

AI model for Load Prediction in Part of Electricity Distribution Network

Challenge Introduction

Smart grids represent a transformative approach to modernizing the electricity distribution grid. By integrating renewable energy sources such as solar and wind power, smart grids enhance the sustainability and resilience of the energy system. Grid flexibility allows for better management of energy flows, adapting to the variable nature of renewable sources and ensuring a reliable supply.

Effective network modelling is crucial for smart grids, as it helps predict and manage load variations, optimize infrastructure investments, and improve the planning and construction of the grid. This leads to more efficient and cost-effective operations, ultimately contributing to a more sustainable and reliable energy future.

Who is behind the initiative?

PREdistribuce, a.s. (PREdi) is the owner and operator of the distribution system in Prague, capital city of Czech Republic. The main mission is to provide a reliable and safe supply of electrical energy to all its customers. Due to the growing demands for continuity and the quality of electricity supply as well as growing share of new technologies such as electromobility, smart metering or accumulation, the company aims to ensure well in advance readiness of the distribution system for the arrival of modern energy trends. PREdi proudly embraces the principles of sustainable development and through its projects, it strives to contribute to the improvement of the standards of living in the region it operates in.



PRE Contacts

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What is the challenge and project objectives ?

This challenge has a major benefit from the perspective of sustainability and the integration of renewable energy sources. Predicting the load on the distribution grid using AI enables more efficient management of energy flows and higher utilization of renewable sources such as solar and wind power plants. In this way, it is possible to contribute to the development of a more sustainable energy infrastructure that is better able to respond to the variable nature of renewable sources and reduce dependence on fossil fuels.

Interested student teams are asked to engage in the above area by

- Developing and training an AI model that will be able to predict the load on a part of the distribution network based on the consumption and production profiles of typical consumers and prosumers
- Student teams will test the predictive capabilities of their AI models for a specific street under various conditions, such as sunny and cloudy days

Expectations and relevant considerations for the challenge / theme

Providing practical experience with the application of AI in the energy sector, better understanding of energy consumption dynamics in distribution networks and an innovative approach to planning, managing, and optimizing the operation of a smart grid, which is essential for improving its efficiency, reliability and sustainability.

