

# **SEMINAR ANNOUNCEMENT**

Monday June 9<sup>th</sup>, 2025 at 03:00 pm Room "Sala Seminari" Abacus Building (U14)

# Toward Zero-Shot Camera-to-LiDAR Matching for Generalizable Robotic Localization

## Speaker Daniele Cattaneo

Research Group Leader at the Robot Learning Lab, University of Freiburg, Germany

### Abstract

Enabling mobile robots to safely and efficiently navigate in previously unseen dynamic environments is a longstanding challenge in robotics. While advances in AI and deep learning have transformed many fields, their application to real-world robotic localization is still limited by the need for environment- and embodiment-specific training.

To bridge this gap, there is a pressing need for learning-based localization methods that can seamlessly transfer across different robots and environments.

In this talk, I will present my work on camera-to-LiDAR matching. By combining deep learning with traditional optimization techniques, the proposed method is independent of sensor-specific parameters, generalizable, and can be deployed in the wild for monocular localization in LiDAR maps and camera-LiDAR extrinsic calibration.

Evaluations on three in-house robots demonstrate that the method effectively generalizes to previously unseen environments and sensor setups in a zero-shot manner.

#### Short Bio

Daniele Cattaneo received the M.Sc. degree in Computer Science from the University of Milano-Bicocca in 2016, and the Ph.D. degree in Computer Science from the same university in 2020. He is currently a Research Group Leader at the Robot Learning Lab, University of Freiburg, Germany. His research focuses on advancing Al-based methodologies for robotic perception and state estimation, with an emphasis on developing models capable of evolving and adapting to different robotic platforms, unseen environments, and novel object