Multimodal Meta-learning for Time Series Regression

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January 2021

Abstract

Recent work has shown the efficiency of deep learning models such as Fully Convolutional Networks or Recurrent Neural Networks (RNN) to deal with Time Series Regression problems. These models sometimes need a lot of data to be able to generalize, yet 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. In this context, 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 regression 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 pollution and electrical battery data.

References

Vuorio, Risto Sun, Shao-Hua Hu, Hexiang Lim, Joseph. (2019). *Multimodal Model-Agnostic Meta-Learning via Task-Aware Modulation.*

Finn, C., Abbeel, P., Levine, S. (2017). *Model-agnostic meta-learning for fast adaptation of deep networks.* arXiv preprint arXiv:1703.03400.