MATH+ Spotlight Talk
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Multiobjective Learning in Solar Energy Prediction: Benefits and Algorithms

Abstract:

While the space of renewable energy forecasting (marked by imbalanced data) has received significant attention in the last decade, literature has primarily focused on machine learning models that train on only one objective at a time. Say, to balance reserves, it is natural for market regulators to have a choice to be more/less averse to false negatives than to false positives (operational costs vs shortfall). Besides accuracy, other metrics like algorithmic bias, RMBE (in regression problems), inference time, and model sparsity are also very crucial. This work is one of the firsts in the field of renewable energy forecasting that attempts to present a Pareto frontier of solutions (trade-offs in handling multiple objectives). Our proposed algorithm relies on using a sequence of weighted (uniform meshes) single objective model training routines. Preliminary results from real-world data examples (Univ. of Amherst dataset) show promising advantage over single objective methods.