

Sanjib Sur

Contact Details

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🌐: <https://cse.sc.edu/~sur>

Research Interests

Wireless Systems and Architectures, Millimeter-Wave Communications and Networks, Internet of Things (IoT) Connectivity and Sensing Systems.

Education

University of Wisconsin–Madison, WI, USA Fall 2013 – Summer 2018

Ph.D. in Electrical and Computer Engineering

Nominated for the Wisconsin Distinguished Graduate Fellowship for *Outstanding Graduate Work*

- Thesis: Scalable and Ubiquitous Millimeter-Wave Networks and Applications
- Advisor: Xinyu Zhang

Bengal Engineering and Science University, WB, India Fall 2007 – Spring 2011

Bachelor of Engineering in Computer Science and Engineering

Recipient of the **President of India Gold Medal** for *Outstanding Academic Achievement*

- Thesis: Error Free Deployment and Enhanced Security Strategies in Wireless Sensor Networks
- Advisor: Sipra Das Bit

Employment

University of South Carolina, SC Fall 2018 – Present

Assistant Professor

University of Wisconsin–Madison, WI Fall 2013 – Summer 2018

Graduate Research Assistant

Hewlett Packard Labs, Palo Alto, CA Summer 2015 – Fall 2017

Research Associate in the IoT & Edge Lab

Texas Instruments Summer 2011 – Summer 2013

Design Engineer in the Open Multimedia Applications Platform Group

Texas Instruments, Bangalore, India Summer 2010

Software Engineering Intern in the HD Video Engineering Group

Honors and Awards

Best Poster Award, ACM HotMobile 2021

For early work on visual map and machine learning aided 5G picocell placement

Best Poster Runner-up Award, ACM HotMobile 2021

For early work on machine learning augmented hand-held millimeter-wave imaging

ASPIRE II Award, University of South Carolina 2020

For in-home mobility impairment assessment research

Travel Grant Award for NSF CSR-NeTS PI Workshop 2019

PI for NSF CNS Core grant

Nominated by the ECE department for the Wisconsin Distinguished Graduate Fellowship <i>For outstanding graduate work</i>	2017
President of India Gold Medal , Bengal Engineering and Science University <i>For outstanding academic achievement</i>	2012
University Silver Medal , Bengal Engineering and Science University <i>Ranked 1st in academic department</i>	2011
Student Travel Grant Award	
• ACM MobiCom	2016
• USENIX NSDI	2016
• ACM MobiSys	2014

Extramural Grants

- NSF MRI, Co-PI,** 10/2020 - 09/2023
 – *Project title:* “MRI: Acquisition of Omniperceptive Chamber for Gathering Ground Truth and Enabling Research on Smart and Connected Things”
 – *PI:* Prof. Srihari Nelakuditi, University of South Carolina; *Co-PI:* Prof. Stacy Fritz, University of South Carolina;
Co-PI: Prof. Nikolaos Vitzilaios, University of South Carolina; *Co-PI:* Prof. Guoan Wang, University of South Carolina;
 – Award amount: \$714,286
- NSF CNS Core, PI,** 10/2019 – 09/2022
 – *Project title:* “CNS Core: Small: Software-Hardware Reconfigurable Systems for Mobile Millimeter-Wave Networks”
 – *Co-PI:* Prof. Srihari Nelakuditi, University of South Carolina; *Co-PI:* Prof. Guoan Wang, University of South Carolina
 – Award amount: \$515,967
- Texas Instruments Equipment Grant** 08/2018
 – Award amount: \$3,990

