

Levelset Estimation by Bayesian Optimization

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A common goal in reinterpretations is the determination of iso-hyper-surfaces with constant values of e.g. a likelihood, a test statistic such as CLs (for example, in two dimensions the iso-surface is the contour $CLs=0.05$). Traditionally cartesian grids are used in two dimensions but the cost of generating Monte Carlo Events for each point makes this approach prohibitive in higher dimensions.

We present a iterative algorithm based on Bayesian Optimization and Gaussian Process that samples the parameter space by continuously incorporating information of evaluations from prior points in parameter space to determine the optimal next point to evaluate (e.g. generate Monte Carlo events for) and present results significant savings in computational resources.

Presentation

Talk given in person

Authors: HEINRICH, Lukas Alexander (New York University (US)); LOUPPE, Gilles (New York University (US)); CRANMER, Kyle Stuart (New York University (US))

Presenter: HEINRICH, Lukas Alexander (New York University (US))

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