

Karthekeyan Chandrasekaran

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> http://karthik.ise.illinois.edu	
RESEARCH INTERESTS	Optimization, Integer Programming, Probabilistic Methods and Analysis, Randomization	
EDUCATION	Ph.D., Algorithms, Combinatorics, and Optimization Georgia Institute of Technology, Atlanta	Aug, 2012
	B.Tech., Computer Science and Engineering Indian Institute of Technology, Madras	Jun, 2007
APPOINTMENTS	Assistant Professor University of Illinois at Urbana-Champaign, IL Department of Industrial and Enterprise Systems Engineering	Sep, 2014-present
	Affiliate Assistant Professor University of Illinois at Urbana-Champaign, IL Department of Computer Science	Sep, 2014-present
	Simons Postdoctoral Research Fellow Harvard University, Cambridge, MA School of Engineering and Applied Sciences Host: Salil Vadhan	Sep, 2012-Aug, 2014
	Visiting Researcher International Computer Science Institute (ICSI), Berkeley, CA Algorithms Group Host: Richard Karp	Jul-Oct, 2011
	Research Intern 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 **Operations Research & Lab**, IE 310, IE 311 (Undergraduate), Fall 2017
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**
- Sahand Mozaffari, UIUC (2016–present)
 - Chao Xu, UIUC (2016–present, joint with Prof. Chandra Chekuri)
- Undergrad advisees**
- Jingwen Jiang, UIUC (2015–16, currently PhD student at Univ. of Chicago)
- PUBLICATIONS **Lattice-based Locality Sensitive Hashing is Optimal**
(with D. Dadush, V. Gandikota, E. Grigorescu)
- (To appear in) Innovations in Theoretical Computer Science (ITCS'18), Jan 2018
- Hypergraph k -Cut in Randomized Polynomial Time**
(with C. Xu, X. Yu)
- (To appear in) ACM-SIAM Symposium on Discrete Algorithms (SODA'18), Jan 2018
- A tight $\sqrt{2}$ -approximation for Linear 3-Cut**
(with K. Bérczi, T. Király, V. Madan)
- (To appear in) ACM-SIAM Symposium on Discrete Algorithms (SODA'18), Jan 2018
- Graph Stabilization: A Survey**
- Combinatorial Optimization and Graph Algorithms: Communications of NII Shonan Meetings, 2017
- Odd Multiway Cut in Directed Acyclic Graphs**
(with S. Mozaffari)
- International Symposium on Parameterized and Exact Computation (IPEC'17), Sep 2017
- Global and fixed-terminal cuts in digraphs**
(with K. Bérczi, T. Király, E. Lee, C. Xu)
- International Workshop on Approximation Algorithms for Combinatorial Optimization Problems (APPROX'17), Aug 2017
- On the Expansion of Group-Based Lifts**
(with N. Agarwal, A. Kolla, V. Madan)
- International Workshop on Randomization and Computation (RANDOM'17), Aug 2017
- Shift Lifts Preserving Ramanujan Property**
(with A. Velingker)
- Linear Algebra and its Applications, Vol. 529, 2017
- Local Testing for Membership in Lattices**
(with M. Cheraghchi, V. Gandikota, E. Grigorescu)
- Foundations of Software Technology and Theoretical Computer Science (FSTTCS'16), Dec 2016

Deciding Orthogonality in Construction-A Lattices

(with V. Gandikota, E. Grigorescu)

- SIAM Journal on Discrete Mathematics, Vol. 31, Issue 1, 2017

- Prelim. version in Foundations of Software Technology and Theoretical Computer Science (FSTTCS'15), Dec 2015

Finding Small Stabilizers for Unstable Graphs

(with A. Bock, J. Könemann, B. Peis, L. Sanità)

- Mathematical Programming, Vol. 154, Issue 1, 2015

- Prelim. version in Integer Programming and Combinatorial Optimization (IPCO'14), Jun 2014

Finding a Most Biased Coin with Fewest Flips

(with R. Karp)

- Conference on Learning Theory (COLT'14), Jun 2014

Faster Private Release of Marginals on Small Databases

(with J. Thaler, J. Ullman, A. Wan)

