

# Benjamin J. Moseley, Carnegie Bosch Assistant Professor of Operations Research

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CONTACT INFORMATION	Carnegie Mellon University 5000 Forbes Avenue Pittsburgh, PA 15213	<a href="http://www.andrew.cmu.edu/user/moseleyb/">http://www.andrew.cmu.edu/user/moseleyb/</a> moseleyb@andrew.cmu.edu
RESEARCH INTERESTS	Algorithms, operations research, machine learning, optimization, parallel and distributed computing, scheduling, and large data analysis	
EDUCATION	<b>University of Illinois: Urbana-Champaign:</b> 2012 • Thesis: Online Scheduling Algorithms for Broadcasting and General Cost Functions • Advisor: Chandra Chekuri	Ph.D. in Computer Science
	<b>University of Illinois: Urbana-Champaign:</b> 2007-2008 • Thesis: Online Scheduling to Minimize the Maximum Delay Factor • Advisor: Chandra Chekuri	Master of Science in Computer Science
	<b>University of Illinois: Urbana-Champaign:</b> 2003-2006	Bachelor of Science in Computer Science
HONOURS AND AWARDS	<b>NSF CAREER Award 2018</b> <b>Infor Faculty Award 2018</b> <b>NeurIPS Spotlight Presentation 2018</b> (top 3.5% of submissions) <b>Carnegie Bosch Junior Faculty Chair</b> <b>NIPS Oral Presentation 2017</b> (top 1.3% of submissions) <b>Simons-Berkeley Fellow 2016</b> <b>Yahoo! Academic Career Enhancement (ACE) Award 2015</b> <b>Google Faculty Research Award 2015</b> <b>Best Paper Award IPDPS 2015</b> <b>Best Paper Award SPAA 2013</b> Feng Chen Memorial Award 2011 KDD Oral Presentation 2011 (top 8% of submissions) <b>Best Student Paper Award SODA 2010</b> Outstanding Teaching Award Spring 2008 List of Teachers Ranked as Excellent Spring 2008	
ACADEMIC FACULTY POSITIONS	<b>Carnegie Mellon University</b> , Pittsburgh, PA <i>Carnegie Bosch Assistant Professor of Operations Research</i> <i>Assistant Professor of Operations Research</i> <i>Assistant Professor of Machine Learning</i> (by courtesy)	<b>September 2018– Current</b> <b>January 2018– August 2018</b> <b>January 2018– Current</b>
	<b>Washington University in St. Louis</b> , St. Louis, MO <i>Assistant Professor of Computer Science and Engineering</i>	<b>July 2014– December 2017</b>
	<b>Toyota Technological Institute at Chicago</b> , Chicago, IL <i>Research Assistant Professor</i>	<b>September 2012– July 2014</b>
CONSULTING AND VISITING POSITIONS	<b>Relational AI</b> , Berkeley, CA <i>Consulting Senior Scientist</i>	<b>July 2018– Current</b>
	<b>Simons-Berkeley</b> , Berkeley, CA <i>Fellow for the program on Algorithms and Uncertainty</i>	<b>Fall 2016</b>
	<b>Yahoo! Research</b> , New York, NY <i>Visiting Senior Research Scientist</i>	<b>May 2016 – June 2016</b>

