

Akarsh Prabhakara

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RESEARCH	I am a wireless and cyber-physical systems researcher that builds compact wireless systems with high fidelity sensing and communication capabilities unlocking new application potentials.	
EDUCATION	Carnegie Mellon University Ph.D. in Electrical and Computer Engineering <i>Advisors:</i> Prof. Anthony Rowe and Prof. Swarun Kumar <i>Thesis:</i> High-resolution Imaging with Compact Millimeter Wave Radars	2018 - 2024
	National Institute of Technology Karnataka B.Tech. in Electronics and Communication Engineering	2014 - 2018
EMPLOYMENT	University of Wisconsin - Madison Assistant Professor in Computer Sciences Affiliate faculty in Electrical and Computer Engineering	Jan 2025 onwards
	Zendar, Berkeley Research Intern with Dr. Darsh Ranjan	May 2022 - Aug 2022
	Optum, Pittsburgh Corporate Startup Lab Fellow with Danita Kiser	May 2021 - Aug 2021
	Texas Instruments, Dallas Research Intern at Kilby Labs with Xiaolin Lu	May 2019 - Aug 2019
	Microsoft Research, Bangalore Research Intern with Dr. Harsha Simhadri	Aug 2017 - Dec 2017
	University of Lübeck, Germany Research Intern with Dr. Alfred Mertins	May 2017 - July 2017
	Indian Institute of Science, Bangalore Research Intern with Dr. GV Anand	May 2016 - July 2016
AWARDS / HIGHLIGHTS	<ul style="list-style-type: none">• ICCV Oral• CVPR Oral• Best Presentation Runner Up, Ph.D. Forum ACM/IEEE IPSN• Best Demo Runner Up, ACM/IEEE IPSN• ACM GetMobile Research Highlight for Quasar• Corporate Startup Lab Fellowship• ACM GetMobile Research Highlight for Osprey• CMU ECE Department Award for Exemplary Qualifying Exam Performance• Best Paper Honorable Mention, ACM MobiSys• Best Demo, ACM MobiSys• Carnegie Institute of Technology Dean's Fellowship• DAAD WISE Fellowship• Indian Academy of Sciences' Summer Research Fellowship• Final Fifteen of the IEEE Signal Processing Cup• Best Outgoing Student Award	2025 2024 2023 2023 2022 2021 2021 2020 2020 2020 2018-2019 2017 2016 2016 2014 and 2012

- CONFERENCE & JOURNAL PUBLICATIONS (PEER REVIEWED) **RadarSim: Simulating Single-Chip Radar via Multimodal Neural Fields.**
C Chen, T Huang, A Prabhakara, C Mummadi, Z Cong, A Rowe, M O'Toole, D Ramanan.
 3D Vision 2026.
- Towards Foundational Models for Single-Chip Radar.**
T Huang, A Prabhakara, C Chen, J Karhade, D Ramanan, M O'Toole, A Rowe.
 IEEE ICCV 2025.
 ICCV Oral (64 orals / 2702 accepted papers = 2.4%)
- Shape-programming Robotic Reflectors for Wireless Networks.**
Y Liu, A Prabhakara, J Zhu, S Qiao, S Kumar.
 IEEE ICRA 2025.
- Reinforcement Learning-Based Framework for Whale Rendezvous via Autonomous Sensing Robots.**
N Jadhav, S Bhattacharya*, D Vogt, Y Aluma, P Tønnesen, A Prabhakara, S Kumar, S Gero, R Wood, S Gil*
 Science Robotics 2024.
- Hydra: Exploiting Multi-Bounce Scattering for Beyond-Field-of-View mmWave Radar.**
N Mehrotra, D Pandey, A Prabhakara, Y Liu, S Kumar, A Sabarwal
 ACM MobiCom 2024.
- DART: Implicit Doppler Tomography for Radar Novel View Synthesis.**
T Huang, J Miller*, A Prabhakara, T Jin, T Laroia, Z Kolter, A Rowe.*
 IEEE/CVF CVPR 2024.
 CVPR Oral (90 orals / 2719 accepted papers = 3.3%)
- High Resolution Point Clouds from mmWave Radar.**
A Prabhakara, T Jin, A Das, G Bhatt, L Kumari, E Soltanaghai, J Bilmes, S Kumar, A Rowe.
 IEEE ICRA 2023.
- Platypus: Sub-mm μ -Displacement Sensing with Passive mmWave Tags As Phase Carriers.**
T King, J. He, C. Yao, A Prabhakara, M Alipour, S Kumar, A Rowe, E Soltanaghai.
 ACM/IEEE IPSN 2023.
- Exploring mmWave Radar and Camera Fusion for High-Resolution and Long-Range Depth Imaging.**
A Prabhakara, D Zhang*, C Li, S Munir, A Sankaranarayanan, A Rowe, S Kumar.*
 IEEE/RSJ IROS 2022.
- Zoom Out: Abstractions for Efficient Radar Algorithms on COTS architecture.**
TM Low, Y Chi, J Hoe, S Kumar, A Prabhakara, L Shi, U Sridhar, N Tukanov, C Wang, Y Wu.
 IEEE Phased Array Systems and Technology (PAST) 2022.
- Millimetro: mmWave Retro-Reflective Tags for Accurate, Long Range Localization.**
E Soltanaghaei, A Prabhakara*, A Balanuta*, M Anderson, J Rabaey, S Kumar, A Rowe.*
 ACM MobiCom 2021.
- A Community-Driven Approach to Democratize Access to Satellite Ground Stations.**
V Singh, A Prabhakara, D Zhang, O Yağan, S Kumar.
 ACM MobiCom 2021.
 ACM GetMobile Research Highlight
- TagFi: Locating an Ultra-Low Power Tag Using Existing WiFi Infrastructure.**
E Soltanaghaei, A Dongare, A Prabhakara, S Kumar, A Rowe, K Whitehouse.
 Ubicomp 2021.

