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

Lecturers:

Prof. Augusto Aubry

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CV: *Augusto Aubry received the Dr. Eng. degree in telecommunication engineering (with honors) and the Ph.D. degree in electronic and telecommunication engineering both from the University of Naples Federico II, Naples, Italy, in 2007 and 2011, respectively. He is currently under research agreement with the Department of Electrical and Information Technology Engineering, University of Naples Federico II. His research interests include statistical signal processing and optimization theory, with emphasis on MIMO communications and radar signal processing.*

Dr. Vincenzo Carotenuto

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CV: *Vincenzo Carotenuto received the M.Sc. degree in telecommunication engineering and the Ph.D. degree in electronic and telecommunication engineering from the University of Naples Federico II, Naples, Italy, in 2010 and 2015, respectively. He is currently under research agreement with the Department of Electrical and Information Technology Engineering, University of Naples Federico II. His research interest lies in the field of statistical signal processing, with an emphasis on radar signal processing.*

Prof. Antonio De Maio

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CV: *Antonio De Maio received the Dr. Eng. (Hons.) and Ph.D. degrees in information engineering from the University of Naples Federico II, Naples, Italy, in 1998 and 2002, respectively. He is currently a Professor with the University of Naples Federico II. His research interest lies in the field of statistical signal processing, with emphasis on radar detection, optimization theory applied to radar signal processing, and multipleaccess communications.*
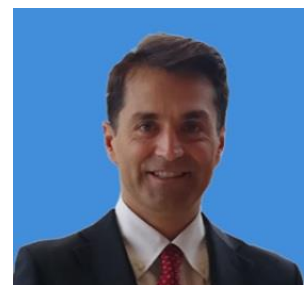
Credits: 3

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	Topics	Lecturer
1	24/03/2022	10:30-12:30	Introduction to Radar Systems. Basic Definition. Taxonomy of Radar Systems. Doppler Effect. Resolution and Radar Measurements.	A. De Maio
2	31/03/2022	08:30-10:30	Radar Functions: Search, Track and Imaging. Mechanical versus Electronic Scanning. Radar Applications.	A. De Maio
3	11/04/2022	16:00-18:00	Secondary Surveillance Radar (SSR) system for air traffic control.	V. Carotenuto
4	12/04/2022	16:00-18:00	Automatic Identification System (AIS) system for maritime traffic control.	V. Carotenuto
5	21/04/2022	16:00-18:00	Introduction to radiolocalization techniques: DOA, TOA, and TDOA strategies. Basic concepts of navigation satellite systems. Position, velocity, and time determination via pseudo-range measurements.	A. Aubry
6	22/04/2022	16:00-18:00	GPS system architecture: space segment, control segment, and user segment. Navigation message description. GPS receiver functionalities.	A. Aubry
	TBD	TBD	Assessment test	

Online lectures are provided via Microsoft Teams
Team Code: **cb3xx93**

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