Online Variational Inference for Gaussian Processes and Deep Neural Networks

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Abstract

Gaussian Processes and Bayesian Neural Networks are two Bayesian models that have gained importance in the machine learning community. Modern algorithms to train these models make use of variational inference and recent developments in stochastic optimization, which allow the models to be trained on large datasets. In this talk, I will discuss new algorithms for learning these models in the online learning setting. In particular, I will focus on online variational inference algorithms for learning sparse Gaussian Processes from streaming data, as well as for learning Bayesian Neural Networks in the continual learning scenario. These algorithms allow us to re-use previous models and adapt them to new data without re-training them from scratch. I will also evaluate the performance of these algorithms on some real-world datasets.