

## MACHINE LEARNING FOR POWER SYSTEMS

### ORGANIZED BY

• **Alice La Fata**  
Electrical, Electronics and Telecommunication Engineering  
and Naval Architecture Department, University of Genoa, Italy

In the last decades, electric power systems are facing significant changes. Specifically, nowadays generation is leading the operation paradigm of power systems, since the penetration of intermittent Renewable Energy Sources (RES) causes fluctuations that may affect security and stability. Therefore, new solutions and technologies are needed to improve the planning and operation phases of microgrids and production plants. Additionally, in recent years, electricity markets are evolving, to fully optimize the use of interconnectors, national surpluses and deficits, providing support services against supply - demand imbalances. Within this framework, in recent years, many research activities have started exploiting the abilities of data-driven approaches in these fields. Indeed, Machine Learning (ML) based models may result to be extremely useful for predictive modeling of, as instance, energy generation, load requirements and electricity market forecasts. This Special Session aims at providing comprehensive coverage on state-of-the-art methods based on ML applications in power systems.

Authors are requested to submit papers on (but not limited to) the following topics:

- ML algorithms to forecast power generation from RES
- ML models to mitigate RES induced fluctuations in power systems
- ML predictive models for load requirements and demand side optimization (e.g., programmable loads)
- Applications of ML, Internet of Things (IoT) and big data for energy efficiency
- Electricity market price prediction using ML algorithms
- ML algorithms to optimize bidding strategies in energy markets
- ML models to optimally manage Battery Energy Storage Systems
- ML models to enhance the optimization computed by energy management systems
- ML algorithms to enhance the performance of transmission and distribution networks (e.g., network reconfiguration, fault detection).