Description

Videos: Forecasting and Control - Towards Digital Grids

Get updated on the state of the art methods for Energy Systems Integration in these videos with Professor Henrik Madsen from DTU Compute – the section for Dynamical Systems. The videos are made in collaboration with EIT InnoEnergy at the university KU Leuven in Belgium.

Get an introduction to forecasting methods – and learn about digitization of the grids and energy markets. Find all the references at the homepage for CITIES - Centre for IT-Intelligent Energy Systems – under the topic: Energy System Operation: https://smart-cities-centre.org/topics/energy-system-operation/

Abstracts

Lesson 1 – 2 – 3: State of the art of forecasting
Lesson 1: Introduction to renewable energy forecasting: (MET input, data, adaptivety, combined forecasting, etc.), 7:38 min. https://youtu.be/RZi5RjDKAH0
Lesson 2: Point forecasts of wind and solar power production: (with a focus on wind and solar energy production), 7:10 min. https://youtu.be/0IiVgpELtjM
Lesson 3: Probabilistic and full stochastic forecasting, 6:51 min. https://youtu.be/Z-E_TDLIx8c

Lesson 4 – 5 – 6: Digitization of the grids and energy markets
Lesson 4: The challenges of the climate crisis and the integration of renewables, 11:34 min. https://youtu.be/Pjyv49LaKMc
Lesson 5: Unlocking end-user flexibility: (description of flexibility, use of flexibility for, demand response etc.), 10:01 min. https://youtu.be/vn94ODtst5U
Lesson 6: Data-intelligent operation of future smart energy systems, 8:24 min. https://youtu.be/AR5F77dTgJw

References:

- Personal website: https://henrikmadsen.org/courses/
- Time Series Analysis, chapter 10 (lesson 2)
- Reference [3] (lesson 2)
- Reference [4] (lesson 2)
- Reference [6] (lesson 3)
- Reference [8] (lesson 3)

Models:

- Bex-Jenkins (lesson 1)
- ARMA (lesson 1)

- Holt-Winter (lesson 1)

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Glossary:

- Quantile (lesson 3)

Exercises:

Lesson 3

- Exercise about penalty function/percentiles.