Host: Maxim Sviridenko

**Sandia National Laboratories**, Albuquerque, NM  
*Faculty Summer Sabbatical*  
Host: Cindy Phillips

**June 2013 – August 2013**

**Yahoo! Labs**, Santa Clara, CA  
*Research Scientist Intern*  
Host: Ravi Kumar

**May 2010 – August 2010 and May 2011 – August 2011**

**Great Lakes IT inc**, Chicago, IL  
*Senior Programmer*

**December 2004 – August 2012**

CONFERENCE PAPERS

1. Kunal Agrawal, I-Ting Angelina Lee, Jing Li, Kefu Lu and Benjamin Moseley  
Practically Efficient Scheduler for Minimizing Average Flow Time of Parallel Jobs  
*In Proceedings of the 33rd IEEE International Parallel and Distributed Processing Symposium (IPDPS 2019)*.
2. Shali Jiang, Gustavo Malkomes, Matthew Abbott, Benjamin Moseley and Roman Garnett  
Efficient Nonmyopic Batch Active Search  
*In Advances in Neural Information Processing Systems, 2018 (NeurIPS 2018)*.  
**Spotlight Presentation** (top 168 out of 4856 submissions)
3. Giorgio Lucarelli, Benjamin Moseley, Nguyen Kim Thang, Abhinav Srivastav and Denis Trystram  
Online Non-Preemptive Scheduling to Minimize Weighted Flow-time on Unrelated Machines  
*In Proceedings of the 26th Annual European Symposium on Algorithms (ESA 2018)*.
4. Giorgio Lucarelli, Benjamin Moseley, Nguyen Kim Thang, Abhinav Srivastav and Denis Trystram  
Online Non-preemptive Scheduling on Unrelated Machines with Rejections  
*In Proceedings of the 30th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2018)*.
5. Kunal Agrawal, Jing Li, Kefu Lu and Benjamin Moseley  
Scheduling Parallelizable Jobs Online to Maximize Throughput  
*In Proceedings of the 15th Latin American Theoretical Informatics Symposium (LATIN 2018)*.
6. Benjamin Moseley and Joshua Wang  
Approximation Bounds for Hierarchical Clustering: Average-Linkage, Bisecting K-means, and Local Search  
*In Advances in Neural Information Processing Systems, 2017 (NIPS 2017)*.  
**Oral Presentation** (top 40 out of 3240 submissions)
7. Sungjin Im, Benjamin Moseley, Kirk Pruhs and Clifford Stein  
An  $O(\log \log m)$ -competitive Algorithm for Online Machine Minimization  
*In Proceedings of the Real-Time Systems Symposium, 2017 (RTSS 2017)*.
8. Sungjin Im, Benjamin Moseley, Kirk Pruhs and Clifford Stein  
Minimizing Maximum Flow Time on Related Machines via Dynamic Posted Pricing  
*In Proceedings of the 25th Annual European Symposium on Algorithms (ESA 2017)*.
9. Shali Jiang, Gustavo Malkomes, Geoff Converse, Alyssa Shofner, Benjamin Moseley, Roman Garnett  
Efficient Nonmyopic Active Search  
*In Proceedings of the 34th International Conference on Machine Learning (ICML 2017)*.
10. Kunal Agrawal, Jing Li, Kefu Lu and Benjamin Moseley  
Scheduling Parallelizable Jobs Online to Maximize Throughput  
*In Proceedings of the 29th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2017)*. *Brief Announcement*.
11. Sungjin Im, Benjamin Moseley, and Xiaorui Sun  
Efficient Massively Parallel Methods for Dynamic Programming  
*In Proceedings of the Symposium on Theory of Computing (STOC 2017)*

12. Shalmoli Gupta, Ravi Kumar, Kefu Lu, Benjamin Moseley, and Sergei Vassilvitskii  
Local Search Methods for k-Means with Outliers  
*In Proceedings of the International Conference on Very Large Data Bases (VLDB 2017)*
13. Gustavo Malkomes, Kefu Lu, Blakeley Hoffman, Roman Garnett, Benjamin Moseley and Richard Mann  
Cooperative Set Function Optimization Without Communication or Coordination  
*In Proceedings of the International Conference on Autonomous Agents and Multiagent Systems (AA-MAS 2017)*
14. Varun Gupta, Benjamin Moseley, Marc Uetz and Qiaomin Xie  
Stochastic Online Scheduling on Unrelated Machines  
*In Proceedings of the 19th Conference on Integer Programming and Combinatorial Optimization (IPCO 2017).*
15. Sungjin Im, Benjamin Moseley and Shi Li  
Breaking  $1 - 1/e$  Barrier for Non-preemptive Throughput Maximization  
*In Proceedings of the 19th Conference on Integer Programming and Combinatorial Optimization (IPCO 2017).*
16. Sungjin Im, and Benjamin Moseley  
Fair Scheduling via Iterative Quasi-Uniform Sampling  
*In Proceedings of the 28th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2017).*
17. Sungjin Im, Janardhan Kulkarni, Benjamin Moseley and Kamesh Munagala  
A Competitive Flow Time Algorithm for Heterogeneous Clusters under Polytope Constraints  
*In Proceedings of the 19th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2016).*
18. Sungjin Im and Benjamin Moseley  
General Profit Scheduling and the Power of Migration on Heterogeneous Machines  
*In Proceedings of the 28th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2016).*
19. Kunal Agrawal, Jing Li, Kefu Lu and Benjamin Moseley  
Scheduling Parallelizable Jobs Online to Minimize Maximum Flow Time  
*In Proceedings of the 28th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2016).*
20. Shaurya Ahuja, Kefu Lu, and Benjamin Moseley  
Partitioned Feasibility Tests for Sporadic Tasks on Heterogeneous Machines  
*In Proceedings of the 30th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2016).*
21. Kunal Agrawal, Jing Li, Kefu Lu, and Benjamin Moseley  
Scheduling Parallel DAG Jobs Online to Minimize Average Flow Time  
*In Proceedings of the 27th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2016).*
22. Gustavo Malkomes, Matt Kusner, Wenlin Chen, Kilian Weinberger and Benjamin Moseley  
Fast Distributed k-Center Clustering with Outliers on Massive Data  
*In Proceedings of the 29th Conference on Neural Information Processing Systems (NIPS 2015)*
23. Roozbeh Ebrahimi, Samuel McCauley and Benjamin Moseley  
Scheduling Parallel Jobs Online with Convex and Concave Parallelizability  
*In Proceedings of the 13th Workshop on Approximation and Online Algorithms (WAOA 2015)*
24. Michael A. Bender, Jonathan Berry, Simon D. Hammond, Branden Moore, Benjamin Moseley and Cynthia A. Phillips  
k-Means Clustering on Two-Level Memory Systems  
*In The International Symposium on Memory Systems (MEMSYS 2015).*
25. Sungjin Im and Benjamin Moseley  
Weighted Reordering Buffer Improved via Variants of Knapsack Covering Inequalities  
*In The 42nd International Colloquium on Automata, Languages, and Programming (ICALP 2015).*

