

# Karthekeyan Chandrasekaran

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CONTACT INFORMATION	301 Transportation Building 104 S. Mathews Ave Urbana, IL 61801 <i>Phone:</i> 217-300-1160 <i>Email:</i> karthe@illinois.edu <i>URL:</i> <a href="http://karthik.ise.illinois.edu">http://karthik.ise.illinois.edu</a>	
RESEARCH INTERESTS	Optimization, Integer Programming, Probabilistic Methods and Analysis, Randomization	
EDUCATION	<b>Ph.D., Algorithms, Combinatorics, and Optimization</b> Georgia Institute of Technology, Atlanta	Aug, 2012
	<b>B.Tech., Computer Science and Engineering</b> Indian Institute of Technology, Madras	Jun, 2007
APPOINTMENTS	<b>Assistant Professor</b> University of Illinois at Urbana-Champaign, IL Department of Industrial and Enterprise Systems Engineering	Sep, 2014-present
	<b>Affiliate Assistant Professor</b> University of Illinois at Urbana-Champaign, IL Department of Computer Science	Sep, 2014-present
	<b>Simons Postdoctoral Research Fellow</b> Harvard University, Cambridge, MA School of Engineering and Applied Sciences Host: Salil Vadhan	Sep, 2012-Aug, 2014
	<b>Visiting Researcher</b> International Computer Science Institute (ICSI), Berkeley, CA Algorithms Group Host: Richard Karp	Jul-Oct, 2011
	<b>Research Intern</b> Microsoft Research, Bangalore, India Algorithms Research Group Host: Navin Goyal Host: Amit Deshpande	May-Jul, 2009 May-Jul, 2008
	Applied Mathematics Group Host: Satya V. Lokam	May-Jul, 2007
	Microsoft Research, Redmond, WA Algorithms Group Host: Ramarathnam Venkatesan	Jun-Aug, 2006

- TEACHING      **Integer Programming**, IE 511 (Graduate), Spring 2017  
**Operations Research & Lab**, IE 310, IE 311 (Undergraduate), Fall 2016  
**Operations Research & Lab**, IE 310, IE 311 (Undergraduate), Spring 2016  
**Combinatorial Optimization**, IE 598 (Graduate), Fall 2015  
**Integer Programming**, IE 511 (Graduate), Spring 2015  
- University of Illinois, Urbana-Champaign
- STUDENTS      PhD Advisees: Chao Xu (UIUC)  
Undergrad advisees: Jingwen Jiang (2015-16, currently PhD student at Univ. of Chicago)
- PUBLICATIONS      **Shift Lifts Preserving Ramanujan Property**  
(with A. Velingker)  
- (To appear in) Linear Algebra and its Applications, Sep, 2017
- Local Testing for Membership in Lattices**  
(with M. Cheraghchi, V. Gandikota, E. Grigorescu)  
- Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2016), Dec 2016
- Deciding Orthogonality in Construction-A Lattices**  
(with V. Gandikota, E. Grigorescu)  
- (To appear in) SIAM Journal on Discrete Mathematics  
- Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2015), Dec 2015
- Finding Small Stabilizers for Unstable Graphs**  
(with A. Bock, J. Könemann, B. Peis, L. Sanità)  
- Mathematical Programming, Series B, Dec 2014  
- Prelim. version in Integer Programming and Combinatorial Optimization (IPCO 2014), Jun 2014
- Finding a Most Biased Coin with Fewest Flips**  
(with R. Karp)  
- Conference on Learning Theory (COLT 2014), Jun 2014
- Faster Private Release of Marginals on Small Databases**  
(with J. Thaler, J. Ullman, A. Wan)  
- Innovations in Theoretical Computer Science (ITCS 2014), Jan 2014
- Integer Feasibility of Random Polytopes**  
(with S. Vempala)  
- Innovations in Theoretical Computer Science (ITCS 2014), Jan 2014
- The Cutting Plane Algorithm is Polynomial for Perfect Matchings**  
(with L. Végh, S. Vempala)  
- Mathematics of Operations Research, Vol 41, No. 1, 2016  
- Prelim. version in IEEE Symposium on Foundations of Computer Science (FOCS 2012), Oct 2012
- Algorithms for Implicit Hitting Set Problems**  
(with R. Karp, E. Moreno-Centeno, S. Vempala)  
- ACM-SIAM Symposium on Discrete Algorithms (SODA11), Jan 2011
- Deterministic Algorithms for the Lovász Local Lemma**  
(with N. Goyal, B. Haeupler)  
- SIAM Journal on Computing, Vol. 42, Issue 6, 2013  
- Prelim. version in ACM-SIAM Symposium on Discrete Algorithms (SODA10), Jan 2010

**Thin Partitions: Isoperimetric Inequalities and Sampling Algorithms for some Non-convex Families**

(with D. Dadush, S. Vempala)

- ACM-SIAM Symposium on Discrete Algorithms (SODA10), Jan 2010

**Sampling s-Concave Functions**

(with A. Deshpande, S. Vempala)

- 13th International Workshop on Randomization and Computation (RANDOM 2009), Aug 2009

**An Observation about Variations of the Diffie-Hellman Assumption**

(with R. Bhaskar, S. V. Lokam, P. L. Montgomery, R. Venkatesan, Y. Yacobi)

- Serdica Journal of Computing, Vol. 3, No. 3, 2009

**Vulnerabilities in Anonymous Credential Systems**

(with R. Bhaskar, S. V. Lokam, P. L. Montgomery, R. Venkatesan, Y. Yacobi)

- Electronic Notes in Theoretical Computer Science, Vol. 197, No. 2, 2008

IN REVIEW

**Global and fixed-terminal cuts in digraphs**

(with K. Bérczi, T. Király, E. Lee, C. Xu)

