BHUVANA KRISHNASWAMY
Madison,WI

Email: bhuvana@ece.wisc.edu
https://uwconnect.ece.wisc.edu/

WORK EXPERIENCE

University of Wisconsin-Madison Electrical and Computer Engineering
Associate Professor,   Fall 2025 - Present
Assistant Professor,   Fall 2018 - Summer 2025
Cisco Systems, San Jose, CA   Summer 2016
Research Intern
Cable Labs, Louisville, CO   Summer 2015
Research Intern
Nokia Research, Berkeley, CA   Summer 2014
Research Intern
Georgia Institute of Technology   Fall 2011-Spring 2018
Graduate Research Assistant

EDUCATION

Ph.D in Electrical and Computer Engineering   Spring 2013-Summer 2018
Advisor: Dr. Raghupathy Sivakumar   Georgia Institute of Technology, Atlanta
Thesis : Algorithms for molecular communication networks

Masters in Electrical and Computer Engineering   Fall 2011-Fall 2013
Advisor: Dr. Raghupathy Sivakumar   Georgia Institute of Technology, Atlanta

Bachelors of Electronics and Communication Engineering   Fall 2007-Spring 2011
College of Engineering, Guindy, Chennai, India

AWARDS AND HONORS

Recognitions for the Impact and Service to the Community

- Early Career Innovator Award, UW-Madison 2023

- Wisconsin Hilldale Undergraduate/Faculty Research Fellowship, UW-Madison 2023-2024

- Finalist in Wisconsin Alumni Research Foundation (WARF) Innovation Award 2019 and 2020

- Outstanding program committee member award, MobiCom 2022

Recognitions for Research Contributions

- IEEE Senior Member 2024

- Charles Ringrose Assistant Professor 2023 - 2026

- National Science Foundation CAREER Award 2022

- N2Women Rising Star 2022

Recognitions for Teaching Activities

- Honored Instructor 2022

- Madison Teaching and Learning Excellence (MTLE) fellow

SELECT PUBLICATIONS AT UW-MADISON

* underlining indicates graduate students of Prof. Krishnaswamy.

1. Jacqueline Schellberg, Suraj Jog, Vaishnavi Ranganathan, Krishna Chintalapudi, Bodhi Priyantha, **Bhuvana Krishnaswamy**, "Mirror in the Sky: Democratizing Continent-Scale IoT Connectivity via Amateur Satellites" accepted for publication in HotMobile 2026, Atlanta, USA.

2. Yoganand Biradavolu, Jian Ding, Vaishnavi Ranganathan, Leandros Tassiulas, **Bhuvana Krishnaswamy**, "EC-Sense: Radio Energy Capture for Ultra-Low-Power Wireless Soil Moisture Sensing" to be published *in the proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, December 2025 (IMWUT 2025)*

3. Jiaming Wang, Samin Beheshti Zavareh, Haitham Hassanieh, **Bhuvana Krishnaswamy**, "Heartbeat Aware Decoding in Molecular Networks," in IEEE INFOCOM 2025. London, United Kingdom, 2025, pp. 1-10, doi: 10.1109/INFOCOM55648.2025.11044658.

4. Sarah Tanveer, Olivia D'Souza, **Bhuvana Krishnaswamy**, Ali Abedi, Daniel Sheen, Samuel Thé , Frank Lind, Mary Knapp "Tracking the Unseen: Identifying LEO Satellite Interference for Radio Astronomy", Poster presented at the 9th Annual Small Satellite Conference (SmallSat) at Salt Lake City, August 10-13, 2025.

5. Muhammad Osama Shahid and **Bhuvana Krishnaswamy**. "BYOG : Multi-Channel, real-time LoRaWAN Gateway testbed using general-purpose Software Defined Radio." *in the proceedings of the ACM on Networking 2024 (CoNEXT 2024)*

6. Muhammad Osama Shahid, Daniel Koch, Jayaram Raghuram, Krishna Chintalapudi, Suman Banerjee, and **Bhuvana Krishnaswamy**. "Cloud-LoRa: Enabling Cloud Radio Access LoRa Networks Using Reinforcement Learning Based Bandwidth-Adaptive Compression." *in the proceedings of USENIX Symposium on Networked Systems Design and Implementation, pp. 1959-1976 2024. (NSDI 2024)*

7. Dajun Zhang, Akhil Polamarasetty, Muhammad Osama Shahid, **Bhuvana Krishnaswamy**, and Chu Ma. "Metamaterial-based passive analog processor for wireless vibration sensing." in *Communications Engineering 3, no. 1 (2024): 44.*

