

SEST 2020

3rd International Conference on Smart Energy Systems and Technologies (SEST)

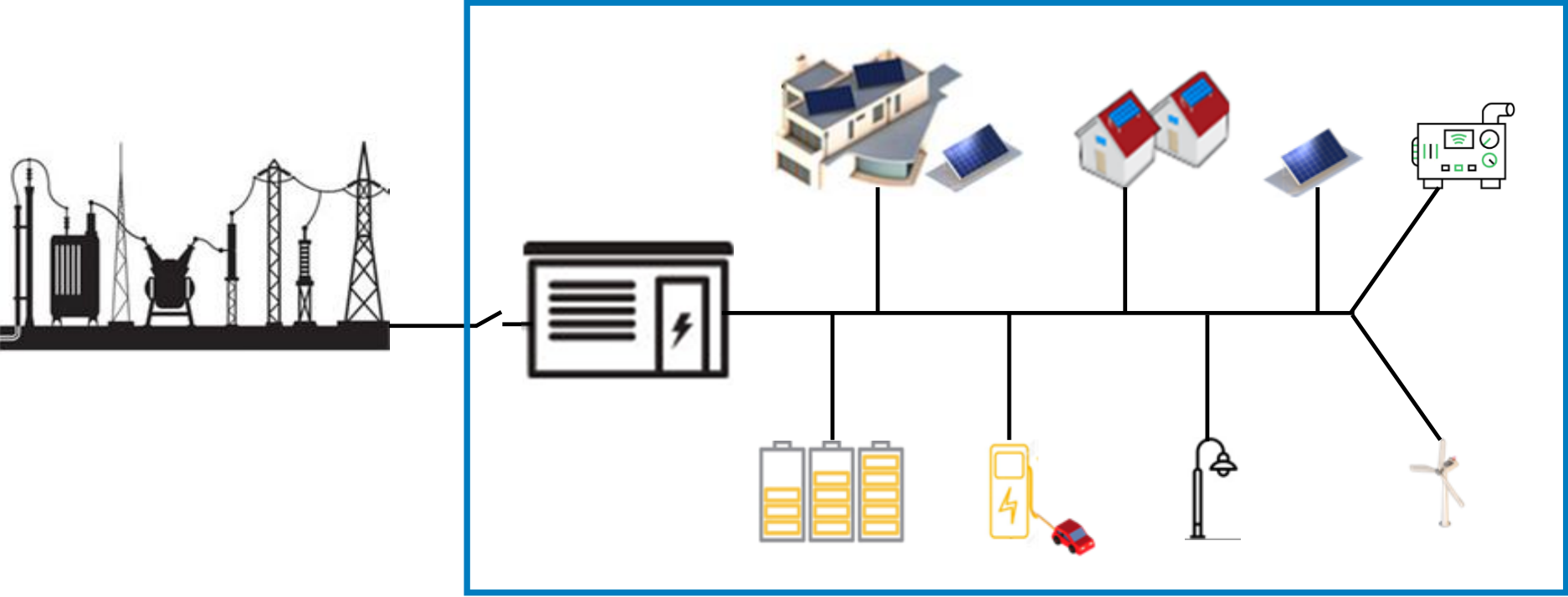
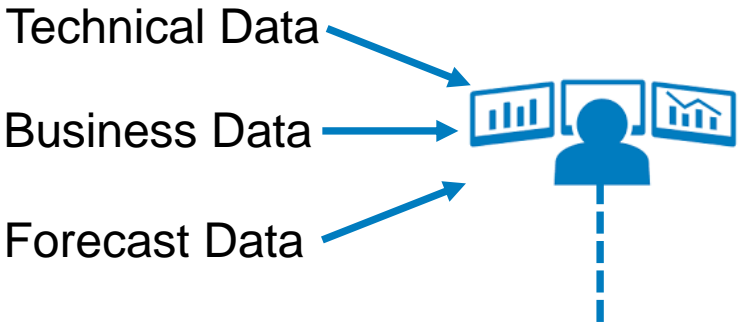
7-9 September 2020, Istanbul, Turkey

