

# Sudeep Kamath

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## Research Interests

### Information Theory, Learning

My research has made contributions in the discovery of new links between information theory and probability theory, in the theory of learning and estimation from data, and in the information theory of networks.

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## Appointments

- ▷ **Postdoctoral Researcher** [Sept. 2014 - present]  
**Princeton University & Purdue University**  
Center for Science of Information (CSoI)
- ▷ **Postdoctoral Researcher** [Oct. 2013 - Sept. 2014]  
**University of California, San Diego**  
Information Theory and Applications (ITA) Center

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## Education

- 2013 **PhD.** in Electrical Engineering & Computer Sciences  
**University of California, Berkeley**  
*PhD. Thesis:* A study of some problems in network information theory  
*Advisors:* Venkat Anantharam & David N. C. Tse  
*Major GPA:* 4.0/4.0, *UC GPA:* 3.98/4.0
- 2013 **M.A.** in Statistics  
**University of California, Berkeley**
- 2011 **M.S.** in Electrical Engineering & Computer Sciences  
**University of California, Berkeley**
- 2008 **B.Tech.** in Electrical Engineering  
**Indian Institute of Technology, Bombay**  
*CGPA:* 9.91/10.0

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## Awards and Honors

- 2014-16 **Postdoctoral Fellowship**, Center for Science of Information (CSoI)
- 2013-14 **Postdoctoral Fellowship**, Information Theory and Applications (ITA)
- 2013 **Eliahu Jury Award** (best thesis, UC Berkeley). This award is given each year to a graduate student for outstanding achievement in the area of Systems, Communications, Control, or Signal Processing
- 2008 **Institute Silver Medal** (IIT Bombay). Awarded for being *Department Rank 1* (out of around 85 students). Also, *Institute Rank 2* (out of around 500 students) in undergraduate studies at IIT Bombay.
- 2004 Awarded the prestigious **Rajiv Gandhi National Award** as young achiever. This award is given each year for excellence, and to only one person for academic excellence in India

- 2004 **Bronze Medal** at 36<sup>th</sup> International Chemistry Olympiad (IChO), Kiel, Germany
- 2004 **Gold Medal** for outstanding performance throughout the Indian National Physics Olympiad
- 2004 **All India Rank of 22** in the IIT-JEE (joint entrance examination) among over 170,000 students

## Publications

### ► Journal Papers & Preprints

- Manuscript *Entropy rate and Rényi entropy rate estimation for Markov chains*  
Sudeep Kamath, Sergio Verdú  
submitted to International Symposium on Information Theory (ISIT) 2016
- Manuscript *Maximal Leakage Minimization for The Shannon Cipher System*  
Ibrahim Issa, Sudeep Kamath, Aaron Wagner  
submitted to International Symposium on Information Theory (ISIT) 2016
- arXiv: *The two-unicast problem*  
1506.01105 Sudeep Kamath, Venkat Anantharam, David Tse, Chih-Chun Wang  
submitted to the IEEE Transactions on Information Theory
- arXiv: *On Non-Interactive Simulation of Joint Distributions*  
1505.00769 Sudeep Kamath, Venkat Anantharam  
submitted to the IEEE Transactions on Information Theory
- 2014 *Network Capacity Under Traffic Symmetry: Wireline and Wireless Networks*  
(IEEE Trans. Info. Theory) Sudeep Kamath, Sreeram Kannan, Pramod Viswanath  
IEEE Transactions on Information Theory, vol. 60, no. 9, pp. 5457 - 5469, September 2014.
- 2014 *On Distributed Function Computation in Structure-Free Random Wireless Networks*  
(IEEE Trans. Info. Theory) Sudeep Kamath, D. Manjunath, Ravi Mazumdar  
IEEE Transactions on Information Theory, vol. 60, no. 1, pp. 432 - 442, January 2014.
- arXiv: *On Maximal Correlation, Hypercontractivity, and the Data Processing Inequality studied by Erkip and Cover*  
1304.6133 Venkat Anantharam, Amin Aminzadeh Gohari, Sudeep Kamath and Chandra Nair