26. Noa Avigdor-Elgrabli, Sungjin Im, Benjamin Moseley and Yuval Rabani  
On the Randomized Competitive Ratio of Reordering Buffer Management with Non-Uniform Costs  
*In The 42nd International Colloquium on Automata, Languages, and Programming (ICALP 2015).*
27. Sungjin Im, Janardhan Kulkarni and Benjamin Moseley  
Temporal Fairness of Round Robin: Competitive Analysis for Lk-norms of Flow Time  
*In Proceedings of the 27th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2015).*
28. Sungjin Im and Benjamin Moseley  
Scheduling in Bandwidth Constrained Tree Networks  
*In Proceedings of the 27th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2015).*
29. Sungjin Im and Benjamin Moseley  
Fast and Better Distributed MapReduce Algorithms for k-Center Clustering  
*In Proceedings of the 27th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2015). Brief Announcement.*
30. Michael A. Bender, Jonathan W Berry, Simon Hammond, Karl Hemmert, Samuel McCauley, Branden Moore, Benjamin Moseley, Cynthia A Phillips, David Resnick, and Arun Rodrigues  
Two-Level Main Memory Co-Design: Multi-Threaded Algorithmic Primitives, Analysis, and Simulation  
*In Proceedings of the 29th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2015).*

**Awarded Best Paper**

31. Sungjin Im, Benjamin Moseley and Kirk Pruhs  
Stochastic Scheduling of Heavy-tailed Jobs  
*In Proceedings of the 32nd Symposium on Theoretical Aspects of Computer Science (STACS 2015).*
32. Sungjin Im, Shi Li, Benjamin Moseley, and Eric Torng  
A Dynamic Programming Framework for Non-Preemptive Scheduling Problems on Multiple Machines  
*In Proceedings of the 26th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2015).*
33. Sungjin Im, Benjamin Moseley, Kirk Pruhs and Eric Torng  
Competitively Scheduling Tasks with Intermediate Parallelizability  
*In Proceedings of the 26th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2014).*
34. Antonios Antoniadis, Neal Barcelo, Daniel Cole, Kyle Fox, Benjamin Moseley, Michael Nugent and Kirk Pruhs  
Packet Forwarding Algorithms in a Line Network  
*In Proceedings of the 11th Latin American Theoretical Informatics Symposium (LATIN 2014).*
35. Antonios Antoniadis, Sungjin Im, Ravishankar Krishnaswamy, Vishwanath Nagarajan, Benjamin Moseley, Kirk Pruhs and Cliff Stein  
Hallucination Helps: Energy Efficient Virtual Circuit Routing  
*In Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014).*
36. Sungjin Im and Benjamin Moseley  
New Approximations for Reordering Buffer Management  
*In Proceedings of the 25th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014).*
37. Kyle Fox, Sungjin Im, Janardhan Kulkarni and Benjamin Moseley  
Online Non-clairvoyant Scheduling to Simultaneously Minimize All Convex Functions  
*In Proceedings of the 16th International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX 2013).*
38. Ravi Kumar, Benjamin Moseley, Sergei Vassilvitskii and Andrea Vattani  
Fast Greedy Algorithms in MapReduce and Streaming  
*In Proceedings of the 25th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2013).*

