

ABISHEK SANKARARAMAN

CONTACT INFORMATION	1626 W.6th St, Unit A Austin, Texas, 78703	Mobile: +1 5126985191 Email: abishek@utexas.edu
INTERESTS	Random Graphs, Stochastic Dynamical Systems, Statistical Machine Learning, Information Theory Application Areas: Social Networks, Wireless Networks	
EDUCATION	The University of Texas at Austin <i>Ph.D. in Electrical and Computer Engineering</i> • Advisor : Prof. François Baccelli Indian Institute of Technology, Madras <i>B.Tech in Electrical Engineering</i> <i>M.Tech in Communication Systems and Signal Processing</i> <i>Minor in Mathematics</i> • Graduated ranked 1 st out of 60 students in the Dual Degree Program	Jan. 2013 - Present 2008 - 2013
HONOURS AND AWARDS	• DAAD, WISE Scholar, 2011. • Top one percent, National Standard Examination in Physics and Chemistry (NSEP) and (NSEC), 2007-08.	
PUBLICATIONS	Interference Queuing Networks on Grids A.Sankararaman, F.Baccelli and S.Foss Under submission Community Detection in Euclidean Random Graphs A.Sankararaman and F.Baccelli In <i>ACM-SIAM Symposium on Discrete Algorithms (SODA)</i> , January 2018. (To Appear) Spatial Birth-Death Wireless Networks A.Sankararaman and F.Baccelli In <i>IEEE Transactions on Information Theory</i> , June 2017. Preliminary Version in <i>54th Allerton Conference</i> , October 2016. Performance-Oriented Association in Large Cellular Networks with Technology Diversity A.Sankararaman, J.woo Cho and F.Baccelli In <i>28th International Teletraffic Congress (ITC 28)</i> , September 2016. CSMA k-SIC : A class of distributed MAC protocols and their performance evaluation A.Sankararaman and F.Baccelli In <i>IEEE INFOCOM 2015</i> , April 2015.	
WORK EXPERIENCE	Wireless Networking and Communications Group (WNCG), UT Austin Graduate Research Assistant. Advisor: Prof. François Baccelli	Austin, TX Jan 2014-Present
	Simons Center for Network Mathematics Graduate Research Assistant. Advisor: Prof. François Baccelli	Austin, TX. Jan 2014-Present
	Huawei Research Labs Data Science Intern	Santa-Clara, CA. May - Aug, 2015.
RESEARCH PROJECTS	Community Detection on Spatial Graphs • Formulated a mathematical model of a planted community spatial random graph. • Developed novel algorithm for partitioning the nodes of a spatial graph to reveal embedded communities. • Established performance analysis of our algorithm using ideas from dependent percolation. • Established an information-theoretic lower bound using coupling arguments. Furthermore, the lower bound matched the upper bound by our algorithm in certain important special cases. • The details can be found in the paper - <i>Community Detection on Euclidean Random Graphs</i> .	(June, 2016 - Present)

Interference Networks on the Continuum and Grids

(Aug-2014 - Present)

- Proposed a novel ‘interacting queuing model’. This model was intended to capture the coupling between space and time in wireless networks. Specifically, when a wireless link access the spectrum, it causes interference to other nearby links, and hence their rate of communication is lowered. This in turn implies they access the spectrum longer and cause more interference to other nearby links for a larger duration.
- We model this phenomenon both in continuum space as well as discrete grids. In both cases, we establish sharp *phase-transitions*. The highlight of the results is when we established a sharp phase-transition for the infinite version of this problem (see the paper “Interference Queuing Networks on Grids” for details). The results are of significance both to mathematics and to practical operation of networks.
- The details can be found in the following two papers - *Spatial Birth-Death Wireless Networks* and *Interference Queuing Networks on Grids*.

Data Analytics for Cell-Phone Data

(May,2015 - Aug,2015)

Huawei Research Labs, Santa-Clara, CA

- Worked with the data-science team to build a pipe-line for analyzing cell phone call logs of users.
- Built and executed Community Detection algorithms on the call and text graph on Apache Spark.
- The Community Detection output was used later as one of the features in a Churn Prediction Machine Learning model developed by the team.
- Mentor: [Hui Zang](#)

TEACHING
EXPERIENCE

Teaching Assistant, Statistical Signal Processing
University of Texas at Austin

Spring 2014

GRADUATE
COURSEWORK

- **Electrical Engineering and Computer Science** Probability and Statistics, Advanced Probability - Learning and Inference, Data Structures and Algorithms, Large Scale Optimization Algorithms, Randomized Algorithms, Machine Learning.
- **Mathematics:** Linear Algebra, Abstract Algebra, Real Analysis, Measure theoretic probability, Stochastic Processes - I and II, Markov Chains and Mixing, Stochastic Geometry, Random Graphs, Dynamical Systems.

TECHNICAL
SKILLS

- **Programming Languages:** Python, C++, MATLAB.

ONLINE PRESENCE

- [Research Webpage](#)
- [Github](#)