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Algorithm Switching for Multiobjective Energy Modeling and Predictions

Thursday, August 15, 2024 12:00 PM (30 minutes)

This talk explores the application of multi-objective optimization in the field of renewable energy, focusing on both classification and regression tasks driven by machine learning. We consider multiple objectives, including accuracy, computational efficiency, algorithmic bias, and model sparsity. Models can be comprehensive, ranging from complex decision trees and neural networks to simple KNN-type settings. Multi-objective derivative-free optimization has utilized Bayesian and direct-search methods individually in the past. In this work, we introduce a novel switching framework that integrates both methods iteratively. Additionally, we propose a warm-start training methodology tailored for machine learning problems, which effectively deploys the problem structure. We evaluate our proposed method by comparing it against traditional Bayesian and Direct-Search approaches using multiple real-world datasets and machine learning models. We observe a significant improvement in numerical performance with the joint switching-based scheme.

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