**Awarded Best Paper**

39. Sungjin Im and Benjamin Moseley  
Online Batch Scheduling for Flow Objectives  
*In Proceedings of the 25th Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2013). Brief Announcement.*
40. Arpita Ghosh, Satyen Kale, Kevin Lang and Benjamin Moseley  
Bargaining for Revenue Shares on Tree Trading Networks  
*In Proceedings of the 23rd International Joint Conference on Artificial Intelligence (IJCAI 2013).*
41. Benjamin Moseley, Kirk Pruhs and Cliff Stein  
The Complexity of Scheduling for p-norms of Flow and Stretch  
*In Proceedings of the 16th Conference on Integer Programming and Combinatorial Optimization (IPCO 2013).*
42. Kyle Fox, Sungjin Im and Benjamin Moseley  
Energy Efficient Scheduling of Parallelizable Jobs  
*In Proceedings of the 24th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2013).*
43. Neal Barcelo, Sungjin Im, Benjamin Moseley and Kirk Pruhs  
Shortest-Elapsed-Time-First on a Multiprocessor  
*In Proceedings of the Mediterranean Conference on Algorithms (MedAlg 2012).*
44. Bahman Bahmani, Benjamin Moseley, Andrea Vattani, Ravi Kumar and Sergei Vassilvitskii  
Scalable K-Means++  
*In Proceedings of the International Conference on Very Large Data Bases (VLDB 2012).*
45. Kevin Lang, Benjamin Moseley and Sergei Vassilvitskii  
Handling Forecast Errors while Bidding for Display Advertising  
*In Proceedings of the International Conference on World Wide Web (WWW 2012).*
46. Sungjin Im, Benjamin Moseley and Kirk Pruhs  
Online Scheduling with General Cost Functions  
*In Proceedings of the 23rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2012)*
47. Anupam Gupta, Sungjin Im, Ravishankar Krishnaswamy, Benjamin Moseley and Kirk Pruhs  
Scheduling Heterogeneous Processors Isn't As Easy As You Think  
*In Proceedings of the 23rd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2012)*
48. Alina Ene, Sungjin Im and Benjamin Moseley  
Fast Clustering using MapReduce  
*In Proceedings of the 17th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2011)*
49. Silvio Lattanzi, Benjamin Moseley, Siddharth Suri and Sergei Vassilvitskii  
Filtering: A Method for Solving Graph Problems in MapReduce  
*In Proceedings of the 23rd Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2011)*
50. Benjamin Moseley, Anirban Dasgupta, Ravi Kumar and Tamas Sarlos  
On Scheduling in Map-Reduce and Flow-Shops  
*In Proceedings of the 23rd Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2011)*
51. Kyle Fox and Benjamin Moseley  
Online Scheduling on Identical Machines using SRPT  
*In Proceedings of the 22nd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2011)*
52. Jeff Edmonds, Sungjin Im and Benjamin Moseley  
Online Scalable Scheduling for the  $\ell_k$ -norms of Flow Time Without Conservation of Work  
*In Proceedings of the 22nd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2011)*

