Time Series Forecasting with Machine Learning & Deep Learning

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Introduction

In the last 15 years, business requests related to time series forecasting changed dramatically. Business needs evolved from predicting at most 100, low frequency (mainly monthly or quarterly) data, to forecasting 10.000, high frequency (mainly daily data) time series. Unfortunately, the classical tools that were highly used in the past years may not be the best anymore, both in terms of accuracy and computationally.
Moreover, the review of M-Series Forecasting Competitions suggests that newer ML and DL models, or stacking ensemble techniques may be very accurate compared to easier solutions.

For these reasons, nowadays the "time series forecasting" data scientist is required to be capable of providing business forecasting solutions tackling both scalability and accuracy, constantly keeping up-to-date with new methods.

Course Structure

The aim of the course is to teach the students how time series forecasting problems can be solved in practice. The state-of-the-art techniques are presented from a very practical point of view, throughout R tutorials on each main topic. Python algorithms are also presented and used within R by means of the *reticulate* package. Theoretical concepts are left to those who are interested in and bibliographic references are listed at the end of the course.

Contents

- Time Series Manipulations, Transformations & Visualizations
- Time Series Features Engineering
- Time Series Models
- Machine Learning Models
- Deep Learning Models
- Automatic Machine Learning
- Hyperparameter Tuning
- Ensemble Learning
- Recursivity of ML Models
- Nested (Iterative) Forecasting
- Global Modelling

Specific business needs may be discussed during the lectures.

Duration

The course has a duration of 20 hours.

Beneficiaries

This course is intended for data scientist, data analyst, statisticians, IT specialists, developers, project managers and business leaders who want to develop the most in-demand skills to solve time series forecasting problems.

Requirements

Basic statistic and programming knowledge.