

# SURAJ JOG

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## EDUCATION

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- University of Illinois at Urbana-Champaign** Aug 2016 - Present  
*Ph.D. Candidate in Electrical & Computer Engineering*  
*Overall GPA: 4.0/4.0*  
*Advisor : Prof. Haitham Hassanieh*
- Indian Institute of Technology, Bombay** Jul 2012 - May 2016  
*Bachelor of Technology (with Honors) in Electrical Engineering*  
*Overall GPA: 9.32/10*

## RESEARCH INTERESTS

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Wireless Networking and RF systems, Mobile Sensing, and Machine Learning

## AWARDS AND HONORS

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- SIGCOMM'18 Student Research Competition (SRC) Winner - First Place 2018
- SIGCOMM'18 Student Travel Grant 2018
- ECE Rambus Fellowship at UIUC 2018 -19
- Qualified to second stage of Qualcomm Innovation Fellowship 2018
- Cargill Global Scholarship 2014 -16
- All India Rank 24 in IIT Joint Entrance Exam (top 0.005% in India) 2012

## PUBLICATIONS AND POSTERS

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Sharing within limits: Partial resource pooling in loss systems (*Under Review*)  
Anvitha Nandigam, **Suraj Jog**, D. Manjunath, Jayakrishnan Nair, Balakrishna Prabhu

An Experimental Study of the Treewidth of Real-World Graph Data  
Silviu Maniu, Pierre Senellart, **Suraj Jog**  
*BDA: Data Management - Principles, Technologies and Applications 2018*

*Poster:* Enabling Dense Spatial Reuse in mmWave Networks  
**Suraj Jog**, Jiaming Wang, Haitham Hassanieh, Romit Roy Choudhury  
*SIGCOMM 2018, Winner: Student Research Competition (SRC)*

*Poster:* Multi-User Wireless Virtual Reality with Millimeter Wave Networks  
**Suraj Jog**, Anadi Chaman, Haitham Hassanieh  
*NSF Millimeter-Wave RCN Workshop 2017*

## WORK EXPERIENCE

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**FarmBeats: AI and IoT platform for data driven agriculture** Summer 2018  
*Microsoft Research, Redmond | Dr. Ranveer Chandra*

- **Project 1: Networking for Long-Range IoT radios**  
Designed intelligent cross-layer MAC and channel selection protocols for low-power IoT radios over the TV White spaces to enable a scalable networking solution for sensors deployed in farms.
- **Project 2: LoRa for RF Sensing**  
Designed a low-cost RF-based wind sensor, that reduces cost from 100 USD to less than 2 USD. Presented a working prototype to Microsoft CTO Kevin Scott during his visit to our farm.
- FarmBeats was listed as one of the ten projects that inspired Satya Nadella, and is one of the flagship projects for Microsoft AI for Earth.

*Siemens, India | Dr. Amit Kale*

- Designed a metric learning framework using Supervised Random Forests integrated with WTA-Hash, in order to quantify the similarity between two images under noisy conditions
- Achieved reduction in False Positive Rate from 3.5 % to 0.4 % (at 95 % True Positive Rate) for the task of classifying images as similar or dissimilar in standard image datasets

## RESEARCH PROJECTS

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**Multipath Aware Geometric Routing in mmWave WLAN networks** Aug 2016 - Jan 2018  
*UIUC | Prof. Haitham Hassanieh*

- Designed a mmWave MAC protocol that exploits multipath to maximize spatial reuse by geometrically routing wireless signals at the physical layer with minimal control overhead
- Deployed a testbed to demonstrate  $\sim 6\times$  throughput gain over the 802.11ad WiFi standard, with each client maintaining an average data rate of 3.8 Gbps

**Sublinear-Time mmWave Imaging for Autonomous Vehicles** Oct 2017 - Present  
*UIUC | Prof. Haitham Hassanieh*

- Designed a practical and fast imaging algorithm for mmWave radars in self driving cars, that uses multi-armed antenna beam patterns to exploit the sparsity of mmWave reflections in 3D space
- Deployed a preliminary testbed to demonstrate the ability of our system to produce high quality images in low visibility conditions (like fog), where sensors like LiDARs and cameras fail

**Partial Resource Pooling in Loss Systems** Dec 2015 - Nov 2017  
*IIT Bombay | Prof. D. Manjunath & Prof. Jayakrishnan Nair*

- Proposed a resource sharing model for a two player system that guarantees performance gains for both participating entities through partial resource pooling
- Derived theoretical proofs to show that the Pareto frontier is a non-empty set and that it lies at the boundary of all possible sharing configurations

## ACTIVITIES AND SERVICES

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### Web Chair

*mmNets 2017, 1st ACM Workshop on Millimeter-Wave Networks and Sensing Systems*  
 Snowbird, Utah, Oct 2017

### Student Organizer

*Techfest 2013, Annual Science and Technology Festival, IIT Bombay*  
 Mumbai, India, Dec 2013

## TEACHING EXPERIENCE

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TA, ECE 598HH: Wireless Networks and Mobile Systems (UIUC)	Spring 2018
TA, ECE 438: Communication Networks (UIUC)	Fall 2017
TA, PH 103: Electricity and Magnetism (IIT Bombay)	Fall 2014 & Fall 2015

## EXTRA-CURRICULAR ACTIVITIES

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- Secured First Position in Oman National-Level Chess Tournament (Junior Category)
- Top 40 contestants from Mumbai in Indian Idol 2012 (Singing Reality Competition)
- Elected as *Institute Cultural Mentor for Music 2013-14*, to mentor a batch of 880 freshmen