53. Sungjin Im and Benjamin Moseley  
An Online Scalable Algorithm for Minimizing  $\ell_k$ -norms of Weighted Flow Time on Unrelated Machines  
*In Proceedings of the 22nd Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2011)*
  54. Chandra Chekuri, Avigdor Gal, Sungjin Im, Samir Khuller, Jian Li, Richard McCutchen, Benjamin Moseley and Louiqa Raschid  
New Models and Algorithms for Throughput Maximization in Broadcast Scheduling  
*In Proceedings of the 8th Workshop on Approximation and Online Algorithms (WAOA 2010)*
  55. Anupam Gupta, Sungjin Im, Ravishankar Krishnaswamy, Benjamin Moseley and Kirk Pruhs  
Scheduling Jobs with Varying Parallelizability to Reduce Variance  
*In Proceedings of the 22nd Annual ACM Symposium on Parallel Algorithms and Architectures (SPAA 2010)*
  56. Sungjin Im and Benjamin Moseley  
An Online Scalable Algorithm for Average Flow Time in Broadcast Scheduling  
*In Proceedings of the 21st Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2010)*  
**Awarded Best Student Paper**
  57. Chandra Chekuri, Sungjin Im and Benjamin Moseley  
Longest Wait First for Broadcast Scheduling  
*In Proceedings of the 7th Workshop on Approximation and Online Algorithms (WAOA 2009)*
  58. Chandra Chekuri, Sungjin Im and Benjamin Moseley  
Minimizing Maximum Response Time and Delay Factor in Broadcast Scheduling  
*In Proceedings of the 17th Annual European Symposium on Algorithms (ESA 2009)*
  59. Chandra Chekuri and Benjamin Moseley  
Online Scheduling to Minimize the Maximum Delay Factor.  
*In Proceedings of the 20th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2009)*
- REFEREED JOURNAL PAPERS
60. Varun Gupta, Benjamin Moseley, Marc Uetz and Qiaomin Xie  
Greed Works - Online Algorithms For Unrelated Machine Stochastic Scheduling  
*To appear in Mathematics of Operations Research (MOR). Accepted 12/2018.*
  61. Kyle Fox, Sungjin Im and Benjamin Moseley. Energy Efficient Scheduling of Parallelizable Jobs. *Theoretical Computer Science*. 726: 30-40. 2018.
  62. Roozbeh Ebrahimi, Samuel McCauley and Benjamin Moseley. Scheduling Parallel Jobs Online with Convex and Concave Parallelizability. *Theory of Computing Systems*. 62(2): 304-318 (2018). **Special Issue for best papers at WAOA 2015.**
  63. Shalmoli Gupta, Ravi Kumar, Kefu Lu, Benjamin Moseley, and Sergei Vassilvitskii  
Local Search Methods for k-Means with Outliers  
*In Proceedings of the International Conference on Very Large Data Bases 10(7): 757-768 (2017).*
  64. Michael A. Bender, Jonathan W Berry, Simon Hammond, Karl Hemmert, Samuel McCauley, Branden Moore, Benjamin Moseley, Cynthia A Phillips, David Resnick, and Arun Rodrigues  
Two-Level Main Memory Co-Design: Multi-Threaded Algorithmic Primitives, Analysis, and Simulation  
*Journal of Parallel and Distributed Computing*. **Special Issue for best papers at IPDPS 2015**. 102: 213-228 (2017).
  65. Sungjin Im, Benjamin Moseley, Kirk Pruhs and Eric Torng  
Competitively Scheduling Tasks with Intermediate Parallelizability

*In ACM Transactions on Parallel Computing* **Special Issue for best papers at SPAA 2014**. 3(1): 4 (2016).

66. Ravi Kumar, Benjamin Moseley, Sergei Vassilvitskii and Andrea Vattani  
Fast Greedy Algorithms in MapReduce and Streaming  
*In ACM Transactions on Parallel Computing: Special Issue for best papers at SPAA 2013*. 2(3): 14 (2015).
67. Benjamin Moseley  
Scheduling to Minimize Energy and Flow Time in Broadcast Scheduling  
*In Journal of Scheduling*. 18(1): 107-118 (2015).
68. Sungjin Im, Benjamin Moseley and Kirk Pruhs  
Online Scheduling with General Cost Functions  
*In SIAM Journal on Computing*. 43(1): 126-143 (2014).
69. Daniel Cole, Sungjin Im, Benjamin Moseley and Kirk Pruhs  
Speed Scaling for Total Stretch Plus Energy  
*In Operations Research Letters*. 40(3): 180-184 (2012).
70. Bahman Bahmani, Benjamin Moseley, Andrea Vattani, Ravi Kumar and Sergei Vassilvitskii  
Scalable K-Means++  
*In Proceedings of the International Conference on Very Large Data Bases*. 5(7): 622-633 (2012).
71. Chandra Chekuri, Sungjin Im and Benjamin Moseley  
On Scheduling to Minimize Maximum Response Time and Maximum Delay Factor  
*In Theory of Computing: Special Issue in honor of Rajeev Motwani*. 8(1): 165-195 (2012).
72. Sungjin Im and Benjamin Moseley  
An Online Scalable Algorithm for Average Flow Time in Broadcast Scheduling  
*In ACM Transactions on Algorithms*. 8(4): 39 (2012)
73. Sungjin Im, Benjamin Moseley and Kirk Pruhs  
A Tutorial on Amortized Local Competitiveness in Online Scheduling  
*In SIGACT News*. 42(2): 83-97 (2011).