Intramural Grants

- Magellan Undergraduate Research Grant, PI,** 01/2021 – 05/2021
 – *Project title:* “Visual Data Augmented 5G Millimeter-Wave Picocell Placement”
 – *Undergraduate student:* Timothy Dayne Hooks
 – Award amount: \$2,500
- ASPIRE II, PI,** 07/2020 – 06/2022
 – *Project title:* “In-Home Mobility Impairment Assessment and Feedback using 5G Wireless Signals and Voice-Assistants”
 – *Co-PI:* Prof. Stacy Fritz, University of South Carolina; *Co-PI:* Prof. J Benjamin Jackson, University of South Carolina;
Co-PI: Prof. Souvik Sen, University of South Carolina; *Co-PI:* Prof. Srihari Nelakuditi, University of South Carolina;
 – Award amount: \$99,707

Research Supervision

Ph.D. Students

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|------------------------------------------------------|-----------------------|
| 1. Pingping Cai, University of South Carolina | Spring 2021 – Present |
| 2. Aakriti Adhikari, University of South Carolina | Fall 2020 – Present |
| 3. Hem Regmi, University of South Carolina | Fall 2020 – Present |
| 4. Austin Hetherington, University of South Carolina | Fall 2020 – Present |

5. Moh Sabbir Saadat, University of South Carolina Spring 2019 – Present

M.S. Students

1. Heiru Wu, University of South Carolina Fall 2018
2. Long He, University of South Carolina Fall 2018

Undergraduate Students

1. Stephen Baione, University of South Carolina Spring 2021 – Present
2. Edward Sitar, University of South Carolina Spring 2021 – Present
3. Jackie Schellberg, University of South Carolina Spring 2021 – Present
4. Ian McDowell, University of South Carolina Spring 2021 – Present
5. Lance Kevin, University of South Carolina Fall 2020 – Present
6. Ian Urton, University of South Carolina Fall 2020
7. Timothy Dayne Hooks, University of South Carolina Fall 2020 – Present
8. Austin Hetherington, University of South Carolina Summer 2020
9. Austin Staton, University of South Carolina Fall 2018
10. Chuanyi Zhang, Undergraduate intern, University of Wisconsin–Madison Summer 2016
11. Ran Xu, Undergraduate intern, University of Wisconsin–Madison Summer 2015

Teaching Experience

Course Instructor

1. CSCE 313: Embedded Systems
 - Instructor for a course on fundamentals of embedded systems: hardware and software components, interface design, and co-design.
Spring 2020
2. CSCE 416: Introduction to Computer Networks
 - Instructor for a course on introduction to fundamental concepts in the design and implementation of computer networks, their protocols, and applications.
Fall 2020, Fall 2019
3. CSCE 790: Topics in Information Technology
 - Wireless and Mobile Systems for the IoT: Instructor for a special topics course on state-of-the-art systems' research on the Internet of Things (IoT).
Spring 2020, 2021
 - Millimeter-Wave Networking and Application: Designed a new special topics course on introduction to the state-of-the-art in millimeter-wave networking and applications.
Fall 2018
4. CSCE 791: Seminar in Advances in Computing
 - Instructor for a course on technical writing and presentations in major computing research areas.
Fall 2020

Guest Lecturer

1. CSCE 791: Seminar in Advances in Computing, University of South Carolina
 - Towards Scalable and Ubiquitous Millimeter-Wave Wireless Networks Fall 2018
 - Towards Scalable and Ubiquitous Millimeter-Wave Networks and Applications Spring 2019
2. ELCT 861: Advances in Electromagnetics, University of South Carolina
 - Pushing the Limits of Hand-held Millimeter-Wave Imaging Spring 2021

Teaching Assistant

1. ECE 454: Mobile Computing Laboratory, University of Wisconsin–Madison

Fall 2016

Committee Members

Ph.D. Thesis Defense

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|-----------------------------------------------------------|-------------|
| 1. Phani Krishna Penumarthy, University of South Carolina | Summer 2020 |
| 2. Nozhan Hosseini, University of South Carolina | Summer 2020 |
| 3. Jinwen Liu, University of South Carolina | Spring 2020 |

