BHUVANA KRISHNASWAMY
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WORK EXPERIENCE

University of Wisconsin-Madison Fall 2018-Present
Charles Ringrose Assistant Professor, Electrical and Computer Engineering

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

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

- Finalist, WARF Wisconsin Innovator Award 2019 (6 out of 300+ teams selected among all innovations in UW system)
- Finalist, WARF Wisconsin Innovator Award 2020 (6 out of 300+ teams selected among all innovations in UW system)
- Madison Teaching and Learning Excellence (MTLE) fellow
- ECE Grainger Faculty Scholarship Award 2021
- Outstanding PC member award, MobiCom 2022
- NSF CAREER Award 2022
- N2Women Rising Star 2022
- Honored Instructor 2022
- Wisconsin Hilldale Undergraduate/Faculty Research 2023-2024 Fellowship
- Early Career Innovator Award, 2023

PUBLICATIONS

1. Jiaming Wang, Sevda Öğüt, Haitham Al Hassanieh, Bhuvana Krishnaswamy "Towards Practical and Scalable Molecular Networks" accepted for publication in the Proceedings of the ACM SIGCOMM 2023.

2. Zhang, Dajun, Akhil Polamarasetty, Muhammad Osama Shahid, Bhuvana Krishnaswamy, and Chu Ma. "Passive Mechanical Vibration Processor for Wireless Vibration Sensing." arXiv preprint arXiv:2305.10687 (2023).

3. Jongho Lee, Mohit Gupta, Bhuvana Krishnaswamy, and Suman Banerjee "When Two Cameras Are a Crowd (Understanding and Handling Interference Across Multiple Active Cameras)" *accepted for publication in Communications of the ACM (CACM), 2023*

4. Manan Mishra, Daniel Koch, Muhammad Osama Shahid, Krishna Chintalapudi, Suman Banerjee, and Bhuvana Krishnaswamy. OpenLoRa: Validating LoRa Implementations through an Extensible and Open-sourced Framework. *to be published in USENIX Symposium on Networked Systems Design and Implementation (NSDI 2023)*

5. 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" *published in the Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), December 2022.*

6. Ian Petersen, Amy Cao, Anna Goforth, Anna Vena, Megan N. McClean, Benjamin Walker, Bhuvana Krishnaswamy."Microfluidic Chip for Biosensing Yeast Cells"*published in ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom) 2022.*

7. Daniel Koch, Muhammad Osama Shahid, Bhuvana Krishnaswamy "Spreading Factor Detection for low-cost Adaptive Data Rate in LoRaWAN Gateways" published at the *10th International Workshop on Energy Harvesting & Energy-Neutral Sensing Systems (ENSys), co-located with Sensys 2022.*

8. Sangar, Yaman and Biradavolu, Yoganand, and Krishnaswamy, Bhuvana "A novel time-interval based modulation for large-scale, low-power, wide-area-networks" *accepted for publication in IEEE Transactions on Sensor Networks, 2022.*

9. 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", Poster presented at the AGU Fall Meeting, 12-15 December, 2022.

10. Shahid, Muhammad Osama, Millan Philipose, Krishna Chintalapudi, Suman Banerjee, and Bhuvana Krishnaswamy. Concurrent interference cancellation: decoding multi-packet collisions in LoRa. *In Proceedings of ACM Special Interest Group on Data Communication on the applications, technologies, architectures, and protocols for computer communication (ACM SIGCOMM) 2021.*

11. Sangar, Y. and Krishnaswamy, B. WiChronos : Energy-Efficient Modulation for Long-Range, Large-Scale Wireless Networks, *Low-power Design Contest at ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED 2021)*

12. Krishnaswamy, B. and McClean, M., 2020 Shining Light on Molecular Communication *In Proceedings of ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom), 2020*

13. Sangar, Y. and Krishnaswamy, B. WiChronos : Energy-Efficient Modulation for Long-Range, Large-Scale Wireless Networks", *published in the Annual International Conference on Mobile Computing and Networking (MobiCom), 2020*

14. Sangar, Y. and Krishnaswamy, B., 2019 Poster: Time Encoding for Energy Efficiency and Scalability in Wireless Networks *in the Proceedings of the 11th workshop on Wireless of the Students, by the Students, and for the Students, 2019, Los Cabos, Mexico*

15. Sangar, Y. and Krishnaswamy, B., 2019 Link Layer Protocol for Molecular Communication Networks published *In ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom), 2019, Dublin, Ireland*

16. Krishnaswamy, B. and Sivakumar, R., 2018 Amplitude-Width Encoding for Error Correction in Bacterial Communication Networks *In Proceedings of ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom), 2018, Reykjavik, Iceland*

17. Shih, C.F., Krishnaswamy, B., Jian, Y. and Sivakumar, R., 2018. Scheduled WiFi using distributed contention in WLANs: algorithms, experiments, and case-studies. Wireless Networks.

