DRIEI
PhD Program in Electronic and Computer Engineering
University of Cagliari, Italy

Course:	**Wi-Fi device tracking in heterogeneous wireless networks**
Instructor:	Matteo Anedda
SSD:	Ex: ING-INF/03 – Communications
Credits / hours:	2.5 credits / 20 hours
Language:	Italian
Scheduling:	I semester, Jan-Feb
Final Exam:	Project
Website:	https://sites.unica.it/net4u/2022/05/02/wi-fi-device-tracking-in-heterogeneous-wireless-networks/

Goal of the Course

The course aims to introduce the sniffing techniques of Wi-Fi devices in indoor and outdoor environments, and the data management techniques for tracking people and objects within the area of interest. The monitoring of devices has become a crucial aspect in the context of Smart Cities because it allows the optimization of the services offered according to the higher or lower concentration of people and vehicles. In this course, the student will learn how to employ hardware and software to apply sniffing techniques, and the management of detected data for the construction of origin/destination matrices. In addition, the sensed data will be sent to a Social IoT platform via Low Power Wide Area Networks using compatible LoRa modules.

Prerequisites

Wireless communications and wireless sensor networks

Intersection with other courses at the University of Cagliari

None

Course Outline

Topic 1: Wi-Fi standard (8 hours)

- Introduction;
- Sniffing approaches;
- Experimental test;

Topic 2: Tracking modeling (8 hours)

- Tracking models;
- Emerging modeling approaches;

- Experimental test;

Topic 3: Data transmission and management (4 hours)

- LoRa approaches;
- Data management approaches.