8. Jiaming Wang, Sevda Öğüt, Haitham Al Hassanieh, **Bhuvana Krishnaswamy**. "Towards Practical and Scalable Molecular Networks." *in the proceedings of the ACM SIGCOMM 2023, pp. 62-76 2023.*

9. Yaman Sangar, Kai Pederson, Yoganand Biradavolu, Vaishnavi Ranganathan, and **Bhuvana Krishnaswamy.** "PACT : Scalable, Long-Range Communication for Monitoring and Tracking Systems Using Battery-less Tags" *in the proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 6, no. 4 (2023): 1-27. (IMWUT 2023)*

10. Ian Petersen, Amy Cao, Anna Goforth, Anna Vena, Megan N. McClean, Benjamin Walker, **Bhuvana Krishnaswamy**. "Microfluidic Chip for Biosensing Yeast Cells" *in the proceedings of the*

ACM International Conference on Nanoscale Computing and Communication, pp. 1-2 2022. (NanoCom 2022)

11. Daniel Koch, Muhammad Osama Shahid, **Bhuvana Krishnaswamy.** "Spreading Factor Detection for low-cost Adaptive Data Rate in LoRaWAN Gateways" *in the proceedings of the 20th ACM Conference on Embedded Networked Sensor Systems, pp. 918-924 2022. (ENSys, co-located with Sensys 2022)*

12. Yaman Sangar, Yoganand Biradavolu, and **Bhuvana Krishnaswamy.** "A novel time-interval based modulation for large-scale, low-power, wide-area-networks" *in the proceedings of the ACM Transactions on Sensor Networks 18, no. 4 (2022), pp. 1-30. (TSON 2022)*

13. Hendri Winanto, Jingyi Huang, **Bhuvana Krishnaswamy**, Francisco J Arriaga, Christian U Martinez, Kevin Guenthner, Olivia D'Souza, Adam Nygard. "A Low-cost Low-power Wireless Sensor Network for Soil CO2 Emission Monitoring over Fine Spatial and Temporal Scales", In AGU (American Geophysical Union) Fall Meeting Abstracts (Vol. 2022, pp. GC42C-0718), December 2022.

14. Muhammad Osama Shahid, Millan Philipose, Krishna Chintalapudi, Suman Banerjee, and **Bhuvana Krishnaswamy**. "Concurrent Interference Cancellation: Decoding Multi-packet Collisions in LoRa" *in the proceedings of the ACM SIGCOMM 2021, pp. 503-515 2021.*

15. Yaman Sangar and **Bhuvana Krishnaswamy.** "WiChronos : Energy-Efficient Modulation for Long-Range, Large-Scale Wireless Networks" *Poster presented at the Low-power Design Contest at ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED 2021)*

16. **Bhuvana Krishnaswamy** and Megan McClean. "Shining Light on Molecular Communication" *in the proceedings of the ACM International Conference on Nanoscale Computing and Communication, pp. 1-7. 2020. (NanoCom 2020)*

17. Yaman Sangar and **Bhuvana Krishnaswamy**. "WiChronos : Energy-Efficient Modulation for Long-Range, Large-Scale Wireless Networks", *in the proceedings of the Annual International Conference on Mobile Computing and Networking , pp. 1-14. 2020 (MobiCom 2020)*

18. Yaman Sangar and **Bhuvana Krishnaswamy**. "Poster: Time Encoding for Energy Efficiency and Scalability in Wireless Networks" *in the proceedings of the workshop on Wireless of the Students, by the Students, and for the Students, pp. 15-15 2019 (co-located with MobiCom 2019)*

19. Yaman Sangar and **Bhuvana Krishnaswamy**. "Link Layer Protocol for Molecular Communication Networks published" *in the proceedings of the ACM International Conference on Nanoscale Computing and Communication, pp. 1-6 2019 (NanoCom 2019)*

20. **Bhuvana Krishnaswamy** and Raghupathy Sivakumar. "Amplitude-Width Encoding for Error Correction in Bacterial Communication Networks" *in the proceedings of the ACM International Conference on Nanoscale Computing and Communication, pp. 1-7 2018 (NanoCom 2018)*

21. Chao-Fang Shih, **Bhuvana Krishnaswamy**, Yubing Jian, and Raghupathy Sivakuma. "Scheduled WiFi using distributed contention in WLANs: algorithms, experiments, and case-studies." in Wireless Networks 24 (2018): 89-112