Ph.D. Proposal Defense

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|-----------------------------------------------------------|-------------|
| 1. Phani Krishna Penumarthy, University of South Carolina | Spring 2019 |
| 2. Jinwen Liu, University of South Carolina | Fall 2019 |
| 3. Nozhan Hosseini, University of South Carolina | Fall 2019 |

Conference Publications

Underlined are my direct advisees. Updated information available at <https://cse.sc.edu/~sur/publications.html>

1. A Case for Temperature-Aware Scheduler for Millimeter-Wave Devices and Networks
Moh Sabbir Saadat, **Sanjib Sur**, Srihari Nelakuditi
IEEE International Conference on Network Protocols (ICNP), 2020
2. MilliCam: Hand-held Millimeter-Wave Imaging
Moh Sabbir Saadat, **Sanjib Sur**, Srihari Nelakuditi, Parmesh Ramanathan
Invited paper at IEEE International Conference on Computer Communications and Networks (ICCCN), 2020
3. Practical Privacy Protection for Audio Sensing Against Multi-Microphone Adversaries
Chuhan Gao, Kassem Fawaz, **Sanjib Sur**, Suman Banerjee
The 19th Privacy Enhancing Technologies Symposium (PETS), 2019
4. Towards Scalable and Ubiquitous Millimeter-Wave Wireless Networks
Sanjib Sur, Ioannis Pefkianakis, Xinyu Zhang, Kyu-Han Kim
ACM International Conference on Mobile Computing and Networking (MobiCom), 2018
(42 out of 187 submissions, acceptance ratio: 22%)
5. WiFi-Assisted 60 GHz Wireless Networks
Sanjib Sur, Ioannis Pefkianakis, Xinyu Zhang, Kyu-Han Kim
ACM International Conference on Mobile Computing and Networking (MobiCom), 2017
(35 out of 186 submissions, acceptance ratio: 18.8%)
6. Practical MU-MIMO User Selection on 802.11ac Commodity Networks
Sanjib Sur, Ioannis Pefkianakis, Xinyu Zhang, Kyu-Han Kim
ACM International Conference on Mobile Computing and Networking (MobiCom), 2016
(31 out of 226 submissions, acceptance ratio: 14%)
7. Scoping Environment for Robust 60 GHz Link Deployment
Sanjib Sur, Xinyu Zhang
Invited paper at Information Theory and Applications (ITA), 2016
8. BeamSpy: Enabling Robust 60 GHz Links Under Blockage
Sanjib Sur, Xinyu Zhang, Parameswaran Ramanathan, Ranveer Chandra
USENIX Symposium on Networked Systems Design and Implementation (NSDI), 2016
(45 out of 225 submissions, acceptance ratio: 20%)
9. 60 GHz Indoor Networking through Flexible Beams: A Link-Level Profiling
Sanjib Sur, Vignesh Venkateswaran, Xinyu Zhang, Parameswaran Ramanathan
ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS), 2015
(32 out of 239 submissions, acceptance ratio: 13.4%)