Paper No: 233

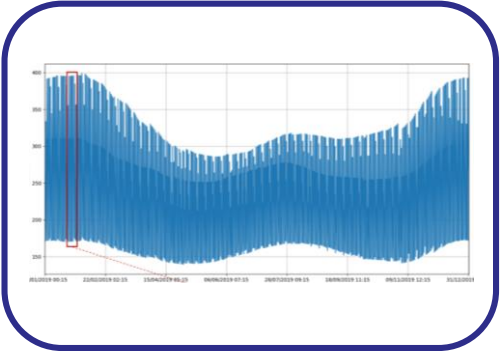
A Hybrid Approach to Load Forecast at a Micro Grid level through Machine Learning Algorithms

**Tiago Guimarães, Luís Costa,
Helder Leite, Luís Azevedo**

Background and Motivation



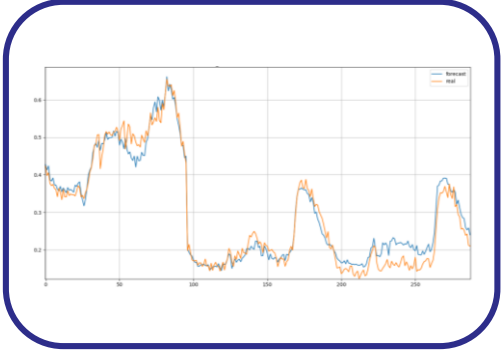
Background and Motivation



- Historical Data

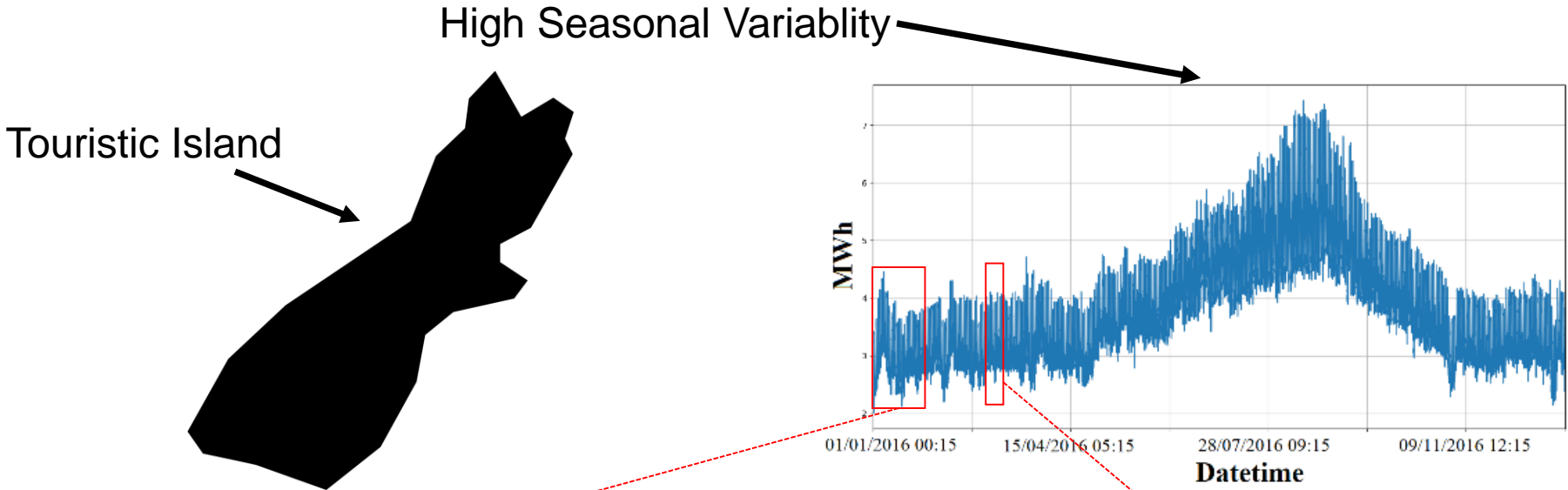


- AI Model Training

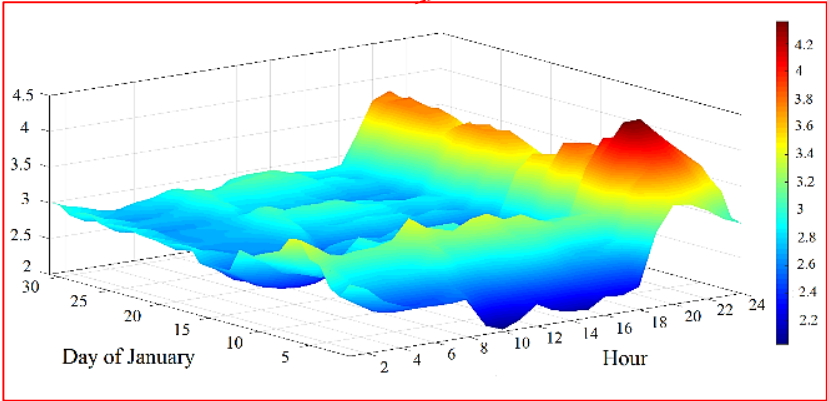


