Aditya Arun

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Research interests

- Robot localization and navigation
- WiFi and UWB-based localization
- Passive wireless sensing

Education

In Progress. **PhD, ECE**
Univ of California, San Diego

2021. **M.S., ECE, Robotics and Systems**
Univ of California, San Diego
GPA: 3.54

2019. **B.S., (Hons) EECS, Eng. Physics**
Univ of California, Berkeley
GPA: 3.82

Programming Languages

Python	●●●●
Matlab	●●●○
ROS	●●●○
C/C++	●●●○
Java/Android	●●○○

Research Experience

June '19 – Present **Graduate Student Researcher**,
Advisor: Dinesh Bharadia

Development of end-to-end system to perform wireless indoor localization and mapping.

Projects undertaken include:

VioFi : Tight fusion of WiFi and camera features to develop a robust and low-cost robot localization and mapping system.

P2SLAM : Identify the use of WiFi access points as bearing-sensors for integration within current robot frameworks.

ULoc : Low-power and low-latency accurate UWB-based 3D localization scalable to thousands of miniature tags.

Mar '18 – Jan '19 **Undergraduate Researcher**,
Advisor: Avideh Zakhor

Development of an Android application to fuse Intel RealSense camera information with Google ARCore "poses" to generate 3D point-cloud of indoor spaces.

Devising methodologies to stitch and render point-clouds and remove noise and drift in camera poses.

Aug '17 – Jan '18 **Undergraduate Researcher**,
Advisor: Ali Javey

Design of PCB's to test various types of electro-chemical and gas sensors.

Testing and development of electro-chemical sweat-glucose sensor.

Work Experience

May '17 – Aug '17 **Optical Engineering Intern**, Irixi Technologies

Spearheaded the implementation of PAM-4 signaling to enable 400G optical communications.

Worked on Python/C++ simulations for PAM-4 signaling.

Projects

Implementing a basic 802.11 modulation/demodulation and packet processing scheme.

Accurate RSSI based indoor localization using a multi-input multi-output LSTM network.

Last updated: May, 2022.

Publications

Arun, A., Ayyalasomayajula, R., Hunter, W., and Bharadia, D. (2022). P2SLAM: Bearing based WiFi SLAM for Indoor Robots. IEEE Robotics and Automation Letters.

Zhao, M., Chang, T., **Arun, A.**, Ayyalasomayajula, R., Zhang, C., Bharadia, D. (2021). ULoc: Low-Power, Scalable and cm-Accurate UWB-Tag Localization and Tracking for Indoor Applications. Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies, 5(3), 1-31.

Ayyalasomayajula R. , **Arun A.**, Wu C., Sharma S., Sethi A., Vasisht D., Bharadia D. (2020). "Deep Learning based Wireless Localization for Indoor Navigation." The 26th Annual International Conference on Mobile Computing and Networking (Mobicom). ACM, 2020.

Ayyalasomayajula R., **Arun A.**, Wu C., Rajagopalan S., Ganesaraman S., Seetharaman A., Jain I., Bharadia D. (2020). "LocAP: Autonomous millimeter accurate mapping of WiFi infrastructure. In 17th USENIX Symposium on Networked Systems Design and Implementation" (NSDI 20) (pp. 1115-1129).

Presentations, Posters, Demos

Arun, A., Chang, T., Yu, Y., Ayyalasomayajula R., Bharadia D. *Demo*: Real-Time Low-Latency Tracking for UWB tags. In Proceedings of the 20th Annual International Conference on Mobile Systems, Applications, and Services (Mobisys '22)

Arun, A., Gupta, A., Bhatka, S., Komatineni, S., Bharadia, D. (2020, November). *Poster*: BluBLE, space-time social distancing to monitor the spread of COVID-19. In Proceedings of the 18th Conference on Embedded Networked Sensor Systems (Sensys '20) (pp. 750-751).

Arun A., Wu C., Ayyalasomayajula R., Jain I., and Bharadia D. *Poster*: Towards CSI enabled Closed-loop WiFi based SLAM. In 17th USENIX Symposium on Networked Systems Design and Implementation" (NSDI 20)

Teaching and Mentoring Experience

Aug '21 – present **Research Mentor for highschool students**, Polygence.

July '19 – present **Research mentor for undergradute students**, UC San Diego. I have had the pleasure to mentor multiple students during the course of my PhD, notably Chenfeng Wu, Minghui Zhao, Tyler Chang and William Hunter, who have gone on to co-author papers within our group.

Jan '18 – May '19 **EE16B Undergraduate Student Instructor**, EECS Dept., UC Berkeley.

Aug '17 – May '19 **Peer Advisor**, Engineering Student Services (ESS), UC Berkeley.

Coursework

- Probability and Random Processes
- Cooperative control and Multi-agent systems
- Sensing and Estimation in Robotics
- Linear Algebra
- Statistical and Machine Learning
- Image and Signal Processing
- Communication Networks