





## Università degli Studi di Napoli Federico II Dottorato di ricerca / PhD program in Information Technology and Electrical Engineering

## Module Title: Cooperative and Non Cooperative Localization Systems

#### Lecturer:

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**CV:** Massimo Rosamilia received the B.S. (Hons.) and M.S. degrees in computer engineering from the University of Salerno, Fisciano, Italy, in 2017 and 2019, respectively, and the Ph.D. degree (cum laude) in information technologies and electrical engineering from the University of Naples Federico II, Naples, Italy, in 2023. He is currently an assistant professor (RTDa) with the University of Naples Federico II. His research interests include statistical signal processing with applications to radar detection and estimation problems.



The course is framed in the context of RESTART project, spoke 7, under the Italian National Recovery and Resilience Plan (NRRP) of NextGenerationEU, partnership on "Telecommunications of the Future" (PE00000001 - program "RESTART").



## Credits: 3

### Overview

The course provides an overview about radiofrequency cooperative and non-cooperative localization systems. The first part introduces basic concepts on radar systems and a variety of applications leveraging radar technology. The second part provides the working principles of diverse radiolocatization techniques and presents fundamental issues on the satellite navigation systems. The third and last part is focused on two important practical systems: the Secondary Surveillance Radar (SSR) for air traffic control and the Automatic Identification Systems (AIS) for maritime localization.







# Schedule

Lecture	Date	Time	Room	Topics
1	09/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Introduction to Radar Systems. Basic Definition. Taxonomy of Radar Systems. Doppler Effect. Resolution and Radar Measurements.
2	11/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Radar Functions: Search, Track and Imaging. Mechanical versus Electronic Scanning. Radar Applications.
3	16/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Introduction to radiolocalization techniques: DOA, TOA, and TDOA strategies. Basic concepts of navigation satellite systems.
4	18/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	GPS system architecture: space segment, control segment, and user segment. Navigation message description. GPS receiver functionalities.
5	20/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Secondary Surveillance Radar (SSR) system for air traffic control.
6	23/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Automatic Identification System (AIS) system for maritime traffic control
7	27/06/2025	15-17	Aula Riunioni (2nd building, ground floor)	Exercises and assessment test

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