Multimodal Meta-learning for Time Series Forecasting

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Abstract

Time series forecasting has been traditionally done with statistical models, which sometimes perform nearly as good as deep learning models (Smyl, 2020). On the other hand, RNNs sometimes need a lot of data to be able to generalize, however, in some cases, the time series are not long enough to be able to learn patterns. Therefore, it is important to make use of information across time series to improve learning. Some transfer learning techniques have been applied successfully, showing that parameters initialization can be shared among time series to increase the accuracy. Recently, meta-learning has been proposed to find better initialization for the parameters of the models (Finn et al., 2017). However, a study of meta-learning in the context of time-series forecasting is lacking. In this master thesis, we will explore the idea of using meta-learning for quickly adapting model parameters to new short-history time series. We propose, moreover, the idea of conditioning some parameters of the model to an auxiliary network which encodes global information by using some ideas from the multi-modal meta-learning (Vuorio et. al, 2019). Finally, we apply the data to time series of different domains, such as finance and electrical battery data.

References

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