22. Yubing Jian, **Bhuvana Krishnaswamy**, Caitlin M. Austin, A. Ozan Bicen, Arash Einolghozati,

Jorge E. Perdomo, Sagar C. Patel et al. "nanoNS3: A network simulator for bacterial nanonetworks based on molecular communication. *in Nano Communication Networks 12 (2017): 1-11.*

23. **Bhvuana Krishnaswamy**, Yubing Jian, Caitlin M. Austin, Jorge E. Perdomo, Sagar C. Patel, Brian K. Hammer, Craig R. Forest, and Raghupathy Sivakumar. "ADMA: Amplitude-division multiple access for bacterial communication networks." *in IEEE Transactions on Molecular, Biological and Multi-Scale Communications, 3(3), pp.134-149, 2017*

24. **Bhuvana Krishnaswamy** and Raghupathy Sivakumar. "Advanced Receiver Designs for Bacterial Communication with Amplitude Source Addressing. *in the proceedings of the ACM International Conference on Nanoscale Computing and Communication, pp. 1-2 2016 (NanoCom 2016)*

25. Yubing Jian, **Bhuvana Krishnaswamy**, Caitlin M. Austin, A. Ozan Bicen, Jorge E. Perdomo, Sagar C. Patel, Ian F. Akyildiz, Craig R. Forest, and Raghupathy Sivakumar. "nanoNS3: Simulating bacterial molecular communication based nanonetworks in Network Simulator 3" *in the proceedings of ACM International Conference on Nanoscale Computing and Communication, pp.1-7 2016 (NanoCom 2016)*

26. **Bhuvana Krishnaswamy** and Raghupathy Sivakumar. "Source addressing and medium access control in bacterial communication networks. *in the proceedings of ACM International Conference on Nanoscale Computing and Communication, pp.1-6 2015 (NanoCom 2015)*

27. Chao-Fang Shih, **Bhuvana Krishnaswamy**, and Raghupathy Sivakumar. "Rhythm: Achieving scheduled WiFi using purely distributed contention in WLANs. *in the proceedings of IEEE Global Communications Conference, pp.1-7 2015 (GLOBECOM 2015)*

28. Yubing Jian, Chao-Fang Shih, **Bhuvana Krishnaswamy**, and Raghupathy Sivakumar. "Coexistence of Wi-Fi and LAA-LTE: Experimental evaluation, analysis and insights." *in the proceedings of the IEEE International Conference on Communication Workshop pp.2325-2331 2015 (ICCW 2015)*

29. **Bhuvana Krishnaswamy**, Caitlin M. Austin, J. Patrick Bardill, Daniel Russakow, Gregory L. Holst, Brian K. Hammer, Craig R. Forest, and Raghupathy Sivakumar. "Time-elapse communication: Bacterial communication on a microfluidic chip." *in IEEE Transactions on Communications, 61(12), pp.5139-5151 2013.*

30. **Bhuvana Krishnaswamy**, Caitlin M. Austin, J. Patrick Bardill, Daniel Russakow, Gregory L. Holst, Brian K. Hammer, Craig R. Forest, and Raghupathy Sivakumar. "When bacteria talk: Time elapse communication for super-slow networks." *in the proceedings of IEEE International Conference on Communications, pp. 6348-6353 (ICC 2013)*

PATENTS

1. Bhuvana Krishnaswamy and Yoganand Biradavolu "In-Situ Soil Moisture Sensing With Buried Battery-Less Tags" accepted for patent internally by WARF - Ref. No. P240275.

2. Chu Ma, Dajun Zhang, Bhuvana Krishnaswamy, Muhammad Osama Shahid. "Wireless Passive Mechanical Vibration Monitor System". Patent Application filed on Feb 2024.

3. Bhuvana Krishnaswamy, Yaman Sangar, and Kai Pederson. "Long Distance Wireless Radio Tag With RF Energy Harvesting". Patent Application filed on November 2023.

4. Bhuvana Krishnaswamy, Jinyi Huang, Francisco Arriaga, Christian Martinez, Hendri Yuda Winanto, Adam Nygard "Soil gas-flux measurement system" Patent Application filed on April 2023.

5. Bhuvana Krishnaswamy and Megan McClean. "Biological Sensing And Communication Using Optogenetics And Electronics" Patent Application filed on April 2021.

6. Bhuvana Krishnaswamy and Yaman Sangar. "Wireless system using sleep-state modulation." U.S. Patent 11,039,391, issued June 15, 2021.

