

**Ph.D. in Information Technology  
Thesis Defense**

**February 19<sup>th</sup>, 2025**

**At 10:00 a.m.**

**Aula Seminari Alessandra Alario, Edificio 21**

**Stefano MORO** – XXXVII Cycle

**ENHANCING SEARCH AND RESCUE CAPABILITIES THROUGH INTEGRATED  
SENSING AND COMMUNICATION FOR UNMANNED AERIAL VEHICLES**

Supervisor: Prof. Maurizio Magarini

**Abstract:**

How can drones help locate avalanche victims faster? Can communication signals be repurposed for radar imaging? My PhD research explores how Unmanned Aerial Vehicles (UAVs) equipped with Integrated Sensing and Communication (ISAC) systems can revolutionize Search and Rescue (SAR) operations.

Modern rescue missions face strict constraints on power, bandwidth, and environmental conditions, making it challenging to locate individuals quickly and accurately. My work demonstrates how standard wireless communication signals—such as those used in mobile networks—can be leveraged for high-resolution radar imaging and precise localization, even in harsh conditions like deep snow and rugged terrains.

By combining advanced signal processing techniques with UAV-based sensing, this research paves the way for faster and more efficient rescue operations, reducing search times and ultimately saving lives.

**PhD Committee**

Prof. Michele D'Amico, **Politecnico di Milano**

Prof. Othmar Frey, **ETH Zurich**

Prof. Fabiola Colone, **Università degli Studi di Roma, “La Sapienza”**