

# (SD2022-254) Enabling WiFi Sensing for Robot Localization and Navigation

Tech ID: 33150 / UC Case 2021-Z08-1

## ABSTRACT

Researchers from UC San Diego have developed a technology that integrates WiFi as a sensor to simultaneously locate the robot and Map the WiFi access point (APs) in the environment.

The invention allows for any WiFi receiver and transmitter to be repurposed to be used for localization purposes for a robot. The invention makes use of both WiFi access points deployed in the environment and one deployed on the robot to get accurate location of the robot in large spaces.

Simultaneous localization and mapping (SLAM) is the computational problem of constructing or updating a map of an unknown environment while simultaneously keeping track of an agent's location within it.

## TECHNOLOGY DESCRIPTION

### Background.

Applications including warehouse management, re-stocking supermarkets, and package delivery have spurred research for indoor robotics, which extensively relies on visual sensors (cameras and LiDARs). To cater to these applications indoor robotics use simultaneous localization and mapping (SLAM) systems, wherein these visual sensors work in tandem with on-board odometry or IMU sensors. However, this broad spectrum of indoor applications brings unforeseen challenges for on-board visual sensors.

### Technology

Researchers from UC San Diego have developed a technology that integrates WiFi as a sensor to simultaneously locate the robot and Map the WiFi access point (APs) in the environment. The invention allows for any WiFi receiver and transmitter to be repurposed to be used for localization purposes for a robot. The invention makes use of both WiFi access points deployed in the environment and one deployed on the robot to get accurate location of the robot in large spaces.

Simultaneous localization and mapping (SLAM) is the computational problem of constructing or updating a map of an unknown environment while simultaneously keeping track of an agent's location within it.

## APPLICATIONS

indoor robotics

## INTELLECTUAL PROPERTY INFO

UC San Diego has protected patent rights in this technology and is seeking companies interested in developing commercial uses.

## RELATED MATERIALS

## CONTACT

Skip Cynar  
[scynar@ucsd.edu](mailto:scynar@ucsd.edu)  
tel: 858-822-2672.



## OTHER INFORMATION

### KEYWORDS

WiFi, simultaneous localization and mapping, SLAM, robotics, wireless sensing

### CATEGORIZED AS

- **Communications**
- Wireless

### RELATED CASES

2021-Z08-1

**University of California, San Diego**  
**Office of Innovation and Commercialization**  
9500 Gilman Drive, MC 0910, ,  
La Jolla, CA 92093-0910

Tel: 858.534.5815  
innovation@ucsd.edu  
<https://innovation.ucsd.edu>  
Fax: 858.534.7345

© 2023, The Regents of the  
University of California  
[Terms of use](#)  
[Privacy Notice](#)