)*, 2014
25. **Fault-Tolerant Dynamic Task Graph Scheduling**
Mehmet Can Kurt, Sriram Krishnamoorthy, Kunal Agrawal and Gagan Agrawal. In the *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC)*, 2014. Acceptance Rate: 20%. **Best Student Paper Award Nominee.**
26. **Federated Scheduling for Stochastic Parallel Real-time Tasks**
Jing Li, Kunal Agrawal, Christopher Gill, and Chenyang Lu. In the *Proceedings of the IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA)*, 2014. Acceptance Rate: 30%.
27. **On the performance of a highly parallelizable concurrency platform for real-time hybrid simulation**
David Ferry, Amin Megareh, Gregory Bunting, Arun Prakash, Kunal Agrawal, Chris Gill, Chenyang Lu and Shirley Dyke. In the *Proceedings of the World Conference on Structural Control and Monitoring (6WCSCM)*, 2014.
28. **Analysis of Federated and Global Scheduling for Real-Time Parallel Tasks**
Jing Li, Jian-Jia Chen, Kunal Agrawal, Chenyang Lu, Chris Gill and Abusayeed Saifullah. In the *Proceedings of the Euromicro Conference on Real-Time Systems (ECRTS)*, 2014.
29. **Provably Good Scheduling for Parallel Programs that Use Data Structures through Implicit Batching**
Kunal Agrawal, Jeremy Fineman, Kefu Lu, Brendan Sheridan, Jim Sukha and Robert Utterback. In the *Proceedings of the ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)*, 2014. Acceptance Rate: 24%.
30. **Analysis of Classic Algorithms on GPUs**
Lin Ma, Kunal Agrawal and Roger Chamberlain. In the *Proceedings of the IEEE/ACM International Conference on High Performance Computing and Simulation (HPCS)*, 2014. **Best Paper Award Runner-Up.**

31. **Performance Modeling on Highly-threaded Many-core GPUs**
Lin Ma, Roger Chamberlain and Kunal Agrawal. In the *IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP)*, 2014. Acceptance Rate: 26%.
32. **Stochastic Neighbor Compression**
Matthew Kusner, Stephen Tyree, Kilian Q. Weinberger and Kunal Agrawal. In the *International Conference on Machine Learning (ICML)*, 2014. Acceptance Rate: 25%.
33. **Adding Data Parallelism to Streaming Pipelines for Throughput Optimization**
Peng Li, Kunal Agrawal, Jeremy Buhler, Roger D. Chamberlain. In the *Proceedings of the High Performance Computing Conference (HiPC)*, 2013. Acceptance Rate: 25%.
34. **Analysis of Global EDF for Parallel Tasks**
Jing Li, Kunal Agrawal, Chenyang Lu, Christopher Gill. In the *Proceedings of the Euromicro Conference on Real Time Systems (ECRTS)*, 2013. Acceptance Rate: 27%. **Outstanding Paper Award.**
35. **A Real-Time Scheduling Service for Parallel Tasks**
David Ferry, Jing Li, Mahesh Mahadevan, Kunal Agrawal, Christopher Gill, and Chenyang Lu. In the *Proceedings of the Real-Time and Embedded Technology and Applications Symposium (RTAS)*, 2013. Acceptance Rate: 28%.
36. **A Memory Access Model for Highly-threaded Many-core Architectures**
Lin Ma, Kunal Agrawal and Roger Chamberlain. To appear in the *Proceedings of the IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, 2012. Acceptance Rate: 29%.
37. **Cache-Conscious Scheduling of Streaming Applications**
Kunal Agrawal, Jeremy T. Fineman, Jordan Krage, Charles E. Leiserson, and Sivan Toledo. In the *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)* 2012. Acceptance rate: 30%.
38. **Efficient Deadlock Avoidance for Streaming Computations with Filtering**
Jeremy Buhler, Kunal Agrawal, Peng Li, and Roger Chamberlain. In the *Proceedings of the Symposium on Principles and Practices of Parallel Programming (PPoPP)* 2012, pp 235–246. Acceptance rate: 15%.
39. **Multi-core Real-Time Scheduling for Generalized Parallel Task Models**
Abusayeed Saifullah, Kunal Agrawal, Chenyang Lu, and Christopher Gill. In the *Proceedings of the Real Time Systems Symposium (RTSS)* 2011, pp 217 – 226. Acceptance rate: 12%. **Best Student Paper Award.**
40. **Parallel Boosted Regression Trees for Web Search Ranking**
Stephen Tyree, Kilian Q. Weinberger, Kunal Agrawal, and Jennifer Paykin. In the *Proceedings of the international conference on World Wide Web (WWW)*, 2011, pp 387–396. Acceptance Rate: 12%.
41. **Deadlock-avoidance for Streaming Applications with Split-Join Structure: Two Case Studies.**
Peng Li, Kunal Agrawal, Jeremy Buhler, Roger D. Chamberlain, and Joseph M. Lancaster. In the *Proceedings of IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP)*, 2010, pp 333–336.
42. **Deadlock Avoidance for Streaming Computations with Filtering**
Peng Li, Kunal Agrawal, Jeremy Buhler and Roger Chamberlain. In the *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)* 2010, pp 243–252. Acceptance rate: 28%.