- Time-series Forecast

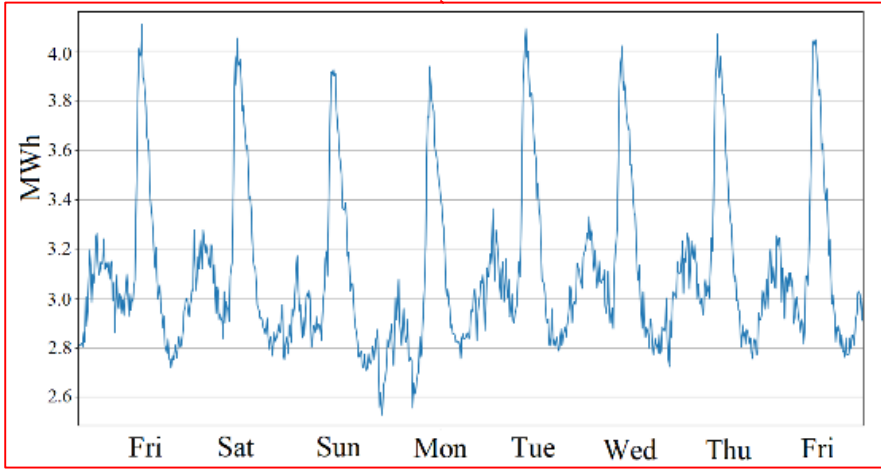
Background and Motivation



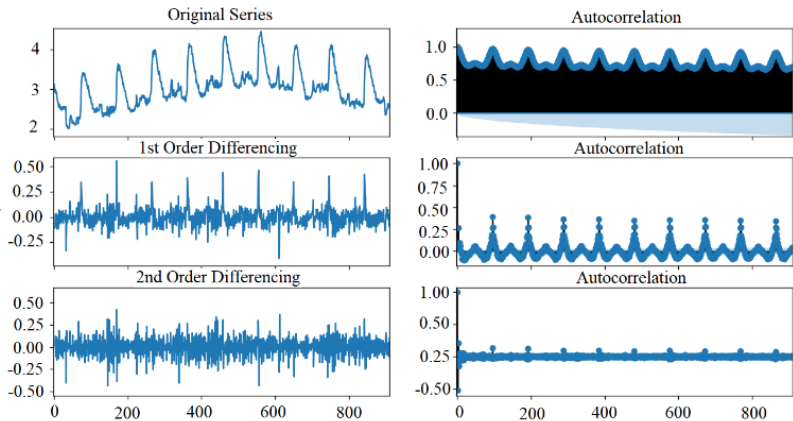
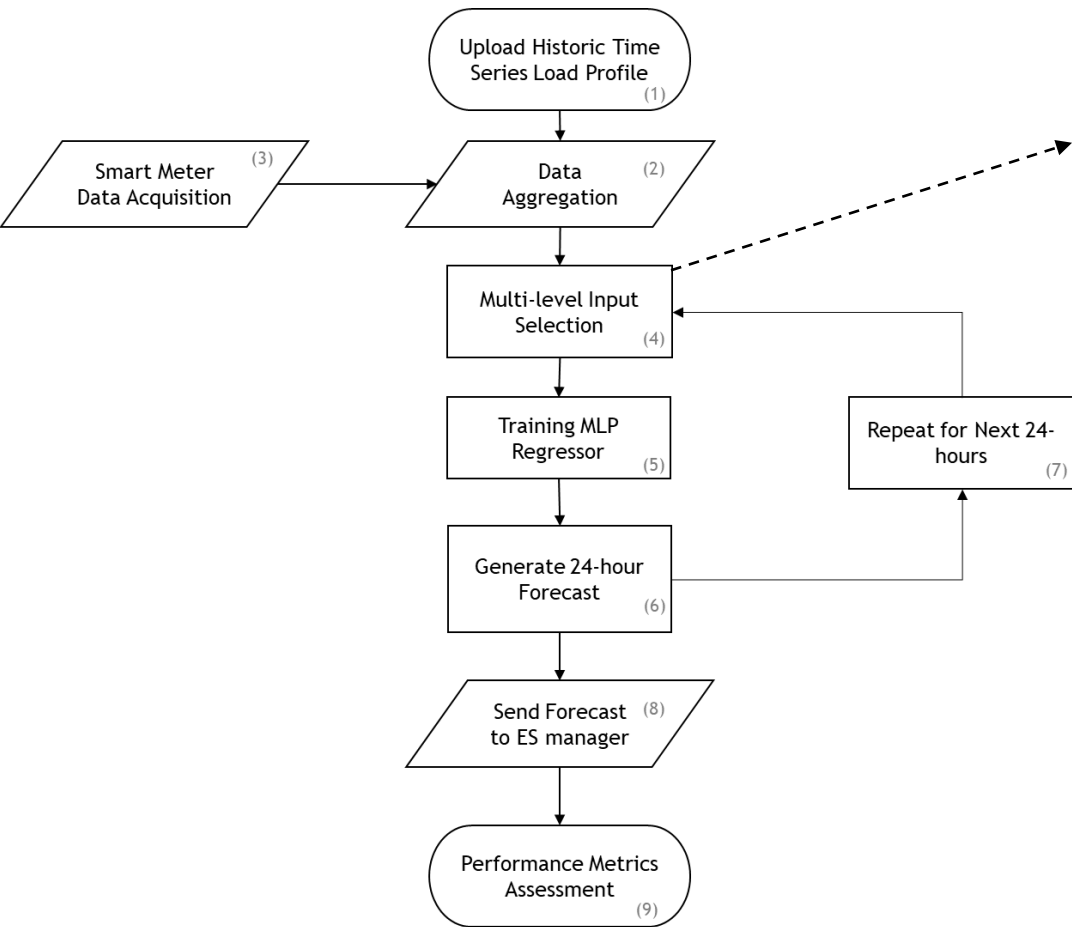
Full year of electric load data.



