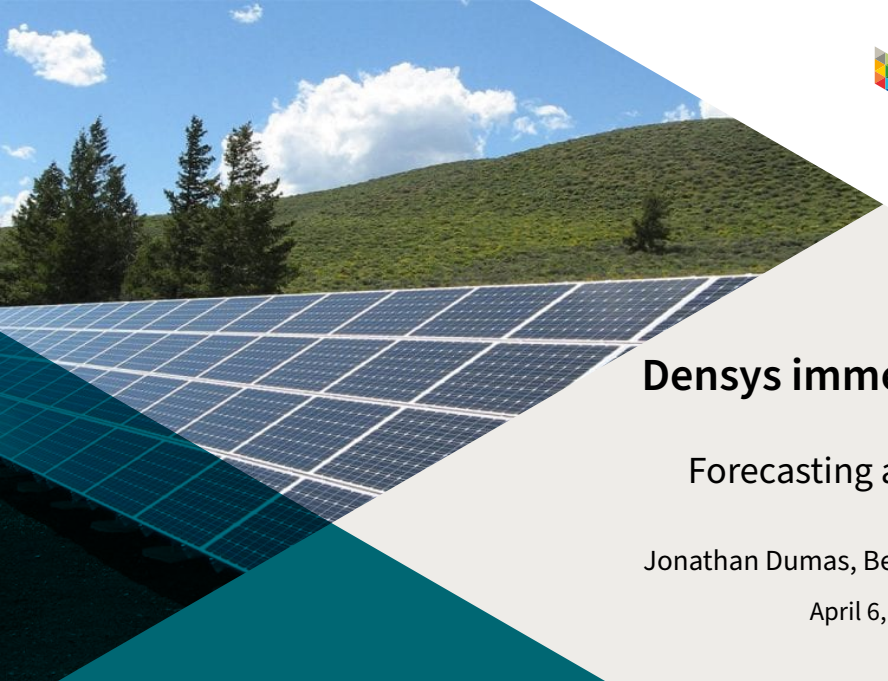

LIÈGE université
Sciences Appliquées

Densys immersive week

Forecasting assignment

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Learning objectives

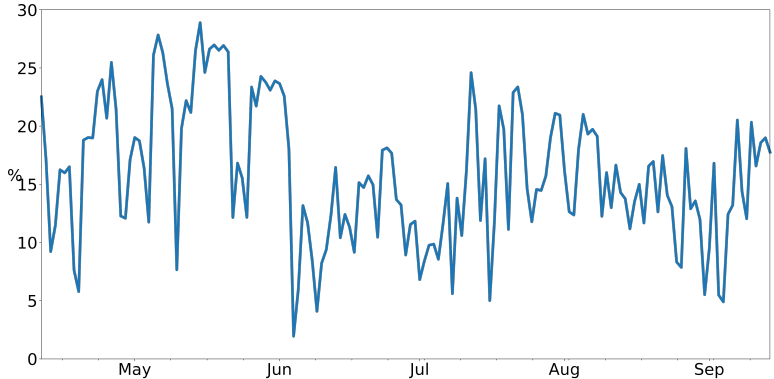
Through this assignment, it is aimed for the students to be able to:

- Produce point forecasts;
- Perform verification of point forecasts

Case study: PV parking rooftops from Liège university

PV installation of 466.4 kWp

Daily energy per day of the dataset



The daily energy PV generation is normalized by the daily energy produced by the total installed capacity ($466.4 \times 24kWh$).

Dataset inspection

- Plot the PV generation observations.
- Plot the weather forecasts: irradiance and air temperature.
- Use the file `data_inspection.py`.

Point forecasts I

1. Implement a persistent model to be used as a benchmark: D-1 = D in the file `persistance_model_TODO.py`.
2. Implement a linear regression model from the Python sci-kit-learn library in the file `MLR_point_TODO.py`.
3. Implement a Gradient Boosting Regressor (GBR) from the Python sci-kit learn library in the file `GBR_point_TODO.py`.
4. Try to optimize the GBR hyper-parameters.
5. Perform the visual inspection of point forecasts and compute scores. Comment on the results. You can use `score_comparison.py`.

Point forecasts II

6. Change the random parameter to build a new pair of learning and testing sets. How do the scores behave? Comment on the results. WARNING: at this stage, you cannot change the GBR hyper-parameters selected at point 4.
7. Discuss the validation strategy. Would it be possible to adopt another strategy? What would be the pros and cons?

Rules for assignment completion and submission

1. Write a short report (max four pages, 11pt font).
2. When submitting your report, please indicate the names of the group's students on the report title page.
3. Send your report and code in a zip archive to Bertrand Cornélusse.