18. Jian, Y., Krishnaswamy, B., Austin, C.M., Bicen, A.O., Einolghozati, A., Perdomo, J.E., Patel, Fekri, F., Akyildiz, I.F., Forest, C.R. and Sivakumar, R., 2017. nanoNS3: A network simulator for bacterial nanonetworks based on molecular communication. Nano communication networks.

19. Krishnaswamy, B., Jian, Y., Austin, C.M., Perdomo, J.E., Patel, S.C., Hammer, B.K., Forest, C.R. and Sivakumar, R., 2017. Adma: Amplitude-division multiple access for bacterial communication networks. IEEE Transactions on Molecular, Biological and Multi-Scale Communications.

20. Krishnaswamy, B. and Sivakumar, R., 2016, September. Advanced Receiver Designs for Bacterial Communication with Amplitude Source Addressing. *In Proceedings of the ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom), New York City, USA*

21. Jian, Y., Krishnaswamy, B., Austin, C.M., Bicen, A.O., Perdomo, J.E., Patel, S.C., Akyildiz, I.F., Forest, C.R. and Sivakumar, R., 2016, September. nanoNS3: Simulating bacterial molecular communication based nanonetworks in Network Simulator 3. *In Proceedings of ACM International Conference on Nanoscale Computing and Communication (ACM NanoCom), New York City, USA*

22. Krishnaswamy, B. and Sivakumar, R., 2015, September. Source addressing and medium access control in bacterial communication networks. *In Proceedings of the International Conference on Nanoscale Computing and Communication (ACM NanoCom), Boston, USA*

23. Shih, C.F., Krishnaswamy, B. and Sivakumar, R., 2015, December. Rhythm: Achieving scheduled WiFi using purely distributed contention in WLANs. *In IEEE Global Communications Conference (GLOBECOM), 2015, San Diego, USA*

24. Jian, Y., Shih, C.F., Krishnaswamy, B. and Sivakumar, R., 2015, June. Coexistence of Wi-Fi and LAA-LTE: Experimental evaluation, analysis and insights. *In Communication Workshop (ICCW), 2015 IEEE International Conference on, London, UK*

25. Krishnaswamy, B., Austin, C.M., Bardill, J.P., Russakow, D., Holst, G.L., Hammer, B.K., Forest, C.R. and Sivakumar, R., 2013. Time-elapse communication: Bacterial communication on a microfluidic chip. IEEE Transactions on Communications, 61(12), pp.5139-5151.

26. Krishnaswamy, B., Henegar, C.M., Bardill, J.P., Russakow, D., Holst, G.L., Hammer, B.K., Forest, C.R. and Sivakumar, R., 2013, June. When bacteria talk: Time elapse communication for super-slow networks. *In 2013 IEEE International Conference on Communications (ICC), Budapest, Hungary*

TALKS

- 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

PATENTS

- Wireless System Using Sleep-State Modulation, Bhuvana Krishnaswamy and Yaman Sangar, 2019
- A Framework for Biological Sensing and Communication Using Optogenetics And Electronics, Bhuvana Krishnaswamy and Megan McClean, 2020

- Long Distance Wireless Radio Tag With Rf Energy Harvesting, Bhuvana Krishnaswamy, Yaman Sangar, and Kai Pederson. Provisional filed in November 2022.

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
- ECE 554 - Digital Engineering Laboratory — Fall 2018, Fall 2019
- ECE 203 - Signal, Information, and Computation — Spring 2020, Spring 2022
- ECE 736 - Wireless Communications — Spring 2023

SERVICE

- **Technical Program Committee Chair** for NanoCom 2021
- **Posters and Demos Chair** for MobiSys 2021
- **Travel Grant Chair** for MobiCom 2019, MobiSys 2022
- **Peer Review**: Served as reviewer in multiple peer-reviewed journals including Sensors, IEEE Transactions on Mobile Computing, Transactions on Communications, Computer Communications, Wireless Networks.
- **Technical Program Committee Member** in NanoCom 2019, Globecom 2019, NanoCom 2020, Globecom 2020, MobiCom 2021, MobiCom 2022, SIGCOMM 2022, MobiCom 2023, INFOCOM 2024.
- **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.