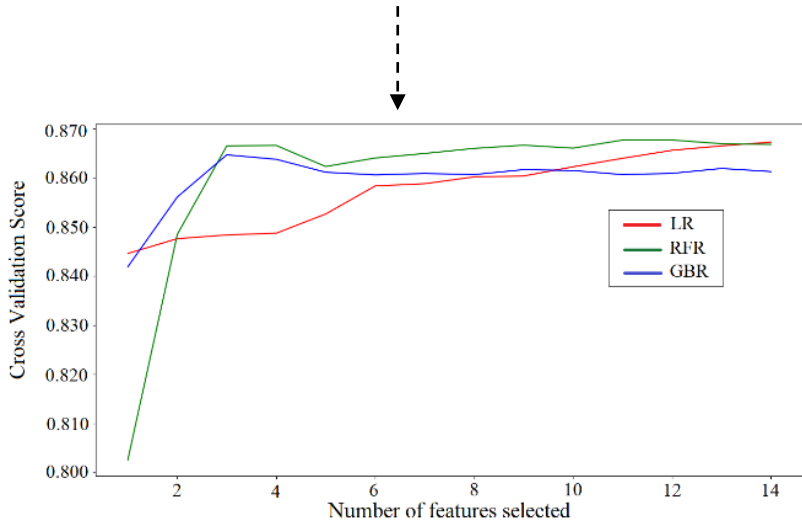
3D hourly modeling of January 2016.



Results and Discussion

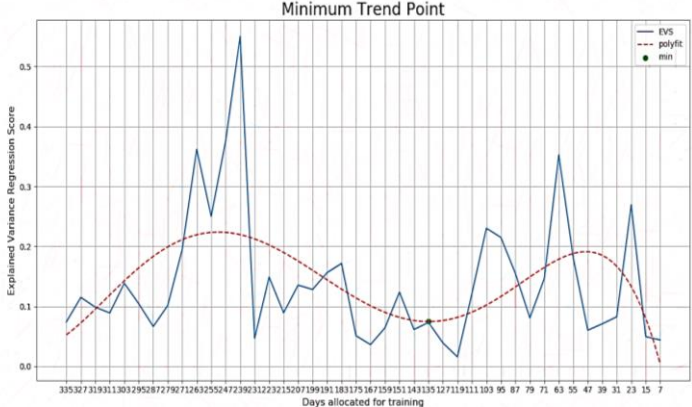
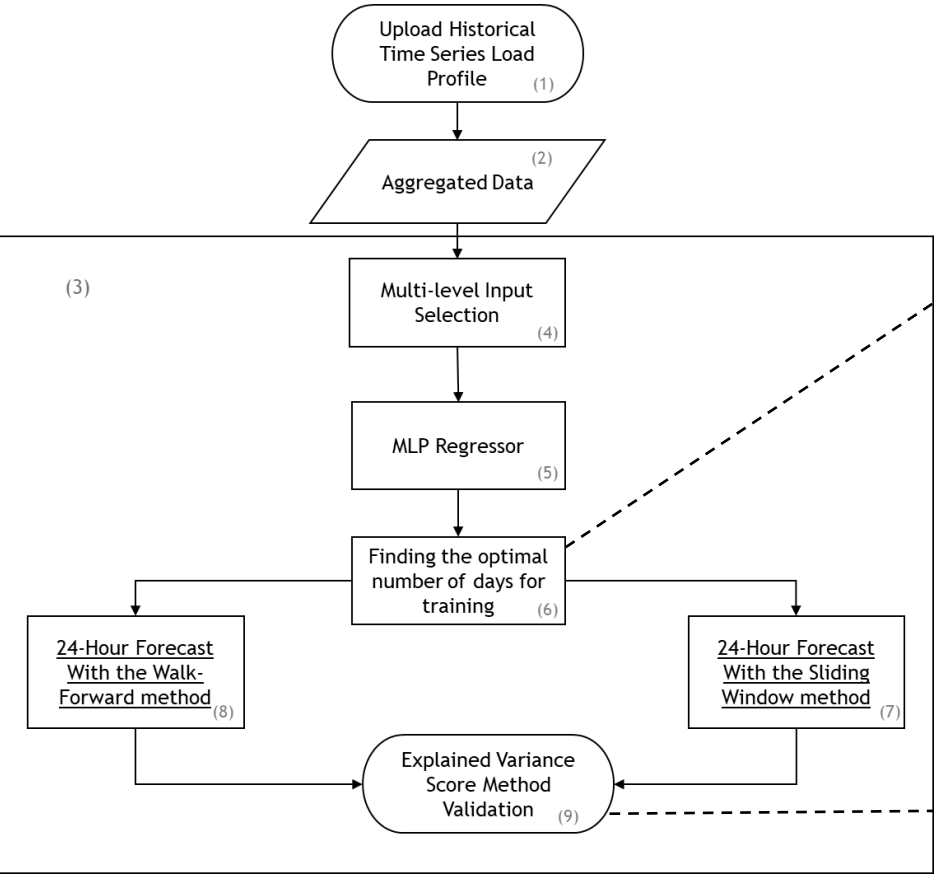


Time Series Differencing and respective Autocorrelation.