10. Bringing Multi-Antenna Gain to Energy-Constrained Wireless Devices
Sanjib Sur, Teng Wei, Xinyu Zhang
IEEE/ACM International Conference on Information Processing in Sensor Networks (IPSN), 2015
 (27 out of 111 submissions, acceptance ratio: 24.3%)
11. Bridging Link Power Asymmetry in Mobile Whitespace Networks
Sanjib Sur, Xinyu Zhang
IEEE International Conference on Computer Communications (INFOCOM), 2015
 (316 out of 1640 submissions, acceptance ratio: 19.2%)
12. Autodirective Audio Capturing Through a Synchronized Smartphone Array
Sanjib Sur, Teng Wei, Xinyu Zhang
ACM International Conference on Mobile Systems, Applications, and Services (MobiSys), 2014
 (25 out of 185 submissions, acceptance ratio: 13.5%)
13. μ Sec: A Security Protocol for Unicast Communication in Wireless Sensor Networks
 Amrita Ghosal, **Sanjib Sur**, Sipra Das Bit
International Workshop on Autonomous and Spontaneous Security, 2012
14. Handwritten Bangla Character Recognition in Machine-Printed Forms Using Gradient Information and Haar Wavelet
 Sekhar Mandal, **Sanjib Sur**, Avishek Dan, Partha Bhowmick
IEEE International Conference on Image Information Processing (ICIIP), 2011
 (148 out of 624 submissions, acceptance ratio: 23%)
15. Ensuring Basic Security and Preventing Replay Attack in a Query Processing Application Domain in WSN
 Amrita Ghosal, Subir Halder, **Sanjib Sur**, Avishek Dan, Sipra Das Bit
International Conference on Computational Science and Its Applications, 2010
16. A Lifetime Enhancing Node Deployment Strategy in WSN
 Subir Halder, Amrita Ghosal, **Sanjib Sur**, Avishek Dan, Sipra Das Bit
International Conference on Future Generation Information Technology, 2009

Posters

1. VisualMM: Visual Data & Learning Aided 5G Picocell Placement
 Timothy Dayne Hooks, Hem Regmi, **Sanjib Sur**
ACM International Workshop on Mobile Computing Systems and Applications (HotMobile), 2021
 (**Best Poster Award**)
2. ZigZagCam: Pushing the Limits of Hand-held Millimeter-Wave Imaging
 Hem Regmi, Moh Sabbir Saadat, **Sanjib Sur**, Srihari Nelakuditi
ACM International Workshop on Mobile Computing Systems and Applications (HotMobile), 2021
 (**Best Poster Runner-up Award**)
3. SpiroMilli: Bringing Ad-hoc Spirometry to 5G Devices
 Aakriti Adhikari, Austin Hetherington, **Sanjib Sur**
ACM International Workshop on Mobile Computing Systems and Applications (HotMobile), 2021
4. Bringing Temperature-Awareness to Millimeter-Wave Networks
 Moh Sabbir Saadat, **Sanjib Sur**, Srihari Nelakuditi
ACM International Conference on Mobile Computing and Networking (MobiCom), 2020
5. Towards WiFi-Assisted Millimeter-Wave Enterprise Wireless Networks
Sanjib Sur, Ioannis Pefkianakis, Kyu-Han Kim
Hewlett Packard Enterprise Technical Conference, 2017
6. MU-MIMO User Selection and Rate Adaptation for 802.11ac-based Enterprise Wi-Fi Networks
Sanjib Sur, Ioannis Pefkianakis
Hewlett Packard Enterprise Technical Conference, 2016
 (**Honorable Mention**)

7. Scoping Environment to Assist 60 GHz Link Deployment

Sanjib Sur, Xinyu Zhang

ACM International Conference on Mobile Computing and Networking (MobiCom), 2015

Demo

1. WiFi-Assisted 60 GHz Wireless Networks

Sanjib Sur, Ioannis Pefkianakis, Xinyu Zhang, Kyu-Han Kim

ACM International Conference on Mobile Computing and Networking (MobiCom), 2017

Patents

Granted

1. US Patent 10,820,242, Reroute Network Traffic From Millimeter-Wave Link to WLAN Transmission, Sanjib Sur, Ioannis Pefkianakis, Granted on Oct. 2020
2. US Patent 10,587,353, MU-MIMO Group Assignment, Sanjib Sur, Ioannis Pefkianakis, Souvik Sen, Granted on Mar. 2020
3. US Patent 10,548,147, Access Point Beam Strength Rankings, Sanjib Sur, Ioannis Pefkianakis, Granted on Jan. 2020
4. US Patent 10,505,619, Selecting Beams Based on Channel Measurements, Sanjib Sur, Ioannis Pefkianakis, Granted on Dec. 2019
5. US Patent 10,171,140, MU-MIMO Group Selection, Sanjib Sur, Ioannis Pefkianakis, Granted on Jan. 2019
6. US Patent 10,051,685, Adapting Radios of Millimeter-Wave Devices, Sanjib Sur, Ioannis Pefkianakis, Granted on Aug. 2018
7. US Patent 9,577,731, Radio Frequency Communication with Antenna Index Coding, Xinyu Zhang, Sanjib Sur, Teng Wei, Granted on Feb. 2017