43. **Executing Task Graphs with Work-Stealing**
Kunal Agrawal, Charles E. Leiserson and Jim Sukha. In the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)* 2010, pp 1–12. Acceptance rate: 23%.
44. **Scheduling Algorithms for Linear Workflow Optimization**
Kunal Agrawal, Anne Benoit, Loic Magnan and Yves Robert. In the *Proceedings of the International Parallel and Distributed Processing Symposium (IPDPS)* 2010, pp 1–12. Acceptance rate: 23%.
45. **Helper Locks for Fork-Join Parallel Programming**
Kunal Agrawal, Charles E. Leiserson and Jim Sukha. In the *Proceedings of the ACM/SIGPLAN Symposium on the Principles and Practices of Parallel Programming (PPOPP)* 2010, pp 245–256. Acceptance rate: 17%.
46. **Mapping Filtering Streaming Applications With Communication Costs**
Kunal Agrawal, Anne Benoit, Fanny Dufossé and Yves Robert. In the *Proceedings of the Symposium on Parallel Algorithms and Architectures (SPAA)* 2009, pp 19–28. Acceptance rate: 31%.
47. **Safe Open-Nested Transactions Using Ownership**
Kunal Agrawal, Angelina Lee and Jim Sukha. In the *Proceedings of the ACM/SIGPLAN Symposium on the Principles and Practices of Parallel Programming (PPOPP)* 2009, pp 151–162. Acceptance rate: 24%.
48. **Mapping Linear Workflows with Computation/Communication Overlap**
Kunal Agrawal, Anne Benoit and Yves Robert. In the *Proceedings of the International Conference on Parallel and Distributed Systems (ICPADS)* 2008, pp 195–202. Acceptance rate: 38%.
49. **Nested Parallelism in Transactional Memory.**
Kunal Agrawal, Jeremy Fineman, and Jim Sukha. In the *Proceedings of the ACM/SIGPLAN Symposium on the Principles and Practices of Parallel Programming (PPOPP)* 2008, pp 163–174. Acceptance rate: 24%.
50. **Worst Page-Replacement Strategy.**
Kunal Agrawal, Michael Bender and Jeremy Fineman. In the *Proceedings of the International Conference on Fun with Algorithms (FUN)* 2007, pp 135–145.
51. **Work Stealing with Parallelism Feedback.**
Kunal Agrawal, Yuxiong He, and Charles E. Leiserson. In the *Proceedings of the ACM/SIGPLAN Symposium on the Principles and Practices of Parallel Programming (PPOPP)* 2007. Acceptance rate: 24%.
52. **Memory Models for Open-Nested Transactions.**
Kunal Agrawal, Charles E. Leiserson, and Jim Sukha. In the *Proceedings of the ACM/SIGPLAN Workshop on Memory Systems Performance and Correctness (MSPC)* 2006, pp 70–81.
46. **An Empirical Evaluation of Work Stealing with Parallelism Feedback.**
Kunal Agrawal, Yuxiong He, and Charles E. Leiserson. In the *Proceedings of the International Conference on Distributed Computing Systems (ICDCS)* 2006, pp 19–28. Acceptance rate: 14%.
53. **Adaptive Task Scheduling with Parallelism Feedback.**
Kunal Agrawal, Yuxiong He, Wen Jing Hsu, and Charles E. Leiserson. In the *Proceedings of ACM/SIGPLAN Symposium on the Principles and Practices of Parallel Programming (PPOPP)* 2006, pp 100–109. Acceptance rate: 27%.