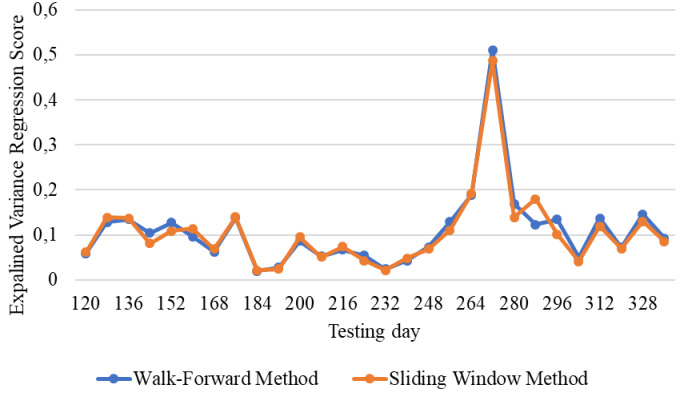


Recursive Feature Elimination results with 3 different estimators.

Results and Discussion



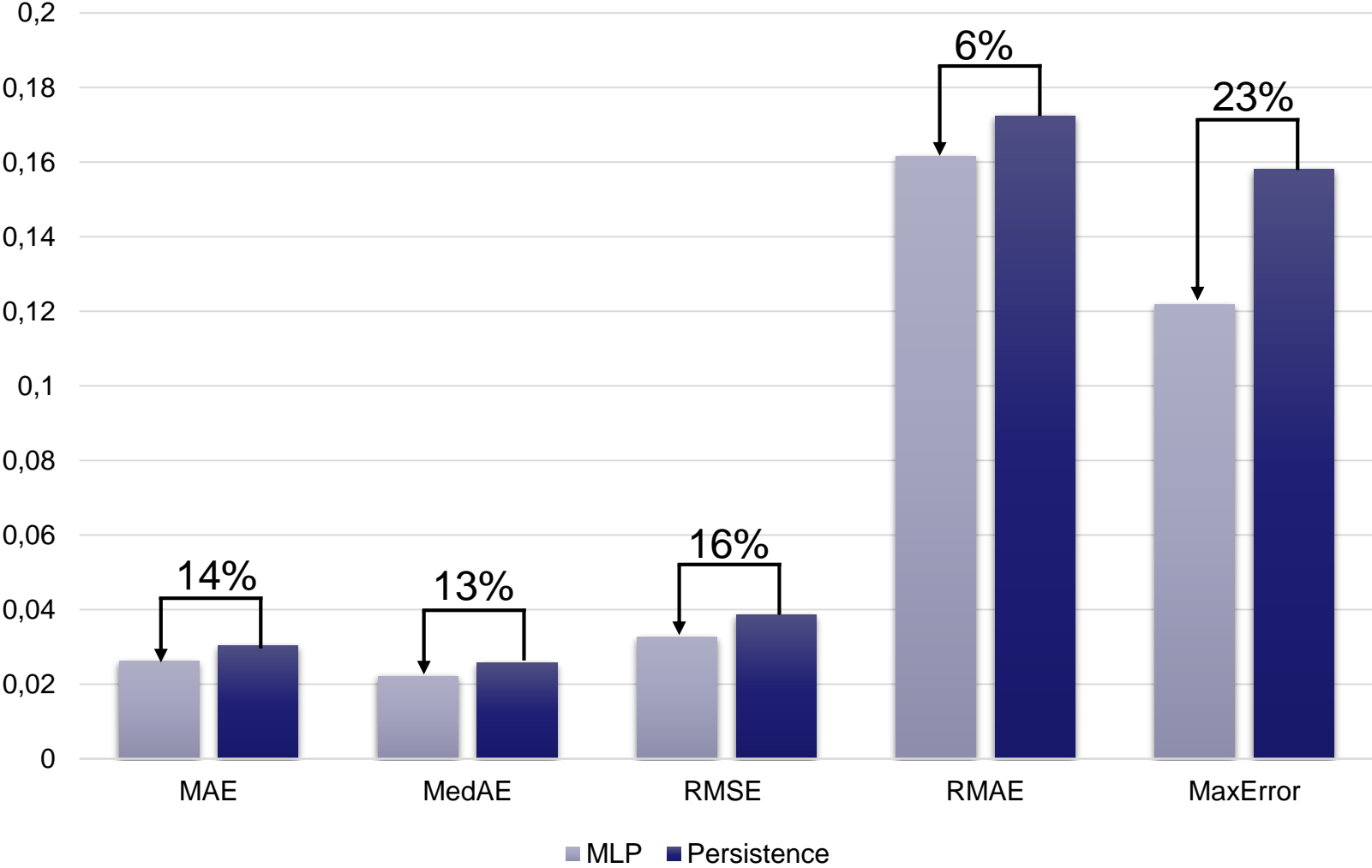
Method to discover the number of training days.



