school of computing, informatics, & decision systems engineering

IE Decision Systems Engineering Fall '19 Seminar Series

Friday, November 15th | 12PM |BYENG 510

"Grey-box Bayesian Optimization"

Peter Frazier
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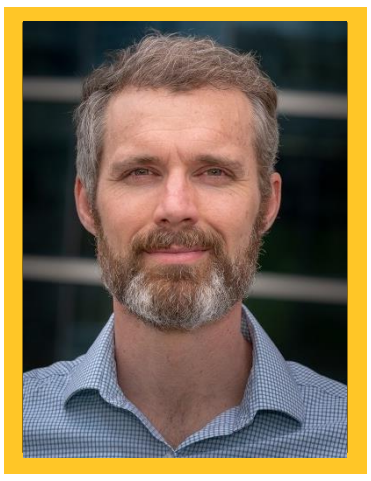

Abstract

Bayesian optimization is a powerful tool for optimizing time-consuming-to-evaluate non-convex derivative-free objective functions. While BayesOpt has historically been deployed as a black-box optimizer, recent advances show considerable gains by "peeking inside the box". For example, when tuning hyperparameters in deep neural networks to minimize validation error, state-of-the-art BayesOpt tuning methods leverage the ability to stop training early, restart previously paused training, perform training and testing on a strict subset of the available data, and warm-start from previously tuned network architectures. We describe new "grey box" Bayesian optimization methods that selectively exploit problem structure to deliver state-of-the-art performance. We then describe applications of these methods to tuning deep neural networks, inverse reinforcement learning and calibrating physics-based simulators to observational data.

Biography

Peter Frazier is an Associate Professor in the School of Operations Research and Information Engineering at Cornell University and a Staff Data Scientist at Uber. His academic research is on Bayesian optimization, multi-armed bandits, and reinforcement learning with applications in e-commerce, the sharing economy and materials design. At Uber, he managed UberPool's data science group, designed the route-based pricing portion of Uber's pricing system, and currently works on features that increase drivers' flexibility and control. He is the recipient of an AFOSR Young Investigator Award, an NSF CAREER Award, and best paper awards from the ACM Conference on Economics and Computation, Winter Simulation Conference, and the INFORMS Computing Society.

Hosted by: Giulia Pederielli

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