Pending

8. US Patent Application 63/055,386, Heat Dissipation for Millimeter-Wave Devices with Antenna Switching, Sanjib Sur, Moh Sabbir Saadat, Srihari Nelakuditi, Filed on July 2020
9. US Patent Application 63/025,333, Methods and Integrated Structures of Heat Dissipation for Microwave Antennas, Guoan Wang, Jinqun Ge, Sanjib Sur, Srihari Nelakuditi, Filed on May 2020
10. US Patent Application 62/924,436, A Reconfigurable Antenna Design for Centimeter-Wave and Millimeter-Wave, Sanjib Sur, Guoan Wang, Srihari Nelakuditi, Filed on Oct. 2019
11. US Patent Application 62/753,293, In-field Gait Parameters Estimation, Sanjib Sur, Filed on Oct. 2018
12. US Patent Application PCT/US2015/062759, Access Point Selection, Ioannis Pefkianakis, Sanjib Sur, Yunze Zhang, Filed on Nov. 2015

Trademarks

Pending

1. US Trademark Application Serial Number 90085316, AQUILO: Heat Dissipation Systems for Antennae, Sanjib Sur, Filed on Jul. 2020

Professional Services

TPC co-chair for ACM mmNets Workshop	2020
Proposal Reviewer for ASPIRE II, USC	2021
NSF Reviewer	2021
Member of the Technical Program Committees	

• IEEE ICDCS	2021
• IEEE WoWMoM	2021
• IEEE IFIP Networking	2021
• IEEE World Symposium on Communication Engineering	2019
• ACM Millimeter-Wave Networks and Sensing Systems Workshop	2019
• ACM Wireless Network Testbeds, Experimental evaluation & CHaracterization Workshop	2019, 2020
• ACM S3 Workshop	2017
Member of the Organization Committees	
• IEEE STEERS: Serverless To sErVE moRE at Scale Workshop	2021
• NSF mmWave RCN Workshop	2020
Member of the Editorial Board	
• Elsevier High-Confidence Computing	2021
Panelist	
• ACM MobiCom S3 Workshop	2018
Served as the Head judge for the Math and Computer Science Senior Division projects at the USC Science and Engineering Fair	2020
Served on the USC CSE Faculty Search Committee	2019
Serving on the CSE Graduate Admissions and Fellowships Committee	2018 – Present
• Director of the CSE Graduate Admissions Sub-committee	
Reviewer for book proposal at Springer Nature	2018
Reviewer of Journals	
• IEEE Transactions on Mobile Computing	2015 – 2021
• IEEE/ACM Transactions on Networking	2016 – 2021
• IEEE Transactions on Communications	2016 – 2020
• IEEE Transactions on Wireless Communications	2020
• IEEE Transactions on Vehicular Technology	2017
• IEEE Transactions on Network and Service Management	2018
• IEEE Transactions on Dependable and Secure Computing	2018
• IEEE Wireless Communications Letters	2018
• IEEE Transactions on Network Science and Engineering	2018
• IEEE Systems	2018 – 2021
• Wiley Transactions on Emerging Telecommunications Technologies	2020
• ACM Transactions on Sensor Networks	2018 – 2020
• Elsevier Pervasive and Mobile Computing	2018
• EURASIP Journal on Wireless Communications and Networking	2018
• IEEE Access	2019 – 2021
• IEEE Journal on Selected Areas in Communications	2019
• PLOS One	2021
• MDPI Open Access – Energies, Applied Sciences, Information	2019 – 2021