Roshan Ayyalasomayajula

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Research Interests

Wireless systems, wireless sensing and localization, machine learning, computer vision, autonomous systems, privacy and security.

Education

2017-2023 (expected) **Doctor of Philosophy (Ph.D.)**, *University of California San Diego, Jacobs School of Engineering*, PI: Prof. Dinesh Bharadia..
Major: Signal and Image Processing.
- Expected graduation by June 2023. Thesis committee chaired by Dinesh Bharadia and with committee members: Deepak Vasisht, Peter Gerstoft, Nuno Vasconcelos, Xinyu Zhang, and Alex Snoeren.

2017-2019 **Masters (M.S.)**, *University of California San Diego, Jacobs School of Engineering*, PI: Prof. Dinesh Bharadia..
Major: Electrical and Computer Engineering, ***GPA: 3.86 (out of 4)***

2012-2016 **Bachelors of Technology (B.Tech.)**, *Indian Institute of Technology (IIT Roorkee)*, India.
Major: Electronics and Communication Engineering, ***GPA: 9.17 (out of 10)***
- Departmental Rank 2

Mentoring and Teaching Experience

Winter 2020 **Teaching Assistant**, *UCSD, ECE 257B - Principles of Wireless Networks or Modern Wireless Communications*.
Helped the professor schedule the classes, design and grade assignments and examinations.

Summer 2018, 2019, and 2020 **PhD Mentor, SRIP**, *UCSD ECE Department*.
Guided a Masters student and four undergraduate students in their research towards summer internship at UCSD in the Summer Research Internship Programme (SRIP)

Fall, 2019. Winter, Spring 2020 **Graduate Mentor, JUMP**, *UCSD ECE Department*.
Was a graduate mentor to 2 undergraduate students within the Jacobs Undergraduate Mentoring program.

2018-ongoing **Ph.D. Mentor**, *WCSNG, UCSD*.
Mentoring and Leading the Wireless Localization team in the lab.

Professional Services

2022- **Program Committee (PC)**.
Workshop on Millimeter-Wave and Terahertz Networks and Sensing Systems (mmNets) with Mobicom'23 – Publicity co-chair
International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP 2023) – TPC
ACM SenSys 2022 – Shadow PC

2022 **Presented and organized Kaggle compeition and WILD datasets**.
1st International workshop on Wireless AI perception, CVPR 2022

2019–2022 **Technical Reviews**.
IEEE Trans. Mobile Computing (TMC) 2021-22
IEEE/ACM Trans. on Networking 2021-22
International Journal of Robotics Research 2021-22
IEEE Robotics and Automation Letters 2021-22
IEEE International Conference on Robotics and Automation (ICRA) 2020-21
IEEE Transactions on Instrumentation and Measurement 2020-21
ACM IMWUT 2020-21

Journal Publications

JASA Vol.150 Issue 2021 — Yifan Wu, **Roshan Ayyalasomayajula**, MichaelBianco, Dinesh Bharadia, Peter Gerstoft. Sound source localization based on multi-task learning and image translation network. In The Journal of the Acoustical Society of America 150, 3374 (2021); doi: 10.1121/10.0007133

IMWUT Vol.5 Issue 3 2021 — Minghui Zhao, Tyler Chang, Aditya Arun, **Roshan Ayyalasomayajula**, Chi Zhang, Dinesh Bharadia. ULoc: Low-Power, Scalable and cm-Accurate UWB-Tag Localization and Tracking for Indoor Applications. In Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 5.3 (2021): 1-31.

Conference Publications

RA-L/ICRA 2022 — Aditya Arun, **Roshan Ayyalasomayajula**, Chenfeng Wu, Joel Bisarra, Tyler Chang, Dinesh Bharadia. P^2SLAM: Two-Way Bearing-based WiFi SLAM for Indoor Navigation. In submission to The 2021 International Conference on Robotics and Automation (ICRA 2021). IEEE, Xi'an, China

ICASSP 2021 — Yifan Wu, **Roshan Ayyalasomayajula**, Michael Bianco, Dinesh Bharadia, Peter Gerstoft. Blind Sound Source Localization based on Deep Learning. In proceedings of the 46th edition of The international Conference on Acoustics, Speech, & Signal Processing (ICASSP'21).IEEE, Toronto, Canada