**Journal
Publications**

1. **Blocking Analysis for Spin Locks in Real-Time Parallel Tasks.**
Son Dinh, Jing Li, Kunal Agrawal, Chris Gill and Chenyang Lu. *IEEE Transactions on Parallel and Distributed Systems*. 29(4): 789-802, April 2018.
2. **Mixed Criticality Federated Scheduling for Real-Time Parallel Tasks.**
Jing Li, Shaurya Ahuja, David Ferry, Kunal Agrawal, Chris Gill and Chenyang Lu. *Real Time Systems Journal. Special Issue on Mixed-Criticality, Multicore and Microkernels*. May 2017.
3. **Analysis of Classic Algorithms on Highly-Threaded Many-Core Architectures.**
Lin Ma, Roger Chamberlain, Kunal Agrawal, Chen Tian, and Ziang Hu. *Future Generations of Computing Systems*. February 2017.
4. **Global EDF Scheduling for Parallel Real-Time Tasks**
Jing Li, Zheng Luo, David Ferry, Kunal Agrawal, Chenyang Lu and Chris Gill. *Real Time Systems Journal* 2015
5. **Parallel Real-Time Scheduling of DAGs**
Abusayeed Saifullah, David Ferry, Kunal Agrawal, Chenyang Lu and Christopher Gill. *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, 99:pp1-30, 2014.
6. **A memory access model for highly-threaded many-core architectures**
Lin Ma, Kunal Agrawal and Roger D. Chamberlain. *Future Generation Computer Systems (FCGS)* pp202-215, 2013.
7. **Multi-core Real-Time Scheduling for Generalized Parallel Task Models**
Abusayeed Saifullah, Jing Li, Kunal Agrawal, Chris Gill and Chenyang Lu. *Real Time Systems Journal (RTSJ)* 49(4): 404-435. 2013.
8. **Mapping Filtering Streaming Applications With Communication Costs**
Kunal Agrawal, Anne Benoit, Fanny Dufossé and Yves Robert. *Algorithmica, Springer*. 62(2): 258–308. 2012.
9. **Adaptive Work Stealing with Parallelism Feedback**
Kunal Agrawal, Yuxiong He, Wen Jung Hsu, and Charles Leiserson. *ACM Transactions on Computer Systems (TOCS)* 26(3):7. 2008.
10. **The Worst Page Replacement Strategy**
Kunal Agrawal, Michael Bender and Jeremy Fineman. *Theory of Computer Systems* 44(2):175–185. 2008.

**Short
Publications**

1. **Cache-Oblivious Scheduling of Streaming Pipelines**
Kunal Agrawal and Jeremy Fineman. In the *Proceedings of ACM Symposium on Parallelism in Algorithms and Architectures (SPAA)* 2014.
Brief Announcement.
2. **Theoretical Analysis of Classic Algorithms on Highly-threaded Many-core GPUs**
Lin Ma, Kunal Agrawal and Roger D. Chamberlain. In the *Proceedings of ACM SIGPLAN Symposium on Principles and Practices of Parallel Processing (PPoPP) 2014*
Poster.
3. **Provably Good Scheduling of Parallel Programs that Use Data Structures**
Kunal Agrawal, Jeremy Fineman, Brendan Sheridan, Jim Sukha, and Robert Utterback In the *Proceedings of ACM SIGPLAN Symposium on Principles and Practices of Parallel Processing (PPoPP) 2014*
Poster.