#### TUTORIALS

#### FUNDING

- NSF: CAREER: Pushing the Theoretical Limits of Scalable Distributed Algorithms. Moseley, PI. Total \$500,000. 7/01/2019-6/30/2024.
- Infor Faculty Award. Moseley, PI. 2018. Total: \$100,000. (Gift).
- NSF: SPX: Collaborative Research: Harnessing the Power of High-Bandwidth Memory via Provably Efficient Parallel Algorithms. Moseley, PI. Total: \$249,999. 09/15/17-8/31/2021.
- NSF: AITF: Applied Algorithmic Foundation for Scheduling Multiprogrammed Parallelizable Workloads. Moseley, PI. Co-PIs Kunal Agrawal (WashU) and Angelina Lee (WashU). Total: \$650,000 . 10/1/17-9/30/21.
- NSF: AF Small: Collaborative Research: Algorithmic and Computational Frontiers of MapReduce for Big Data Analysis. Moseley, PI. 2016. Total: \$252,767. 7/1/16-6/30/19.
- NSF: REU Site: Big Data Analytics. Sanmay Das, PI. Moseley, Senior Personnel. 2016. Total: \$359,111. 4/2/16-3/31/19.
- Yahoo! Academic Career Enhancement (ACE) Award. Moseley, PI. 2015. Total \$10,000 (Gift)
- Google Faculty Research Award: "Fast Distributed Algorithms for Clustering Data". Moseley, PI. 2015. Total: \$31,845 (Gift)

#### PHD STUDENTS

- Kefu Lu. Entered Fall 2014. Graduation August 2018 (expected). First position: Assistant Professor at Washington and Lee University.
- Thomas Lavastida. Entered Fall 2017.
- Yuyan Wang. Entered Fall 2017.
- Rudy Zhou. Entered Fall 2018.

UNDERGRADUATE  
ADVISEES

- Matt Abbott. 2017 Summer REU.
- Bryce Bagley. 2017 Spring independent study and Summer. → PhD Stanford in Biophysics.
- Geoff Converse. 2016 Summer REU. → PhD University of Iowa in Math.
- Alyssa Shofner. 2016 Summer REU.
- Blakeley Hoffman. 2015 Summer REU and independent study Fall 2015. → Student at MIT CS.
- Roman Blum. 2015 research project. → PhD Brown University in CS.
- Diqui Zhou. 2015 research project.

PHD THESIS  
COMMITTEES

- Matt Kusner (Washington University in St. Louis). First position: Postdoc at the Alan Turing Institute. Currently an Assistant Professor at Oxford.

INVITED  
PRESENTATIONS

- 2018 Johns Hopkins University
- 2018 Carnegie Mellon University, SQUALL Seminar
- 2018 Open Problem Presentation at the TTIC Summer Workshop on Data Center Scheduling
- 2018 TTIC Summer Workshop on Data Center Scheduling from Theory to Practice
- 2018 International Symposium on Mathematical Programming (ISMP)
- 2018 Carnegie Mellon University, Machine Learning Seminar
- 2018 Carnegie Mellon University, Operations Research Seminar
- 2018 Carnegie Mellon University, Combinatorial Optimization Seminar
- 2017 George Washington University
- 2017 University of Chicago
- 2017 Carnegie Mellon University
- 2017 Columbia University
- 2017 Saint Louis University
- 2016 Simons Institute at UC-Berkeley
- 2016 Stanford University
- 2016 LogicBlox
- 2016 Technical University of Munich
- 2015 Workshop at STOC 2015. Algorithmic Frontiers of Modern Massively Parallel Computation
- 2014 University of California Merced
- 2014 University of Pittsburgh
- 2014 Dartmouth College
- 2014 Virginia Tech
- 2014 Columbia University
- 2013 Northwestern University
- 2013 Washington University
- 2013 University of Illinois at Chicago
- 2013 Dagstuhl seminar on scheduling
- 2013 University of Chicago
- 2012 University of Minnesota
- 2012 Yahoo
- 2012 Google
- 2012 Oregon State University
- 2012 University of Buffalo
- 2012 Toyota Technological Institute at Chicago
- 2012 Sandia National Laboratories
- 2012 Shonan meeting on large-scale distributed computation