	Osprey: A mmWave Approach to Tire Wear Sensing. <i>A Prabhakara, V Singh, S Kumar, A Rowe.</i> ACM MobiSys 2020. Best Paper Honorable Mention, ACM GetMobile Research Highlight Press: Gizmodo , Hackster.io , TedX Innovation Expo and That's Cool News Podcast .
	Underwater Acoustic Source Localization by Vector Sensor Array using Compressive Sampling. <i>PV Nagesha, GV Anand, S Gurugopinath, A Prabhakara.</i> MTS/IEEE Oceans 2016.
WORKSHOPS (PEER REVIEWED)	Privacy-Aware Sharing of Raw Spatial Sensor Data for Cooperative Perception. <i>B Liu, C Yan, C Jiang, S Banerjee, A Prabhakara.</i> HotMobile 2026.
POSTERS, DEMOS, MAGAZINES (PEER REVIEWED)	RadarHD: Demonstrating Lidar-like Point Clouds from mmWave Radar. <i>A Prabhakara, T Jin, A Das, G Bhatt, L Kumari, E Soltanaghai, J Bilmes, S Kumar, A Rowe.</i> ACM MobiCom Demo 2023. Top 5 Best Demos
	Pushing the Limits of High Resolution Sensing with Single-Chip mmWave Radar. <i>A Prabhakara.</i> ACM/IEEE IPSN Ph.D. Forum 2023. Best Presentation Runner Up
	Demo Abstract: Platypus: Sub-mm μ-Displacement Sensing with Passive mmWave Tags As Phase Carriers. <i>J. He, T King, C. Yao, A Prabhakara, M Alipour, S Kumar, A Rowe, E Soltanaghai..</i> ACM/IEEE IPSN Demo 2023. Best Demo Runner Up
	A Community-Driven Approach to Democratize Access to Satellite Ground Stations. <i>V Singh, A Prabhakara, D Zhang, O Yağan, S Kumar.</i> ACM GetMobile Magazine Mar 2022.
	Long-range Accurate Ranging of Millimeter-wave Retro-reflective Tags in High Mobility. <i>TH King, E Soltanaghai, A Prabhakara, A Balanuta, S Kumar, A Rowe.</i> ACM MobiCom Demo 2021.
	OSPREY: A mmWave Approach to Tire Wear Sensing. <i>A Prabhakara, V Singh, S Kumar, A Rowe.</i> ACM GetMobile Magazine Dec 2020.
	Osprey Demo: A mmWave Approach to Tire Wear Sensing. <i>A Prabhakara, V Singh, S Kumar, A Rowe.</i> ACM MobiSys Demo 2020. Best Demo
PATENTS	Creating and using synthetic radar views of a scene <i>A Prabhakara, A Rowe, J Z Kolter, J Miller, T Huang, A Hamann, D Ziegenbein, T Jin</i> Patent Pending, DE102023213282A1
	Methods, Systems And Low Power Retrodirective RF Tags for Localization. <i>E Soltanaghaei, A Rowe, S Kumar, A Prabhakara, A Balanuta</i> US 12,366,649 B2

Tire Sensing Systems and Methods.