**Largest Eigenvalue and Invertibility of Symmetric Matrix Signings**

(with C. Carlson, H-C. Chang, A. Kolla)

**Additive Stabilizers for Unstable Graphs**

(with C. Gottschalk, J. Könnemann, B. Peis, D. Schmand, A. Wierz)

**On the Expansion of Group-Based Lifts**

(with N. Agarwal, A. Kolla, V. Madan)

TALKS

**Global and fixed-terminal cuts in digraphs**

Midwest Theory Day, Indiana University, Bloomington

Apr, 2017

ACO25, Georgia Institute of Technology, Atlanta

Jan, 2017

**Lattice Optimization**

University of Illinois, Urbana-Champaign

Apr, 2016

**Stabilizers for Unstable Graphs**

INFORMS '16, Nashville

Nov, 2016

Workshop in Current Trends in Combinatorial Optimization, Shonan, Japan

Apr, 2016

ISMP '15, Pittsburgh

Jul, 2015

**Local Testing for Membership in Lattices**

Hausdorff Institute for Mathematics, Bonn, Germany

Nov, 2015

University of Illinois, Urbana-Champaign

Sep, 2015

**Finding Small Stabilizers for Unstable Graphs**

INFORMS '14, San Francisco

Nov, 2014

Purdue University, West Lafayette

Oct, 2014

University of Illinois, Urbana-Champaign

Sep, 2014

Flexible Network Design Workshop, Lugano, Switzerland

Aug, 2014

<b>Finding a Most Biased with Fewest Flips</b>	
EPFL, Lausanne, Switzerland	Jul, 2014
RWTH Aachen University, Aachen, Germany	Jun, 2014
Conference on Learning Theory 2014, Barcelona, Spain	Jun, 2014
<b>Integer Feasibility of Random Polytopes</b>	
Microsoft Research, Redmond	Mar, 2014
Massachusetts Institute of Technology, Cambridge	Mar, 2014
Innovations in Theoretical Computer Science 2014, Princeton	Jan, 2014
<b>Faster Private Release of Marginals on Small Databases</b>	
University of Waterloo, Ontario, Canada	Oct, 2013
Purdue University, West Lafayette	Sep, 2013
<b>A Polynomial-time Cutting Plane Algorithm for Perfect Matchings</b>	
Northeastern University, Boston	Dec, 2013
Brown University, Providence	Oct, 2013
Flexible Network Design Workshop, Toronto, Canada	Aug, 2013
Bellairs Workshop on Combinatorial Optimization, Barbados	Apr, 2013
Carnegie Mellon University, Pittsburgh	Jan, 2013
IEEE Symposium on Foundations of Computer Science 2012, New Brunswick	Oct, 2012
Harvard University, Cambridge	Oct, 2012
Toyota Technological Institute, Chicago	Jun, 2012
<b>A Discrepancy based Approach to Integer Programming</b>	
Toyota Technological Institute, Chicago	Jun, 2012
SIAM Conference on Discrete Mathematics, Halifax, Canada	Jun, 2012
Workshop on Computation and Phase Transitions, Atlanta	Jun, 2012
Discrete Optimization Seminar, Georgia Institute of Technology, Atlanta	Jan, 2012
INFORMS '11, Charlotte	Nov, 2011
Microsoft Research, Silicon Valley	Nov, 2011
IBM Research, Almaden	Sep, 2011
University of California, Berkeley	Aug, 2011
<b>Algorithms for Implicit Hitting Set Problems</b>	
Random Structures and Algorithms, Atlanta	May, 2011
ACM-SIAM Symposium on Discrete Algorithms 2011, San Francisco	Jan, 2011
Microsoft Research, Bangalore, India	Dec, 2010
Indian Institute of Technology, Madras, India	Dec, 2010
ACO Student Seminar, Georgia Institute of Technology, Atlanta	Apr, 2010
<b>Algorithms for the Lovász Local Lemma</b>	
Indian Institute of Technology, Madras	Dec, 2010
Combinatorics Seminar, Georgia Institute of Technology, Atlanta	Sep, 2009
<b>Sampling Star-shaped Bodies</b>	
Microsoft Research, Bangalore, India	Jul, 2009
<b>Sampling s-Concave Functions</b>	
INFORMS '09, San Diego	Oct, 2009
RANDOM-APPROX 2009, Berkeley	Aug, 2009
Microsoft Research, Bangalore, India	Jun, 2009

AWARDS AND  
HONORS

**Best Ph.D. Thesis Award**

Sigma Xi Chapter, Georgia Institute of Technology, 2013

**College of Computing Dissertation Prize**

Georgia Institute of Technology, 2012

**Algorithms and Randomness Center (ARC) Fellowship**

Georgia Institute of Technology, Fall 2010, Spring 2012

PROFESSIONAL  
SERVICE

**Reviewer for conferences**

– STOC (2017, 2016, 2015, 2011), SODA (2017, 2016, 2015), FOCS (2016, 2015, 2013, 2010), COLT (2016, 2014), IPCO (2016), PODS (2015), CCC (2014), FSTTCS (2013), LATIN (2012), RANDOM (2012), ALT (2012), NIPS (2010)

**Reviewer for journals**

– *SIAM Journal on Computing* (SICOMP), *Journal of Computer and System Sciences* (JCSS), *Mathematics of Operations Research*, *SIAM Journal on Discrete Mathematics* (SIDMA), *Transactions on Knowledge and Data Engineering*, *Mathematical Programming*, *Discrete Optimization*

**Session Organizer**

“Algorithmic Learning Theory”, The INFORMS Annual Meeting (2012), Phoenix

REFERENCES

Available upon request