CONFERENCE  
AND WORKSHOP  
PRESENTATIONS

- “Submodular Optimization with Contention Resolution Extensions”. Informs 2018. Phoenix, AZ.
- “Fair Scheduling via Iterative Quasi-Uniform Sampling”. SODA 2017. Barcelona, Spain.
- “General Profit Scheduling and the Power of Migration on Heterogeneous Machines”. SPAA 2016. Monterey, CA.
- “Scheduling Parallel DAG Jobs to Minimize the Average Flow Time”. New Challenges in Scheduling Theory. Aussois, France.
- “Scheduling in Bandwidth Constrained Tree Networks”. Portland, OR. SPAA 2015.



- “Fast and Better Distributed MapReduce Algorithms for k-Center Clustering”. Portland, OR. SPAA 2015.
- “Online Non-clairvoyant Scheduling to Simultaneously Minimize All Convex Functions”. La Roche-en-Ardenne, Belgium. MAPSP 2015.
- “Two-Level Main Memory Co-Design: Multi-Threaded Algorithmic Primitives, Analysis, and Simulation”. Hyderabad, India. IPDPS 2015. Best Paper plenary presentation.
- “Competitively Scheduling Tasks with Intermediate Parallelizability”. Prague, Czech Republic. SPAA 2014.
- “New Approximations for Reordering Buffer Management”. Portland, OR. SODA 2014.
- “Bargaining for Revenue Shares on Tree Trading Networks”. Beijing, China. IJCAI 2013.
- “Fast Greedy Algorithms in MapReduce and Streaming”. Montreal, Canada. SPAA 2013. Best paper presentation.
- “Online Batch Scheduling for Flow Objectives”. Montreal, Canada. SPAA 2013.
- “The Complexity of Scheduling for p-norms of Flow and Stretch”. Valparaiso, Chile. IPCO 2013.
- “Scheduling Heterogeneous Processors Isn’t As Easy As You Think”. Kyoto, Japan. SODA 2012.
- “Fast Clustering using MapReduce”. Chicago, IL. Midwest Theory Day 2012 at Northwestern.
- “Filtering: A Method for Solving Graph Problems in MapReduce”. San Jose, CA. SPAA 2011.
- “On Scheduling in Map-Reduce and Flow-Shops”. San Jose, CA. SPAA 2011.
- “An Online Scalable Algorithm for Minimizing  $\ell_k$ -norms of Weighted Flow Time on Unrelated Machines”. San Francisco, CA. SODA 2011.
- “An Online Scalable Algorithm for Average Flow Time in Broadcast Scheduling”. Austin, TX. SODA 2010. Best Student Paper presentation.
- “Online Scheduling to Minimize the Maximum Delay Factor”.
  - New York, NY. SODA 2009.
  - Chicago, IL. Midwest Theory Day 2008 at Northwestern.

#### INSTRUCTION

**Carnegie Mellon University:** Numbers in the right margin are student evaluations of instructor/course quality (maximum 5.0/5.0).

Spring 2018	70-257: Optimization for Business (Section 1)	undergrad	55 Students	(4.48/4.33)
Spring 2018	70-257: Optimization for Business (Section 2)	undergrad	53 Students	(4.42/4.5)

**Washington University:** Numbers in the right margin are student evaluations of instructor/course quality (maximum 7.0/7.0).

