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Sequential Aggregation of Heterogeneous Experts for PM10 Forecasting

Topic 2 – Learning more from what we already know

Introduction

We experiment some methods of sequential aggregation for forecasting PM10 concentrations for the next day, in the context of air quality monitoring in Normandy (France). Besides the field of application and the adaptation to the special context of the work of the forecaster, the main originality of this paper is that the set of experts contains at the same time statistical models built by means of various methods and groups of predictors, as well as experts coming from deterministic chemical models of prediction modeling pollution, weather and atmosphere.

Numerical results on recent data from April 2013 until March 2015, on the whole network of fifteen monitoring stations, illustrate and compare some various methods of aggregation. The obtained results show that such a strategy clearly improves the performances of the best expert both in terms of prediction errors and in terms of alerts.

What is more, it reaches, for the non-convex weighting strategy, the "unbiasedness" of observed-forecasted scatterplot, extremely difficult to obtain.