PhD program on Autonomous Systems (DAuSy)

Curriculum C3 – Autonomous Systems for Monitoring and Security

Call 2023

PhD project: Management and automation systems for energy management in buildings and industrial processes

Reference University: Università degli Studi di Cagliari

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Workplace:

- Department of Electrical and Electronic Engineering, via Marengo 2, Cagliari.
- Stam offices, Open Campus, Località Sa Illetta, Strada Statale 195 Sulcitana, Cagliari.
- Foreign University to be defined.

Project synthetic description:

The framework for the proposed thesis is part of ongoing projects at the industrial partner, funded either by private companies or public agencies, as well as at the Department of Electrical and Electronic Engineering, funded by the PNRR.

The aim of the project is the study and development of tools for the energy management of the use of energy either in a civil contest or in industrial settlements. The full exploitation of renewable energy sources should be achieved by distributed control and optimization algorithms, possibly considering the specific characteristics of the users and producers connected in the network.

The role of explicit or implicit energy storage systems, e.g., batteries and building structures respectively, will be considered in the optimization procedures as well as the knowledge of behavioural and meteorological forecasts. To this aim, models of the single user or producer will be analysed and developed by means of both physical modelling and data-based approaches.

The design of the energy management and optimization system should be versatile enough to adapt to the monitoring, security, and automation level of the building or of the industrial activity, depending on the specific application.

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Type of scholarship:

DM 117/2023 – Project on PNRR (Italy's Recovery and Resilience Plan)