4. **Serial-Parallel Reciprocity in Dynamic Multithreaded Languages**

Kunal Agrawal, I-Ting Angelina Lee, and Jim Sukha. *ACM Symposium on Parallelism in Algorithms and Architectures 2010*

Brief Announcement.

Invited Talks

Parallel Programming: Teaching Sound Principles and Good Practices

Keynote Talk at Workshop on Education in HPC

November 2017

Concurrency Platforms for Parallel Programs

National University of Singapore, Singapore February 2017

Nanyang Technological University, Singapore May 2017

Provably Good Scheduling for Parallel Computations

Scuola Superiore Sant'Anna, Pisa, Italy. April, 2014

University of Texas at Austin. February, 2014

Rice University. February, 2014

Brown University. November, 2013

University of Chicago. October, 2012

Cache-Conscious Scheduling of Streaming Computations

Seminar on New Challenges in Scheduling Theory, Aussois, France. April, 2014

Stealing is Good — If It's Work

MIT — Seminar in honor of Charles Leiserson's 60th Birthday. November, 2013

Scheduling Streaming Computations

Seminar on Scheduling for Large-Scale Systems, University of Pittsburgh. June, 2012

Helper Locks for Fork-Join Programs

Stony Brook University. May 2010

IBM Research. December 2009

(Provably-Good) Scheduling and Synchronization for Multicores

IBM. March 2009

Adaptive Scheduling with Parallelism Feedback

IBM Research. November 2008

Seminar on Scheduling for Large Scale Systems, Aussois, France. May 2008

Microsoft Research. August 2007

Provably-Good Adaptive Scheduling with Parallelism Feedback

Stanford University. October, 2006

Patent

Computing the Processor Desires of Jobs in an Adaptively Parallel Scheduling Environment

Co-authored with Charles E. Leiserson, Yuzhong He, and Wen Jing Hsu US8510741 B2

Courses Taught

CSE 241: Algorithms and Data Structures

Fall 2013: 112 Undergraduate Students, 23 Graduate Students.

Fall 2012 (Co-Taught with Weixiong Zhang): 74 Undergraduate Students, 11 Graduate Students.

Spring 2012: 59 Undergraduate Students, 7 Graduate Students.

Spring 2011: 33 Undergraduate Students, 3 Graduate Students.

Fall 2009: 45 Undergraduate Students, 7 Graduate Students.

CSE 341: Parallel and Sequential Algorithms

Course developed with the help of Intel Gift.

Fall 2017: 27 Undergraduate Students

Fall 2016: 13 Undergraduate Students

Fall 2015: 20 Undergraduate Students

Spring 2013: 24 Undergraduate Students.

Fall 2014: 12 Undergraduate Students
Fall 2015: 18 Undergraduate Students
Fall 2016: 13 Undergraduate Students

CSE 347T: Analysis of Algorithms

Fall 2018: 50 Undergraduate Students

CSE 549T: Theory of Parallel Systems

New course developed

Spring 2019: Spring 2018: 20 Undergraduate Students, 7 Graduate Students

Spring 2016: 12 Undergraduate Students, 5 Graduate Students

Spring 2015: 9 Undergraduate Students, 7 Graduate Students

Fall 2011: 4 Undergraduate Students, 8 Graduate Students

Fall 2014: 7 Graduate Students, 4 undergraduate students

Spring 2016: 7 Graduate Students, 8 Undergraduate Students

CSE 569M: Parallel Architectures and Algorithms

Spring 2010: 3 Undergraduate Students, 9 Graduate Students.

