

**SHI LI**  
Assistant Professor,  
Department of Computer Science and Engineering,  
University at Buffalo

University at Buffalo  
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#### BIO & EDUCATION

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- 2015 - present: Assistant Professor at University at Buffalo
- 2013 - 2015: Research Assistant Professor at Toyota Technological Institute at Chicago
- 2008 - 2013: Ph.D. in Computer Science at Princeton University  
Advisor: Prof. Moses Charikar
- 2004 - 2008: B.S. in Computer Science at Tsinghua University
- 2005 - 2008: Andrew Chi-Chi Yao's Special Pilot Class

#### RESEARCH INTERESTS

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Broadly speaking, my research area is theoretical computer science. Specifically, I am interested in designing and analyzing approximation algorithms for NP-hard combinatorial problems. The main types of problems I worked on include facility location problems, clustering, network routing, network design, resource allocation and scheduling problems.

#### TEACHING

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- Fall 2016: CSE 431/531: Analysis of Algorithms
- Spring 2016: CSE 431/531: Analysis of Algorithms
- Fall 2015: CSE 712: Advanced Topics in Algorithm Design
- Winter 2015: EECSE 336: Design and Analysis of Algorithms, Northwestern University
- Fall 2014: Co-Teacher, Information and Coding Theory, TTIC
- Spring 2010: Teaching Assistant, Cryptography, Princeton University
- Fall 2009: Teaching Assistant, Operating Systems, Princeton University

#### CURRENT STUDENTS

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- Alex Stachnik
- Minwei Ye (co-advising with Prof. Jinhui Xu)

#### EMPLOYMENT

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- Assistant Professor, University at Buffalo, 2015 to present
- Research Assistant Professor at Toyota Technological Institute at Chicago, 2013 to 2015
- Research Assistantship at Princeton University, 2008 to 2013  
Advisor: Prof. Moses Charikar
- Internship at Bell Labs, Summer 2012  
Mentor: Matthew Andrews
- Internship at Toyota Technological Institution at Chicago, Summer 2011  
Mentor: Prof. Julia Chuzhoy
- Visiting Microsoft Research Asia, Beijing, China, Fall 2003  
Mentor: Prof. Xiangyang Li

## GRANTS

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- NSF CCF-1566356, CRII:AF: On Designing Approximation Algorithms Based on Round-or-Cut Paradigm, Mar 2016 to August 2018

## AWARDS

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- **FOCS 2012 Best Paper Award:** A Polylogarithmic Approximation for Edge-Disjoint Paths with Congestion 2
- **ICALP 2011 Best Student Paper Award, Track A:** A 1.488 Approximation Algorithm for the Uncapacitated Facility Location Problem
- A Wallace Memorial Fellowship by Princeton University for the 2012-2013 academic year
- A Gold Medal in the International Olympiad in Informatics, 2004
- A Gold Medal in the Chinese National Olympiad in Informatics, 2003
- The 1st place in the 30th ACM/ICPC Regional Asia, Chengdu
- National Scholarships in 2005 and 2006, by Tsinghua University
- A Freshmen Scholarship in 2004, by Tsinghua University
- A Distinguished Thesis Award, by Tsinghua University, 2008

## PUBLICATIONS

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### Conference Papers:

- Sungjin Im, Shi Li and Benjamin Moseley, Breaking  $1-1/e$  Barrier for Non-preemptive Throughput Maximization, IPCO 2017
- Shi Li, Constant Approximation Algorithm for Non-Uniform Capacitated Multi-Item Lot-Sizing via Strong Covering Inequalities, SODA 2017
- Arkadev Chattopadhyay, Michael Langberg, Shi Li and Atri Rudra, Tight Network Topology Dependent Bounds on Rounds of Communication, SODA 2017
- Sungjin Im and Shi Li, Better Unrelated Machine Scheduling for Weighted Completion Time via Random Offsets from Non-Uniform Distributions, FOCS 2016
- Gokalp Demirci and Shi Li, Constant Approximation for Capacitated  $k$ -Median with  $(1 + \epsilon)$ -Capacity Violation, ICALP 2016
- Julia Chuzhoy, David Kim and Shi Li, Improved Approximation for Node-Disjoint Paths in Planar Graphs, STOC 2016
- Shi Li, Approximating Capacitated  $k$ -Median with  $(1 + \epsilon)k$  Open Facilities, SODA 2016
- Deeparnab Chakrabarty, Sanjeev Khanna, and Shi Li, On  $(1, \epsilon)$ -Restricted Assignment Makespan Minimization, SODA 2015
- Sungjin Im, Benjamin Moseley, Shi Li and Eric Torng, A Dynamic Programming Framework for Non-Preemptive Scheduling Problems on Multiple Machines, SODA 2015
- Shi Li, On Uniform Capacitated  $k$ -Median beyond the Natural LP Relaxation, SODA 2015
- Nikhil Bansal, Moses Charikar, Ravishankar Krishnaswamy and Shi Li, Better Algorithms and Hardness for Broadcast Scheduling via a Discrepancy Approach, SODA 2014
- Mohammadtaghi Hajiaghayi, Wei Hu, Jian Li, Shi Li and Barna Saha, A Constant Factor Approximation Algorithm for Fault-Tolerant  $k$ -Median, SODA 2014
- Deeparnab Chakrabarty, Ravishankar Krishnaswamy, Shi Li and Srivatsan Narayanan, Capacitated Network Design on Undirected Graphs, APPROX and RANDOM 2013

- Shi Li and Ola Svensson, Approximating  $k$ -Median via Pseudo-Approximation, STOC 2013
- Julia Chuzhoy and Shi Li, A Polylogarithmic Approximation for Edge-Disjoint-Paths with Congestion 2, FOCS 2012
- Moses Charikar and Shi Li, A Dependent LP-Rounding Approach for the  $k$ -Median Problem, ICALP 2012
- Parinya Chalermsook, Julia Chuzhoy Alina Ene, and Shi Li, Approximation Algorithms and Hardness of Integral Concurrent Flow, STOC 2012
- Shi Li, A 1.488-Approximation Algorithm for the Uncapacitated Facility Location Problem, ICALP 2011
- Moses Charikar, Tom Leighton, Shi Li and Ankur Moitra, Vertex Sparsifiers and Abstract Rounding Algorithms, FOCS 2010
- Shi Li, Xiang-Yang Li and YunHao Liu, Capacity of Large Scale Wireless Networks under Gaussian Channel Model, Mobicom 2008

Journal Papers:

- A Polylogarithmic Approximation Algorithm for Edge-Disjoint Paths with Congestion 2, Shi Li, Julia Chuzhoy, Journal of ACM 63(5), Dec 2016
- Shabbir Ahmed, Qie He, Shi Li and George Nemhauser, On the Computational Complexity of Minimum-Concave-Cost Flow in a Two-Dimensional Grid, SIAM Journal on Optimization
- Shi Li, On Uniform Capacitated  $k$ -Median beyond the Natural LP Relaxation, Transactions on Algorithms
- Shi Li and Ola Svensson, Approximating  $k$ -Median via Pseudo-Approximation, SIAM Journal on Computing 45(2), 2016
- Mohammadtaghi Hajiaghayi, Wei Hu, Jian Li, Shi Li and Barna Saha, A Constant Factor Approximation Algorithm for Fault-Tolerant  $k$ -Median, Transactions on Algorithms 12(3), June 2016
- Shi Li and Gabriel Tucci, Traffic Congestion in Expanders and  $(p, \delta)$ -Hyperbolic Spaces, Internet Mathematics 11(2), 2015
- Shi Li, A 1.488-Approximation Algorithm for the Uncapacitated Facility Location Problem, Information and Computation 222, January 2013
- Xiang-Yang Li, Shi Li, Yunhao Liu and Shaojie Tang, Multicast Capacity of Wireless Ad Hoc Networks Under Gaussian Channel Model, Transactions on Networking 18(4), 2010

Preprints:

- Shi Li, Scheduling to Minimize Total Weighted Completion Time via Time-Indexed Linear Programming Relaxations

SERVICES

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- Program Committee Member of APPROX + RANDOM 2017 (upcoming)
- Local Committee Member of FWCG 2015
- NSF Panel Review in Spring 2016