

# Nakul Garg

<b>Contact Information</b>	3245 Brendan Iribe Center 8125 Campus Drive College Park, MD 20742	+1 202-725-1919 nakul22@umd.edu <a href="https://www.cs.umd.edu/~nakul/">https://www.cs.umd.edu/~nakul/</a>
<b>Research Interests</b>	Sustainable Computing, Low-power Sensing, Wireless Networking and Communication, Embedded AI	
<b>Education</b>	<b>Ph.D.</b> , Computer Science University of Maryland, College Park	2019–2025 (expected)
	<b>Bachelor of Technology</b> , ECE IPU, Delhi, India	2014–2018
<b>Awards &amp; Honors</b>	<ul style="list-style-type: none"><li>• Distinguished Artifact Reviewer, MobiSys</li><li>• CPS Rising Star Award, NSF</li><li>• Best Poster Award, MobiSys</li><li>• Ann G. Wylie Dissertation Fellowship</li><li>• UMD Future Faculty Fellowship</li><li>• Outstanding Graduate Assistant Award</li><li>• Best Paper Award, MobiSys</li><li>• Three Minute Thesis (3MT) Award</li><li>• Best Demo Award, MobiSys</li><li>• UMD CS Summer Research Fellowship</li><li>• UMD Graduate School Dean’s Fellowship</li><li>• Outstanding Student Volunteer, IEEE Delhi Section.</li><li>• Winner of World Food India Hackathon. Awarded by the President of India.</li><li>• Winner of Celestini Project India 2017, IIT Delhi &amp; Marconi Society.</li><li>• Winner of eYantra - National Robotics Competition, IIT Bombay</li></ul>	2024 2024 2023 2023 2023 2023 2022 2022 2021 2021 2019 2018 2017 2017 2017
<b>Selected Publications</b>	Sirius: A Self-Localization System for Resource-Constrained IoT Sensors <b>Nakul Garg</b> , Nirupam Roy Mobisys 2023 <b>Best Poster Award</b>	
	Structure Assisted Spectrum Sensing for Low-power Acoustic Event Detection <b>Nakul Garg</b> , Harshvardhan Takawale, Yang Bai, Irtaza Shahid, Nirupam Roy IASA CPS IoT Week 2023	
	ThermWare: Towards Side-channel Defense for Tiny IoT Devices <b>Nakul Garg</b> , Irtaza Shahid, Erin Avllazagaj, Jennie Hill, Jun Han, Nirupam Roy HotMobile 2023	
	SPiDR: Ultra-low-power Acoustic Spatial Sensing for Micro-robot Navigation Yang Bai, <b>Nakul Garg (co-primary)</b> , Nirupam Roy Mobisys 2022 <b>Best Paper Award</b>	
	VoiceFind: Noise-Resilient Speech Recovery in Commodity Headphones Irtaza Shahid, Yang Bai, <b>Nakul Garg</b> , Nirupam Roy IASA Workshop Mobisys 2022	

Owlet: Enabling Spatial Information in Ubiquitous Acoustic devices  
**Nakul Garg**, Yang Bai (co-primary), Nirupam Roy  
Mobisys 2021 **Best Demo Award**

Enabling Self-defense in Small Drones  
**Nakul Garg**, Nirupam Roy  
HotMobile 2020

Evaluating LED-Camera Communication for Drones  
Bhawana Chhaglani, Abhay Sheel Anand, **Nakul Garg**, Ashwin Ashok  
LioT Workshop Mobicom 2020

**Selected Demos & Poster** Poster: Ultra-low-power Angle-of-Arrival Estimation Using a Single Antenna  
**Nakul Garg**, Nirupam Roy  
Mobisys 2023

Poster: Bringing AR/VR to Everyday Life- A Wireless Localization perspective  
**Nakul Garg**, Irtaza Shahid, Karthik Sankar, Mallesham Dasari, Ram Sheshadri, Karthikeyan Sundaresan, Nirupam Roy  
HotMobile 2023

Poster: Natural Voice Interface for the Next Generation of Smart Spaces  
Yang Bai, **Nakul Garg**, Harshvardhan Takawale, Anupam das, Nirupam Roy  
HotMobile 2023

Poster: Ultra-low-power Acoustic Imaging  
Yang Bai, **Nakul Garg (co-primary)**, Nirupam Roy  
Mobisys 2022

Demo: Microstructure-guided Spatial Sensing for Low-power IoT  
**Nakul Garg**, Yang Bai (co-primary), Nirupam Roy  
Mobisys 2021