RESEARCH TRAINING AND SUPERVISION

Graduate Students

- PhD program : Yoganand Biradavolu, Jackie Schellberg, Muchen Sui

- MS Research program : Olivia D'Souza

- Alumni : Yaman Sangar (PhD, now PostDoc@Georgia Tech), Muhammad Osama Shahid (PhD, now Asst. Prof. at Wayne State university), Akhil Polamarasetty (MS, now PhD student at UCL), Daniel Jay Koch (MS, now @Epic Systems), Manan Mishra (MS, now @Apple), Christian Martinez (MS, now@Atlassian), Kai Pederson (MS, now @ForwardEdge ASIC).

Undergraduate Students : Guided 8 undergraduate students, of which 3 pursued graduate studies.

TEACHING EXPERIENCE

- ECE/CS 707 - Mobile and Wireless Networking	Fall 2021
- ECE 901 - Advanced Topics in Wireless Networks and Sensing	Spring 2021
- ECE 537 - Communication Networks	Spring 2019, Fall 2020, Fall 2022, Fall 2024
- ECE 554 - Digital Engineering Laboratory	Fall 2018, Fall 2019
- ECE 203 - Signal, Information, and Computation	Spring 2020, Spring 2022, Spring 2024
- ECE 736 - Wireless Communications	Spring 2023, Spring 2026
- ECE 252 - Introduction to Computer Engineering	Spring 2025, Spring 2026
- ECE 454 - Mobile Computing Laboratory	Fall 2025

SERVICE

University service

- Graduate Recruiting and Fellowship (GRAF) committee	2018-2019
- Distinguished Seminar Series committee	2019-2020, 2023-Present
- Undergraduate Advising committee	2019-2022
- MS graduate committee	2022-Present
- Faculty search and screening committee	2022

External Service

- **Technical Program Committee Chair** for NanoCom 2021

- **Posters and Demos Chair** for MobiSys 2021, MobiCom 2025

- **Travel Grant Chair** for MobiCom 2019, MobiSys 2022, COMSNETS 2025

- **N2Women Workshop Chair** for MobiSys 2024

- **Peer Review**: Served as reviewer in multiple peer-reviewed journals including Sensors, IEEE Transactions on Mobile Computing, Transactions on Communications, Computer Communications, Wireless Networks, and ACM Interactive, Mobile, Wearable and Ubiquitous Technologies.

- **Technical Program Committee Member** in NanoCom (2019, 2020, 2022, 2024) Globecom (2019, 2020), MobiCom (2021, 2022, 2023, 2024, 2025, 2026), SIGCOMM 2022, 2024, INFOCOM 2024, NSDI 2025.

- **Judge for Student Research Competition** in MobiCom 2021.

- **Mentoring** young and upcoming female and underrepresented students in N2Women, MobiCom 2019. Organized "Women in Engineering Panel" at NanoCom 2019. Panelist at N2Women - NSDI 2024

TALKS

- Scalability in Low-power Wide Area Networks, Stanford University, April 2024.

- Scalability in Low-power Wide Area Networks, IISC, Bangalore, January 2024.

- Scalability in Low-power Wide Area Networks, IIT-Madras, December 2023.

- Scalability in Low-power Wide Area Networks, Rice University, March 2023.

- Scalability in Low-power Wide Area Networks, UIUC, February 2023.

- Scalability in Low-power Wide Area Networks, Microsoft Research, February 2023.

- Scalability in Low-power Wide Area Networks, Texas A&M university, October 2022.

- Intelligent Network Systems, Athena Showcase, Duke University, August 2022.

- Scalability in Low-power Wide Area Networks, Duke Univeristy, August 2022.

- Introduction to Long range wireless through LoRa, College of Engineering, Guindy, Chennai, April 2022.

- Fundamental Challenges of Low-Power Wide Area networks, IEEE Madison chapter, October, 2021.

- Can low-power, long-range, large-scale co-exist in wireless networks?,TSSG Seminar, Waterford, Ireland, May 2020.

- Can low-power, long-range, large-scale co-exist in wireless networks?, NIST Gaithersburg, August 2019

- Towards an autonomous network of biological sensors, SILO seminar series, UW-Madison, 2018

- Algorithms and protocols for Molecular Communication, invited talk at Indian Institute of Technology, Madras, India, April 2017

- Video Streaming over WiFi : MAC and Transport layer solutions at Cisco, San Jose, USA, 2016

- Wireless Drop : A truly wireless broadband experience at CableLabs, USA , 2015

- How to train Bacteria to talk? in The Marconi Society Paul Baran Young Scholars Symposium, 2015, Georgia Tech, Atlanta

- Interference Management In Distributed WiFi Networks at Nokia Labs,, USA, 2014