DALE - Swissgrid Data Lab

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Swissgrid Data Lab project description

New challenges for Swissgrid

Increasingly decentral and fluctuating

Challenges
- Precise forecasts
- Coordination among market players
- Complex grid planning and maintenance
- Slow grid expansion

Requires intelligent use of resources

Digitalisation as a solution

- Reduction in costs for storage space and computing
- New sensors/IoT

More system information stored digitally

The Swissgrid Data Lab is the central platform for the analysis of data

R&D project period: Jan 2020–Feb 2021

Partners: d-fine, Microsoft

Procedure:

1. Designing of a digital work environment in the area of data science[1]
2. Potential analysis of cloud computing resources for data science in the context of an ETHZ master's thesis on the topic of «Node Setpoint Load Forecast»

[1]Data science as an all-encompassing term here for: grid modelling, simulations, forecasting models, optimisation problems, etc.

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Abstract – Swissgrid Data Lab project

Initial situation

Digitalisation and the intelligent use of the existing infrastructure poses a challenge for transmission system operators, on the one hand, but also opens up new opportunities for the flexible operation of the electricity system of the future, on the other hand. Cloud service providers offer flexible infrastructures, managed software and platforms, and they also enable smaller organisations to develop data-intensive applications in a short period of time and to operate them cost-effectively.

Question

The focus is on the question of how business decisions can be accelerated with the help of modern data analyses.

Procedure

1. Creation of a target concept for an attractive work environment for data scientists, termed the Swissgrid Data Lab
2. Creation of a rough concept for the Swissgrid Data Lab
3. Discussion of the subject with at least three European TSOs
4. Review and benchmarking of the concept by a leading consultant in data analytics
5. Resistance testing of the concept with a deep learning prototype of node setpoint stochastic load forecasting with real grid data from the cloud computing platform of Microsoft Azure.

Methods applied

Implementation of a so-called variational autoencoder based on technology components provided in the Swissgrid Data Lab.

Expected benefit

Shorter development times for data-intensive applications in system operation and asset management, as technically experienced data scientists are provided with a workspace that enables them to work with modern tools, programming languages and frameworks.

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