Domain-Aware Gaussian Processes and High-Performance Mathematical Optimization for Stochastic Function Approximation and Autonomous Data Acquisition*

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Abstract

Gaussian Processes and Gaussian-Process-Related stochastic processes have been shown to be powerful tools for stochastic function approximation and autonomous control of data acquisition due to their robustness, analytical tractability, and natural inclusion of uncertainty quantification. In this talk, I want to present our work on a general, flexible, and powerful GP-driven framework for autonomous data acquisition. The focus of this work lies on making Gaussian (related) processes more flexible and domain aware, how the added flexibility and domain-awareness can be used for decision-making, and the computational and mathematical challenges that come with these advancements.

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