Explained Variance Regression Score method comparison.

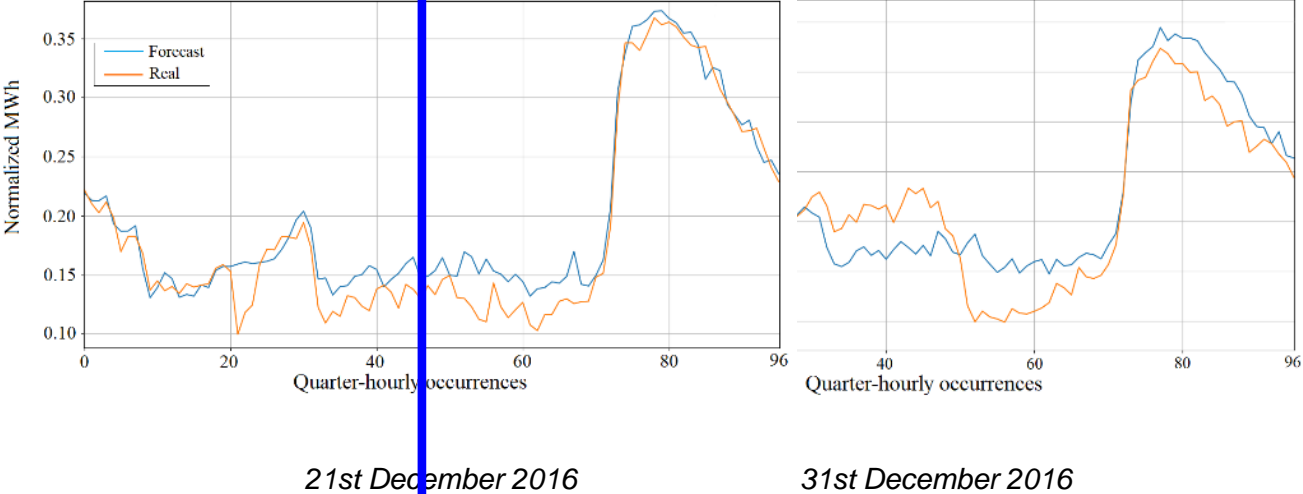
26% of improvement on computational time with the Sliding Window method.

Results and Discussion



Results and Discussion

Typical days $\rightarrow R^2 \approx 94\%$ Atypical days $\rightarrow R^2 \approx 83\%$



R^2 is the proportion of the variance in the dependent variable that is predictable from the independent variable.

Conclusions

