UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

DOTTORATO DI RICERCA / PHD PROGRAM IN
INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING

Module Title: **Sonar Systems**

Lecturers: **Prof. Antonio De Maio, Prof. Augusto Aubry, Dr. Massimo Rosamilia**

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 includes statistical signal processing, with emphasis on radar detection, optimization theory applied to radar signal processing, and multiple-access communications.*

CV: *Augusto Aubry received the Dr.Eng. (Hons.) degree in telecommunication engineering and the Ph.D. degree in electronic and telecommunication engineering from the University of Naples Federico II, Naples, Italy, in 2007 and 2011, respectively. He is currently an Associate Professor with the University of Naples Federico II. His research interests include statistical signal processing and optimization theory, with emphasis on MIMO communications and radar signal processing.*

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.*

Overview

The aims of this course are to provide an understanding of the basic principles of sonar and to show formulae and rules of thumb for sonar design and performance analysis. The following topics will be covered: Introduction to SONAR. Sound propagation in water and simulations. Noise and Reverberation in SONAR. SONAR equations. SONAR signals & processing. Sonar sensor arrays & processing. Underwater Localization.

Credits: 3

Schedule

Lecture	Date	Time	Topics	Lecturer
1	23/01/2026	9.00-13:00	Introduction to SONAR. Sound propagation in water. Noise and Reverberation in SONAR. Simulations.	A. De Maio, M. Rosamilia
2	26/01/2026	9.00-13:00	SONAR equations. SONAR signals & processing.	A. De Maio, A. Aubry
3	27/01/2026	9.00-12:00	Sonar sensor arrays & processing. Underwater Localization.	A. Aubry, M. Rosamilia
4	27/01/2026	12:00-13:00	Assessment test	M. Rosamilia

Lectures will be delivered in-class. Further information will be provided as it becomes available.

For information:
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