A Prabhakara, V Singh, S Kumar, A Rowe, T Wei, H Dorf
US 12,358,329 B2

TEACHING

- At UW-Madison
End-of-semester teaching evaluations, based on the following questions. Range of responses (1-7), on a scale of increasing quality of experience.
 - Q1: How often did the instructor create a positive, engaging learning environment?
 - Q2: How likely are you to recommend the course to fellow students?
 - Q3: How likely are you to recommend this instructor to fellow students?
 - Q4: How often was the instructor available to answer questions and concerns (in class, during office hours, via email)?

Sem	Course Name	Number of Students Enrolled	Q1	Q2	Q3	Q4
S25	839: Big Ideas in Wireless: Perception and Comms.	11	6.38	6.25	6.38	7

- Graduate Teaching Assistant at CMU
 - Wireless Communication
 - Computer Networks
- Fall 2021
- Spring 2020
- Guest Lectures
 - Intro to Computer Systems, CMU ECE
 - Advanced Topics in Communication, Washington ECE
- Spring 2023
- Spring 2023

PROGRAM COMMITTEE

- 2026: MobiCom, SenSys
- 2025: MobiCom (Winter), MobiSys

PEER REVIEWING

- 2025: npj Wireless Tech, ICRA, IROS, IMWUT, Transactions on IoT, SenSys Posters, ENSsys
- 2024: MobiCom Posters, ICRA, IMWUT, RAL, ToN, Network Magazine
- 2023: Transactions on Networking (ToN), Intelligent Vehicles (TIV), Sensor Networks (ToSN)
- 2022: IMWUT, Transactions on Sensor Networks (ToSN)
- 2021: Shadow Program Committee ACM Compass

ORGANIZATION AND LEADERSHIP

- Publication co-chair for ACM MobiCom
- Publicity co-chair for ACM SenSys
- S3 workshop co-chair at ACM MobiCom

RESEARCH TALKS

- ASU, NC State, UCLA, University of British Columbia, UW-Madison
High quality sensing from compact radio frequency systems
- ICRA 2023
High resolution point clouds from mmWave radar
- Microsoft Research India
Pushing the limits of high resolution sensing with single-chip mmWave radar
- IROS 2022
Exploring mmWave radar and camera fusion for high-resolution and long-range depth imaging
- DARPA/SRC CONIX Annual Review
RF Sensing: CONIX and beyond ...
- TedX CMU Innovation Expo
- MobiSys 2020
Osprey: A mmWave approach to tire wear sensing
- DARPA/SRC CONIX Student Seminar
Osprey: A mmWave approach to tire wear sensing

PRESS
ARTICLES

- Pioneering Minds
“[Low Power, High Accuracy Tag That Can Improve Autonomous Driving](#)”
- That's Cool News Podcast
“[Osprey: Utilizing mmWaves to Sense Vehicle Tire Wear and Tear — Akarsh Prabhakara](#)”
- Hackster.io
“[Researchers Develop System That Monitors Tire Wear in Real-Time](#)”
- Gizmodo
“[Researchers Find That Radar Can Be Used to Detect a Nail in a Tire Long Before It Goes Flat](#)”
- Weibold
“[Radar to monitor tire wear developed by American engineers](#)”
- Wonderful Engineering
“[This Radar Based Device Can Detect Tire Punctures Along With Wear And Tear](#)”
- Interesting Engineering
“[Radar Can Be Used to Detect Tire Wear and Tear, Nail Punctures](#)”
- Tyrepress.com
“[Measuring tyre wear with on-car radar](#)”

ENGINEERING
TEAM
COMPETITIONS

DARPA Subterranean Challenge 2019

As part of the winning [CMU team](#), I performed initial experimentation on wireless mesh networking for consistent communication among robots, access points and base station in mines and caves.

IEEE Signal Processing Cup 2017

We built a real-time beat tracking algorithm running on an embedded device reacting to a variety of music signals. Check out our trippy visualizations [here!](#).

IEEE Signal Processing Cup 2016

We developed a solution to extract power signal leaking into recorded audio signals and geolocate the power grid where audio was recorded. We finished top 15 in the world!