Contribution ID: **86** Type: **not specified**

Bayesian Optimisation under system drift

The classical approach to DoE, as shaped by Fisher, now reaches back almost 100 years. Bayesian optimisation, or “active learning”, is now often presented as a more modern alternative. As an iterative method, it selects each new experimental run based on the information currently available. This means that randomisation, which is one of the central aspects in “classical” DoE, is inherently impossible. This becomes problematic in the presence of a system drift, i.e. a trend in the measurements over time.
Using simulated data with varying degrees of system drift (and different noise levels), we assess how the two approaches behave under such non-ideal conditions. Can these effects safely be ignored or do they present a genuine problem?

Special/ Invited session

Classification

Mainly methodology

Keywords

Bayesian Optimisation, Design of Experiments, System Drift

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Track Classification: Design of Experiments