NSDI 2020 — **Roshan Ayyalasomayajula**, Srivatsan Rajagopalan, Aditya Arun, Shreya Ganesaraman, Aravind Seetharman, Chenfeng Wu and Dinesh Bharadia. LocAP: Accurate Localization of Existing WiFi Infrastructure . In proceedings of 17th USENIX Symposium on Networked Systems Design and Implementation(NSDI'20).USENIX, Santa Clara, CA, USA

Mobicom 2020 — **Roshan Ayyalasomayajula**, Aditya Arun, Chenfeng Wu, Sanatan Sharma, Abhishek Sethi, Deepak Vasisht, and Dinesh Bharadia. Deep learning based wireless localization for indoor navigation. In Proceedings of the 26th Annual International Conference on Mobile Computing and Networking.ACM, London, UK.

CONEXT 2018 — **Roshan Ayyalasomayajula**, Deepak Vasisht, and Dinesh Bharadia. BLoc: CSI-based Accurate Localization for BLE Tags . In Proceedings of International Conference on emerging Networking EXperiments and Technologies (CoNEXT'18).ACM, New York, NY, USA.

CVIP 2017 — **Roshan Ayyalasomayajula** and Pankajakshan, V., 2017. Differentiating Photographic and PRCG Images Using Tampering Localization Features. In Proceedings of International Conference on Computer Vision and Image Processing (pp. 429-438). Springer, Singapore.

Workshop Publications

HotMobile 2023 — **Roshan Ayyalasomayajula**, Aditya Arun, Wei Sun, Dinesh Bharadia.Users are Closer than they Appear: Protecting User Location from WiFi APs. Accepeted In The 24th International Workshop on Mobile Computing Systems and Applications (2022).

Posters & Demos

Mobisys 2022 — Aditya Arun, Tyler Chang, Yizheng Yu, **Roshan Ayyalasomayajula**, Dinesh Bharadia. Demo: Real-Time Low-Latency Tracking for UWB tags. In proceedings of the 20th ACM International Conference on Mobile Systems, Applications, and Services. Portland, Oregon, USA

NSDI 2020 — **Roshan Ayyalasomayajula**, Srivatsan Rajagopalan, Aditya Arun, Shreya Ganesaraman, Aravind Seetharman, Chenfeng Wu and Dinesh Bharadia. LocAP: Accurate Localization of Existing WiFi Infrastructure . In proceedings of 17th USENIX Symposium on Networked Systems Design and Implementation(NSDI'20).USENIX, Santa Clara, CA, USA

Patents

US Patent 11/140,651 — **Ayyalasomayajula SR**, Bharadia D, Vasisht D, Katabi D, inventors. Location determination of wireless communications devices. United States patent application US 16/731,738. 2020 Jul 2.

US Patent 17/604,380) — **Ayyalasomayajula SR**, Bharadia D, Ganesaraman S, Jain I, Rajagopalan S, Seetharaman A, Sharma S, Arun A, Wu C, inventors. Wireless device localization. United States patent application US 17/604,380. 2022 Jun 23.

Awards and Honours

- Received ECE UCSD fellwoship for the years 2017-18
- Achieved 2nd highest GPA: 2016 Final year ECE, IIT Roorkee.
- Secured All India Rank 2672 (amongst 0.5 million students) in IIT- Joint Entrance Exam 2012.
- Secured All India Rank 37 (amongst 1.3 million students) in AIEEE (All India Engineering Entrance Examination) 2012.

Work Experience

April–July 2021 **Microsoft Research**, *Remote Intern*.
Topic: **Soil Parameter Estimation** | Mentors: Bodhi Priyantha
- Developed a simple signal strength based soil parameter estimation model
- Tested the system on various soil samples

March–June 2020 **Nokia Bell Labs**, *Remote Intern*.
Topic: **Passive WiFi Sensing** | Mentors: Enrico Rantala, Swetha Muniraju
- Worked towards developing a passive WiFi based activity sensor for home applications
- Developed a basic framework to analyze the data using deep learning tools
- verified the failure cases of this system in real-world setups

References

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