Título: Bayesian spatio-temporal wind speed.

Data: 30/08/2022

Horário: 14h00

Local: Videoconferência: https://meet.google.com/vpw-gnnq-bju

Resumo:

Short and long term wind speed time series prediction is very useful for industry, specially for wind generation power plants, having several practical application on wind farm's daily

operation. The results of wind speed forecasting are even more powerful and trustful when associated to uncertainty estimates, bringing a much higher support to decision making. A potential totally data-driven model for this task is done through Machine Learning and Deep Neural Networks. The extraction of uncertainty estimates associated to the predictive distribution can be done through a Bayesian approach applied to deep neural networks. In the context of Neural Networks and Deep Learning, the traditional Bayesian approach becomes intractable and computationally expensive, due to the huge amount of parameters involved. However, there were several recent goals regarding approximate Bayesian inference in deep neural networks, with many methods being presented and evaluated, some of them very simple and applicable even on pre-trained models. This work proposes a spatio-temporal model for wind speed forecasts in a wind farm in the south of Brazil, which uses the measurements of data acquisition systems located at the turbine itself and commonly usedglobal weather forecasting models, extracting uncertainty estimates through Bayesian approximation techniques for neural networks, and comparing some of these methods using probabilistic methods. The experiments evaluated show us that the use of recurrent neural networks, along with deep ensembles technique, yields good results for the predictive distribution and can be used in a practical context in wind farms.

Banca examinadora:

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