

Towards Black-box Parameter Estimation

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As soon as we move away from Gaussian processes as the canonical model for dependent data, likelihood computation becomes effectively impossible, and inference is too complicated for traditional estimation methods. Consider, for instance, datasets from finance or climate science, where skewness and jumps are commonly present, and calculating the likelihood in closed form is often impossible, even with small datasets.

Recently, deep learning algorithms have shown to be a successful alternative in estimating parameters of statistical models for which simulation is easy, but likelihood computation is challenging. This talk presents new developments in black-box procedures to estimate parameters of statistical models based only on weak parameter structure assumptions. These approaches can successfully estimate and quantify the uncertainty of parameters from non-Gaussian models with complex spatial and temporal dependencies. The success of these methods is a first step towards a fully flexible automatic black-box estimation framework.