- Innovations in Theoretical Computer Science (ITCS'14), Jan 2014

Integer Feasibility of Random Polytopes

(with S. Vempala)

- Innovations in Theoretical Computer Science (ITCS'14), 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'12), Oct 2012

Algorithms for Implicit Hitting Set Problems

(with R. Karp, E. Moreno-Centeno, S. Vempala)

- ACM-SIAM Symposium on Discrete Algorithms (SODA'11), 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 (SODA'10), 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 (SODA'10), Jan 2010

Sampling s -Concave Functions

(with A. Deshpande, S. Vempala)

- International Workshop on Randomization and Computation (RANDOM'09), 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

Beating the 2-approximation factor for Global Bicut
(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. Könemann, B. Peis, D. Schmand, A. Wierz)

TALKS

Beating the 2-factor for Bicut
University of Chicago, Chicago Nov, 2017

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

Finding a Most Biased with Fewest Flips
EPFL, Lausanne, Switzerland Jul, 2014
RWTH Aachen University, Aachen, Germany Jun, 2014
Conference on Learning Theory 2014, Barcelona, Spain Jun, 2014

Integer Feasibility of Random Polytopes
Microsoft Research, Redmond Mar, 2014
Massachusetts Institute of Technology, Cambridge Mar, 2014
Innovations in Theoretical Computer Science 2014, Princeton Jan, 2014

Faster Private Release of Marginals on Small Databases
University of Waterloo, Ontario, Canada Oct, 2013
Purdue University, West Lafayette Sep, 2013

A Polynomial-time Cutting Plane Algorithm for Perfect Matchings
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

A Discrepancy based Approach to Integer Programming

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

Algorithms for Implicit Hitting Set Problems

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

Algorithms for the Lovász Local Lemma

Indian Institute of Technology, Madras	Dec, 2010
Combinatorics Seminar, Georgia Institute of Technology, Atlanta	Sep, 2009

Sampling Star-shaped Bodies

Microsoft Research, Bangalore, India	Jul, 2009
--------------------------------------	-----------

Sampling s-Concave Functions

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

Program Committee Member

– International Symposium on Combinatorial Optimization (ISCO), 2018

Reviewer for conferences

– FOCS (2017, 2016, 2015, 2013, 2010), APPROX (2017), STOC (2017, 2016, 2015, 2011), SODA (2017, 2016, 2015), 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

SERVICE

College of Engineering, UIUC

- College of Engineering Committee (2015–2016): Evaluated the revised CS curriculum and new CS courses
- Library committee (2014–2015)

Department of Industrial and Enterprise Systems Engineering, UIUC

- Graduate Committee (2016–2017)
- Advisory Committee (2016–2017)
- Seminars Committee (2015–2016)
- Grainger Engineering Breakthrough Initiative (GEBI) Hiring Committee (2015–2016)
- ISE-CS Liaison (2014–2015)
- Courses and Curriculum Committee (2014–2015)
- Space Committee (2014–2015)

PhD Defense Committee

- Venkata Gandikota, Computer Science, Purdue, Spring 2017

PhD Preliminary Exam Committee

- Hee Youn Kwon, Industrial Engineering, UIUC, Fall 2017
- Chao Xu, Computer Science, UIUC, Spring 2017
- Shalmoli Gupta, Computer Science, UIUC, Spring 2017
- Vivek Madan, Computer Science, UIUC, Spring 2017
- Siyang Xie, Civil Engineering, UIUC, Spring 2017
- Mayank Baranwal, Mechanical Science and Engineering, UIUC, Fall 2016
- Venkata Gandikota, Computer Science, Purdue, Fall 2015

PhD Qualifiers Committee

- Reza Yousefi Maragheh, ISE, UIUC, Spring 2017
- Runqi Hu, ISE, UIUC, Fall 2015
- Shuanglong Wang, ISE, UIUC, Spring 2015

Other

- Illinois Council of Teachers of Mathematics (ICTM) Math Contest Oral Judge, 2016, 2017

REFERENCES

Available upon request