Fall 2017	CSE 240: Logic and Discrete Mathematics	undergrad	174 Students	(6.04/5.95)
Fall 2017	CSE 544: Special Topics	grad	3 Students	(NA/NA)
Spring 2017	CSE 581: Approximation Algorithms	grad	29 Students	(6.62/6.69)
Fall 2015	CSE 240: Logic and Discrete Mathematics	undergrad	174 Students	(5.67/5.18)
Spring 2015	CSE 240: Logic and Discrete Mathematics	undergrad	67 Students	(6.52/6.33)
Fall 2014	CSE 581: Approximation Algorithms	grad	15 Students	(6.22/6.00)

#### PROFESSIONAL ACTIVITIES

- Editorial Boards
  - Associate Editor for Operations Research Letters
  - Associate Editor for IEEE Transactions on Knowledge and Data Engineering (TKDE)
- Guest Editor
  - Special Issue of Journal of Scheduling devoted to selected papers from the 2019 Workshop on Models and Algorithms for Planing and Scheduling Problems (MAPSP 2019)
  - Special Issue of Journal of Scheduling devoted to selected papers from the 2018 Seminar on New Challenges in Scheduling Theory
  - Special Issue of Journal of Scheduling devoted to selected papers from the 2016 Seminar on New Challenges in Scheduling Theory
  - Special Issue of Journal of Scheduling devoted to selected papers from the 2014 Seminar on New Challenges in Scheduling Theory

- Program committee member for:
  - International Conference on Machine Learning (ICML 2019)
  - Workshop on Models and Algorithms for Planning and Scheduling Problems 2019 (MAPSP 2019)
  - IEEE International Parallel & Distributed Processing Symposium 2019 (IPDPS 2019)
  - International Conference on Web Search and Data Mining (WSDM 2018)
  - Conference on Artificial Intelligence (AAAI 2018)
  - ACM-SIAM Symposium on Discrete Algorithms (SODA 2018)
  - Knowledge Discovery, Data Mining, and Data Science Research (KDD 2017, Senior Program committee)
  - European Symposium on Algorithms Track B (ESA 2017)
  - International Conference on Parallel Processing (ICPP 2017)
  - International Conference on Artificial Intelligence and Statistics (AISTATS 2017)
  - IEEE International Parallel & Distributed Processing Symposium 2017 (IPDPS 2017)
  - International Conference on Web Search and Data Mining (WSDM 2016)
  - International Conference on High Performance Computing, Data and Analytics (HiPC 2016)
  - Workshop on Approximation and Online Algorithms (WAOA 2016)
  - IEEE International Parallel & Distributed Processing Symposium 2016 (IPDPS 2016)
  - ACM Symposium on Parallelism in Algorithms and Architectures 2016 (SPAA 2016)
  - Workshop on Models and Algorithms for Planning and Scheduling Problems 2015 (MAPSP 2015)
  - International Computing and Combinatorics Conference 2015 (COCOON 2015)
  - International Computing and Combinatorics Conference 2014 (COCOON 2014)
  - International Symposium on Algorithms and Computation 2013 (ISAAC 2013)
  - Workshop on Approximation and Online Algorithms (WAOA 2013)
- Organizer:
  - Workshop on New Challenges in Scheduling Theory 2018. Aussois, France.
  - Workshop on New Challenges in Scheduling Theory 2016. Aussois, France.
  - Workshop on New Challenges in Scheduling Theory 2014. Aussois, France.
- Reviewer or referee for:
  - Symposium on Foundations of Computer Science (FOCS)
  - Symposium on the Theory of Computing (STOC)
  - Symposium on Discrete Algorithms (SODA)
  - Neural Information Processing Systems (NIPS)
  - International Colloquium on Automata, Languages and Programming (ICALP)
  - European Symposium on Algorithms (ESA)
  - International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)
  - International European Conference on Parallel and Distributed Computing (Euro-Par)
  - Workshop on Approximation and Online Algorithms (WAOA)
  - Symposium on Theoretical Aspects of Computer Science (STACS)
  - Latin American Theoretical Informatics Symposium (LATIN)
  - Innovations in Theoretical Computer Science (ITCS)
  - Integer Programming and Combinatorial Optimization (IPCO)
  - ACM Symposium on Parallel Algorithms and Architectures (SPAA)

- ACM Transactions on Algorithms (TALG)
- Operations Research
- Algorithmica
- Journal of Scheduling (JoS)
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- Concurrency and Computation: Practice and Experience
- Networks
- IEEE Transactions on Signal Processing
- Theory of Computing Systems
- Parallel Computing
- Mathematics of Operations Research
- International Journal of Information and Communication Technology (IJICT)
- IEEE Transactions on Signal Processing
- Journal of Combinatorial Optimization
- Journal of Computer Science and Technology (JCST)
- Journal of Computer and System Sciences (JCSS)
- Transactions on Cloud Computing