

Rajalakshmi Nandakumar

PhD Candidate
Paul G. Allen School of Computer Science
University of Washington, Seattle
rajaln@cs.washington.edu

Research Interests

Mobile Systems, Wireless health, IoT sensing

Education

- 2013-Current Ph.D. Candidate, Computer Science and Engineering
Networks and Mobile Systems Lab
University of Washington
- 2007-2011 B.Tech., Computer Science and Engineering
College of Engineering Guindy, India

Research Experience

- 2011-2013 Microsoft Research India
Research Assistant
Mobility Networks and Systems Group

Awards

- 2018 ACM SenSys Best Paper Award 2018
2018 Marconi Society Paul Baran Young scholar award 2018
2018 UW Medicine Judy Su Clinical Research award 2018
2018 Geekwire, Geek of the week 2018
2016 UW CoMotion Graduate Student Innovator award 2016
2016 Best Presentation award Microsoft Student summit 2016
2016 Honorable Mention award CHI 2016
2015 Madrona Venture Group award for ApneaApp 'Runner Up' 2015
2014 Best Presentation award, Sensys 2014

Technology Transfer

- ApneaApp Our contactless sleep apnea detection technology was licensed by ResMed Inc., which is a major sleep health company. The iPhone application, SleepScore using my active sonar technology was released on Aug 2018 for tracking sleep stages.
- WiGestures Our work on Wi-Fi gesture recognition work was licensed by TandemLaunch, Inc.
- OpiodApp Our work on opioid overdose detection on smartphones is being commercialized by a UW startup named Sound Life Sciences, Inc.
- EarApp Our work on detecting ear effusion using smartphones is being commercialized by a UW startup named Edus Health, Inc.

Research Publications

- 2019 **Opioid Overdose detection using smartphones**
Rajalakshmi Nandakumar, Jacob Sunshine, Shyam Gollakota
Science Translational Medicine 2019

LivingIoT: A flying platform on Live insects

Rajalakshmi Nandakumar, Vikram Iyer, Anran Wang, Sawyer B. Fuller, Shyam Gollakota
ACM MobiCom 2019 [**Highest ranked paper**]

2018

3D localization for sub-centimeter sized devices

Rajalakshmi Nandakumar, Vikram Iyer, Shyam Gollakota
ACM SenSys 2018 [**Best paper award**]

2017

CovertBand: Activity Information Leakage using Music

Rajalakshmi Nandakumar, Tadayoshi Kohno, Alex Takakuwa, Shyam Gollakota.
ACM Ubicomp 2017

Charging a Smartphone across the room using Lasers

Vikram Iyer, Elyas Bayati, Rajalakshmi Nandakumar, Arka Majumdar, Shyam Gollakota
ACM Ubicomp 2017

2016

FingerIO: Using Active Sonar for Fine-Grained Finger Tracking

Rajalakshmi Nandakumar, Vikram Iyer, Desney Tan, Shyam Gollakota
ACM CHI 2016 [**Honorable Mention**]

2015

Contactless Sleep Apnea Detection on Smartphones

Rajalakshmi Nandakumar, Shyam Gollakota, Nathaniel Watson
MobiSys 2015 [**Best Paper Nominee**]

2014

Wi-Fi Gesture Recognition on Existing Devices

Rajalakshmi Nandakumar, Bryce Kellogg, Shyam Gollakota
CoRR abs/1411.5394 (2014)

Feasibility and Limitations of Wi-Fi Imaging

Rajalakshmi Nandakumar, Donny Huang, Shyam Gollakota
Sensys 2014 [**Best Presentation award**]

GlimpseData: Towards Continuous Vision-Based Personal Analytics

Seungyeop Han, Rajalakshmi Nandakumar, Matthai Philipose, Arvind Krishnamurthy,
David Wetherall
Physical analytics workshop, MobiSys 2014

2013

Dhwani: Secure Peer-to-Peer Acoustic NFC

Rajalakshmi Nandakumar, Krishna Kant Chintalapudi, Venkat Padmanabhan and
Ramarathnam Venkatesan
Sigcomm 2013

2012

Centaur: Locating Devices in an Office Environment

Rajalakshmi Nandakumar, Krishna Kant Chintalapudi, Venkat Padmanabhan
MobiCom 2012.

Teaching Experience

Course Instructor CSE599N1: Modern Mobile Systems (Fall 2018)

Teaching Assistant CSE461: Introduction to Computer Communication Networks (Fall 2017, Fall 2013)
CSE561: Computer Communication Networks (Spring 2014)

Academic Community Service

PC member MobiCom 2019 – ACM international conference on Mobile Computing and Networking

External Reviewer Ubicomp 2018 – ACM international conference on Ubiquitous and Pervasive computing

Journal Reviewer TMC – Transactions on Mobile Computing
IEEE Sensors Journal
IEEE Wireless Communication

Grant Proposal Writing

Granted NSF CSR: Small: Transforming Mobile Devices into Active Sonar Systems for Medical Applications

Under submission SCH: INT: Opioid Overdose Detection and Reversal Using Sensors and Mobile Devices

Media Outreach

Living IoT *CNBC*, Researchers are turning bumblebees into live drones
IEEE Spectrum, Scientists outfit bees with wireless sensors to create “Living IoT Platform”
Seattle Times, Backpack-wearing bumblebees could buzz fields
TechCrunch, Bumblebees bearing high-tech backpacks act as living data collection platform

Wireless phone Charging *Wired*, The phone charger of the future will go pew pew
Forbes, These researchers used a laser to wirelessly charge a smartphone

Covertband *Daily Mail*, Is that music tracking you?
Register, Boffins blast beats to bury secret sonar in your smart home

FingerIO *Geekwire*, Sonar technology developed at UW tracks finger movement in mid air
Digital Trends, FingerIO’s finger wagging sonar controls may make smartwatches more usable in future

ApneaApp *Prevention Magazine* named ApneaApp as a ‘Medical Breakthrough in 2016’
Sleep Review, ApneaApp detects sleep apnea via smartphone with 95% to 99% accuracy.
Geekwire, University of Washington develops app to detect signs of sleep apnea at home.
Livescience, ApneaApp detects signs of the sleep disorder.

Dhwani *Register UK*, Dhwani. SQUEEEEE! Microsoft goes retro with pay-by-squawk NFC tech.