Poster: Acoustic Sensing for Detecting Projectile Attacks on Small Drones  
**Nakul Garg**, Nirupam Roy  
HotMobile 2020

Poster: DRIZY- Collaborative Driver Assistance Over Wireless Networks  
**Nakul Garg**, Ishani Janveja, Divyansh Malhotra, Chetan Chawla, Pulkit Gupta, Harshil Bansal, Aakanksha Chowdhery, Prerana Mukherjee, Brejesh Lall  
MobiCom 2017

**Experience** **Research Intern** May. 2024—June. 2024  
Microsoft Research  
Advised by : Dr. Vaishnavi Ranganathan, Dr. Ranveer Chandra

**Research Intern** May. 2023—Aug. 2023  
Microsoft Research  
Advised by : Dr. Vaishnavi Ranganathan, Dr. Ranveer Chandra

**Research Intern** May. 2022—Aug. 2022  
NEC Laboratories  
Advised by : Prof. Karthik Sundaresan, Dr. Ramanujan K Sheshadri

**Research Intern** Sept. 2018—July 2019  
Computer Science Department, IIT Delhi  
Advised by : Dr. Rijurekha Sen

**Technical Advisor** May 2018—Sept. 2018  
Celestini Project India, Marconi Society, Google, IIT Delhi  
Led by : Dr. Aakanksha Chowdhery (Google AI) and Dr. Brejesh Lall (IIT Delhi)

**Research Intern** Jun. 2017—Sept. 2017  
Celestini Project India, Marconi Society, Google, IIT Delhi  
Advised by : Dr. Aakanksha Chowdhery (Google AI) and Dr. Brejesh Lall (IIT Delhi)

**Selected Talks** **Guest Lecture:** Scaling Down to Scale Up: A New Paradigm in Wireless Sensing for Robotics and Perception  
Oct 13, 2023  
Worcester Polytechnic Institute (Online)

**Guest Lecture:** Uncompromised Sensing for Resource-Constrained IoT  
May 18, 2023  
University of Washington (Online)

**Seminar:** Ultra-low-power Perception for Micro-robots  
Sept 9, 2022  
Maryland Robotics Center

**Guest Lecture:** Toward Battery-free robots  
April 26, 2022  
First-Year Innovation & Research Experience, UMD

**3MT Seminar:** Inventing Battery-free Devices for a Sustainable Present  
April 6, 2022  
University of Maryland College Park, USA

**Guest Lecture:** Powering up the Next Generation of Robots  
Nov 16, 2021  
First-Year Innovation & Research Experience, UMD

**Invited Talk:** Owlet: Enabling Spatial Information in Ubiquitous Acoustic devices  
July 19, 2021  
Stony Brook University (Online)

**Invited Talk:** Owlet: Enabling Spatial Information in Ubiquitous Acoustic devices  
July 15, 2021  
University of Illinois Urbana-Champaign (Online)

**Teaching** Teaching Assistant: Wireless and Mobile Systems for the IoT, Fall 2021-23  
Instructor: Prof. Nirupam Roy

Workshop: TinyML and TensorFlow Lite, 2022

Teaching Assistant: Computer Networks, Spring 2020, Spring 2023  
Instructor: Prof. Nirupam Roy

Workshop: Socket Programming 101, 2022

Teaching Assistant: Advanced Data Structures, Fall 2019, Spring 2021  
Instructor: Prof. David Mount

Workshop: Embedded AI and Robotics, 2016-18

- Media Coverage**
- **SPiDR**: ACM SigMobile Research Highlight, ACM GetMobile
  - **Owlet**: ACM GetMobile
  - **DopplerDodge**: The Economist, Robotics Industry News, ...
  - **Aerogram**: Times of India, Hindustan Times, ...

**Professional  
Activities**

Program Committees:

- MobiSys Artifact Evaluation (**Distinguished Reviewer Award**) 2024
- ACM S3 Workshop 2023
- MobiCom Artifact Evaluation 2023
- SenSys Shadow TPC 2022
- IMWUT 2023,24
- IEEE Transactions on Mobile Computing 2022

Organizing Committees:

- TPC Co-chair, S3 Workshop at MobiCom 2024
- Social Media Chair, COMSNETS 2024
- Web Chair, IASA CPS IoT Week 2023

Mentorship & Leadership:

- Mentor Bitcamp Research Trail
  - An initiative to engage BIPOC students in research 2021
- President, IEEE student chapter in university 2017
- Chairperson, Robotics and Automation Society - Taught 50 workshops 2016