### ► Conference Papers

- CISS 2016 *Spectral Bounds for Independent Cascade Model with Sensitive Edges*  
Eun Jee Lee, Sudeep Kamath, Emmanuel Abbe, Sanjeev Kulkarni
- CISS 2016 *An Operational Measure of Information Leakage*  
Ibrahim Issa, Sudeep Kamath, Aaron Wagner
- Allerton 2015 *Reverse Hypercontractivity using Information Measures*  
Sudeep Kamath
- COLT 2015 *On learning distributions from their samples*  
Sudeep Kamath, Alon Orlitsky, Dheeraj Pichapati, Ananda Theertha Suresh
- ISIT 2015 *The strong data processing constant for sums of i.i.d. random variables*  
Sudeep Kamath, Chandra Nair
- ISIT 2015 *Delay-constrained unicast and the triangle-cast problem*  
Chandra Chekuri, Sudeep Kamath, Sreeram Kannan, Pramod Viswanath
- Allerton 2014 *Chop and Roll: Improving the Cutset Bound*  
Sudeep Kamath, Young-Han Kim
- ISIT 2014 *On Hypercontractivity and a Data Processing Inequality*  
Venkat Anantharam, Amin Aminzadeh Gohari, Sudeep Kamath, Chandra Nair
- ISIT 2014 *Two-unicast is hard*  
Sudeep Kamath, David N.C. Tse, Chih-Chun Wang

- Allerton 2013 *On Hypercontractivity and the Mutual Information between Boolean Functions*  
Venkat Anantharam, Amin Aminzadeh Gohari, Sudeep Kamath and Chandra Nair
- ISIT 2013 *On the Generalized Network Sharing bound and edge-cut bounds for network coding*  
Sudeep Kamath, David N.C. Tse
- Allerton 2012 *Non-interactive Simulation of Joint Distributions: The Hirschfeld-Gebelein-Rényi Maximal Correlation and the Hypercontractivity Ribbon*  
Sudeep Kamath and Venkat Anantharam
- ISIT 2012 *Wireless Networks Under Symmetric Demands*  
Sudeep Kamath, Sreeram Kannan and Pramod Viswanath
- ISIT 2012 *An information-theoretic meta-theorem on edge-cut bounds*  
Sudeep Kamath and Pramod Viswanath
- ISIT 2011 *Two Unicast Information Flows over Linear Deterministic Networks*  
I-Hsiang Wang, Sudeep Kamath and David N.C. Tse
- ISIT 2011 *The capacity per unit energy of large wireless networks*  
Sudeep Kamath, Urs Niesen and Piyush Gupta
- NetCod 2011 *Generalized Network Sharing outer bound and the Two-Unicast problem*  
Sudeep Kamath, David N.C. Tse and Venkat Anantharam
- Allerton 2010 *A new dual to the Gács-Körner common information defined via the Gray-Wyner system*  
Sudeep Kamath and Venkat Anantharam
- ISIT 2008 *On Distributed Function Computation in Structure-Free Random Networks*  
Sudeep Kamath and D. Manjunath

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## Invited Tutorial Talk

- Jan 2016 **Concentration of Measure, Nexus of Information and Computation Theories**  
Presented a 4-day tutorial on Concentration of Measure at the CIRM school in Marseille, France.

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## Teaching Experience

- Spring 2013 **Graduate Student Instructor for EE 20N, UC Berkeley**  
Responsible for teaching 1-hour weekly discussion sections, 1-hour weekly office hours, and grading exams.

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## Professional Experience

- ▷ Reviewer for ISIT, IEEE Transactions on Information Theory, ITW, ALGO
- ▷ Technical co-chair for ITA 2014
- ▷ Technical Program Committee member for NetCod 2015 and ITW 2015

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## Industry Experience

- Summer 2012 *Jane Street Capital*  
Worked with the Fixed Income desk and the ADR desk to develop and test trading strategies
- Summer 2010 *Alcatel-Lucent Bell Labs*  
Worked on fundamental limits of energy efficiency in wireless networks