Funding

SPX: Collaborative research: Eat your Wheaties: Multi-grain compilers for builds at every scale

Principle Investigator (co-PIs: Milind Kulkarni (Purdue University) Ryan Newton, and Sam Tobin-Hochstadt (Indiana University))

National Science Foundation Research Grant

\$200,000 (for Washington University); \$800,000 (Total)

08/2017-07/2021

AiTF: Applied algorithmic foundation for scheduling multiprogrammed parallelizable workloads

co-Principle Investigator (PI: Ben Moseley; co-PI: Angelina Lee) \$600,000

10/2017-09/2021

SHF: Small: Locality-aware concurrency platforms

co-Principle Investigator (PI: Angelina Lee)

National Science Foundation Research Grant

\$299,695

06/2015-05/2018

XPS: FULL: FP: Collaborative Research: Taming parallelism: Optimally Exploiting High-throughput Parallel Architectures

Principle Investigator (co-PI: Milind Kulkarni (Purdue University))

National Science Foundation Research grant

\$330,250 for Washington University; Total: \$660,000.

09/2014-08/2018

XPS: Scheduling and Synchronization for Real-Time Tasks

Principle Investigator (co-PIs: Chris Gill and Chenyang Lu)

National Science Foundation Research Grant

\$749,950

08/2013-08/2017

Unrestricted Gift from Intel Corporation

Principle Investigator

Goal: Development of undergraduate course on parallel algorithms

\$50,000

AF: Small: Collaborative Research: Data Structures for Parallel Algorithms

Principle Investigator (co-PIs: Michael Bender (Stony Brook) and Jeremy Fineman (Georgetown))
National Science Foundation Research Grant
\$171,947 for Washington University; \$450,000 total.
07/2012-06/2015

CAREER: Provably Good Concurrency Platforms for Streaming Applications

Principle Investigator
National Science Foundation *CAREER* Award
\$422,952
06/2012-06/2017

CPS: Medium: Collaborative Research: CyberMech, a Novel Run-Time Substrate for Cyber-Mechanical Systems

co-Principle Investigator (PI: Chris Gill, co-PI: Chenyang Lu)
National Science Foundation Research Grant
\$899,987 for Washington University; \$1,800,000 total
09/2011-09/2015

**Ph. D
Students**

Lin Ma — Co-advised with Roger Chamberlain
Thesis Title: Modeling Algorithm Performance on Highly Threaded Many Core Machines
Graduation: Fall 2014 (Defended in October 2014)

Peng Li — Co-advised with Roger Jeremy Buhler and Roger Chamberlain
Thesis Title: The Synchronized Filtering Dataflow
Graduation: Fall 2014 (Defended in October 2014)

Stephen Tyree — Co-advised with Kilian Weinberger
Thesis Title: Approximate Algorithms for Fast Machine Learning
Graduation: Fall 2014 (Defended in November 2014)

Jing Li — Co-advised with Chenyang Lu
Thesis Title: Scheduling Parallel Jobs with Deadlines
Graduation: Summer 2017 **Turner Dissertation Award for the best dissertation in the department.**

Robert Utterback
Thesis Title: Easier Parallel Programming with Provably-Efficient Runtime Schedulers
Graduation: Summer 2017

Jordyn Maglalang
Thesis Title: Locality-Conscious Concurrency Platforms
Graduation: Fall 2017

David Ferry — Co-advised with Chris Gill
Thesis Title: Concurrency Platforms for Real-Time and Cyber-Physical Systems
Graduation: Summer 2018

Son Dinh
Thesis Title: Towards Improved Utilization and Resource Sharing in Federated Scheduling for Parallel Real-Time Tasks
Expected Graduation: Fall 2019

**Ph.D Thesis
Committees**

Abusayeed Saifullah, *Real-Time Wireless Sensor-Actuator Networks for Cyber-Physical Systems*
Washington University, 2013

Martin Wimmer, *Variations on Task Scheduling for Shared Memory Systems*
Vienne Technological University, 2014

Sisu Xi, *Real-Time Virtualization and Cloud Computing*

Washington University, 2014

Chengjie Wu, *Real-Time and Energy-Efficient Routing for Industrial Wireless Sensor-Actuator Networks*

Washington University, 2014

Justin Wilson, *A Model and Platform for Designing and Implementing Reactive Systems*

Washington University

Joe Wingbermuehle, *Application-Specific Memory Subsystems*

Washington University

Pramod Ganapathi, *Automatic Discovery of Efficient Divide-and-Conquer Algorithms for Dynamic Programming Problems*

Stony Brook University

James Orr, Washington University in St. Louis.

Chao Wang, Washington University in St. Louis.

Kefu Lu, Washington University in St. Louis.

Awards

Advances in Scheduling for Streaming Concurrency Platforms

NSF Faculty Early Career Development Award (CAREER)

2011

Reservation-Based Federated Scheduling for Parallel Real-Time Tasks.

Outstanding Paper Award (RTSS)

2018

with Niklas Ueter, Georg von der Brüggen, Jian-Jia Chen and Jing Li.

Mixed-Criticality Federated Scheduling for Parallel Real-Time Tasks

Outstanding Paper Award (RTAS)

2016

with Jing Li, Shaurya Ahuja, David Ferry, Chenyang Lu, and Christopher Gill.

Analysis of Classic Algorithms on GPUs

Best Paper Award Runner Up (HPCS)

2014

with Lin Ma and Roger Chamberlain.

Fault-Tolerant Dynamic Task Graph Scheduling

Best Student Paper Award Nominee (SC)

2014

with Mehmet Can Kurt, Sriram Krishnamoorthy, and Gagan Agarwal.

Analysis of Global EDF for Parallel Tasks

Outstanding Paper Award (ECRTS)

2013

with Jing Li, Chenyang Lu, and Christopher Gill.

Multi-core Real-Time Scheduling for Generalized Parallel Task Models

Best Student Paper Award (RTSS)

2011

with Abusayeed Saifullah, Chenyang Lu, and Christopher Gill.

Professional Service

Advisory Board. ACM Transactions on Parallel Computing.

Program Committee Chair.

Symposium on Parallelism in Algorithms and Architectures (SPAA), 2015 Workshop on Mixed Criticality (WMC), 2017 (co-chair)

Program Vice Chair.

European Conference on Parallelism, Algorithms Track, 2011.

Program Committee Member.

Workshop on Models and Algorithms for Planning and Scheduling Problems (MAPSP) Real Time and Embedded Technology and Applications Symposium, 2018.

European Symposium on Algorithms, 2017

International Parallel and Distributed Processing Symposium, 2014, 2013, 2012, 2010.

Symposium on Principles and Practices of Parallel Processing, 2018, 2016, 2013, 2012

Supercomputing, 2013.

Real Time Systems Symposium, 2013, 2012
The International Conference on Advanced Information, 2012
International Conference on Parallel Architecture and Compilation Techniques, 2011
International Conference on Distributed Computing Systems, 2011
Symposium on Parallelism in Algorithms and Architectures, 2010

Reviewer.

Conferences: SODA, ESA, RTSS, SPAA, EuroPAR, HiPC, IPDPS, AINA, PPOPP, ICDCS
Journals: Parallel Computing, Journal of Discrete Algorithms, Algorithmica, Transactions on Parallel and Distributed Systems, Real-Time Systems Journal

University Service.

Chair Search Committee for ESE, 2017
Olin Fellowship Committee, 2016.
Board Member of Association of Women Faculty from 2018

Department Service.

Faculty Search Committee, 2013, 2016, 2019.
Strategic Planning Committee, 2011.

Other.

TCCP Diversity Committee
CDER Algorithms Curriculum Committee group meeting