Practical Two-Step Lookahead Bayesian Optimization

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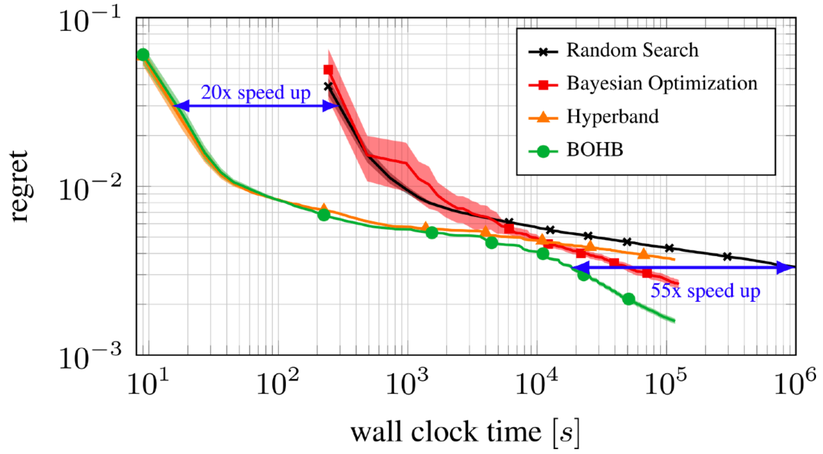
Poster #33, Th 10:45am

BayesOpt is a powerful black-box optimizer



AutoML

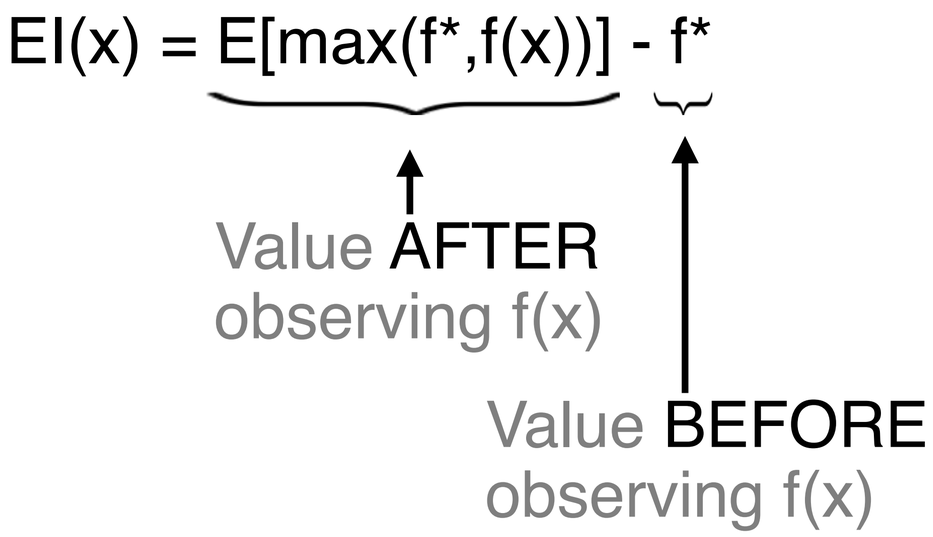
[automl.org]

Policy Search in Robotics

[Tesch, Schneider, Choset 2011]

Product Improvement with A/B testing

[botorch.org]



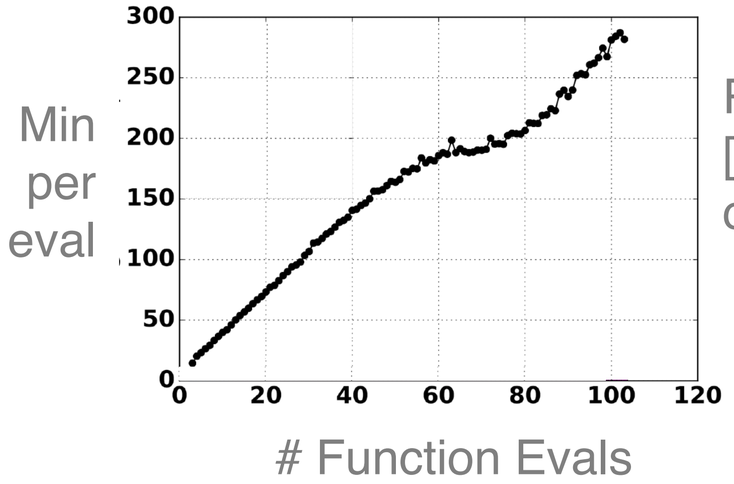
Classic BayesOpt looks only one step ahead

In THEORY:

- it's better to look multiple steps ahead

In PRACTICE:

- It's slow



Runtime of GLASSES [Gonzales et al. 2016] on 10-d Rosenbrock

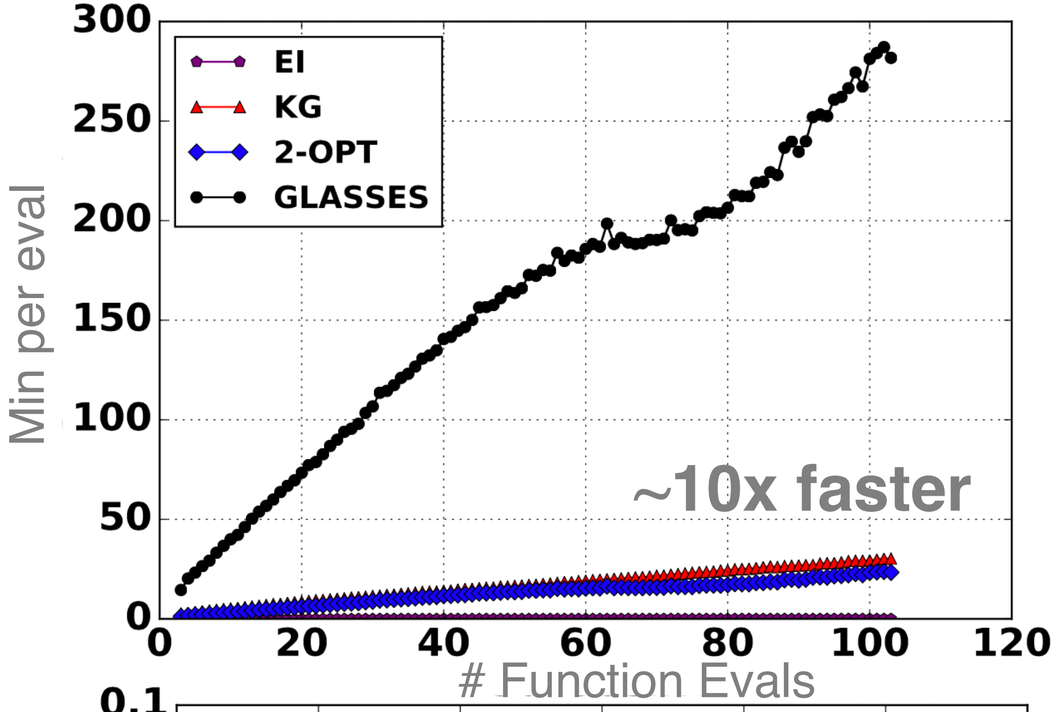
- Approximation errors erase most of the benefit

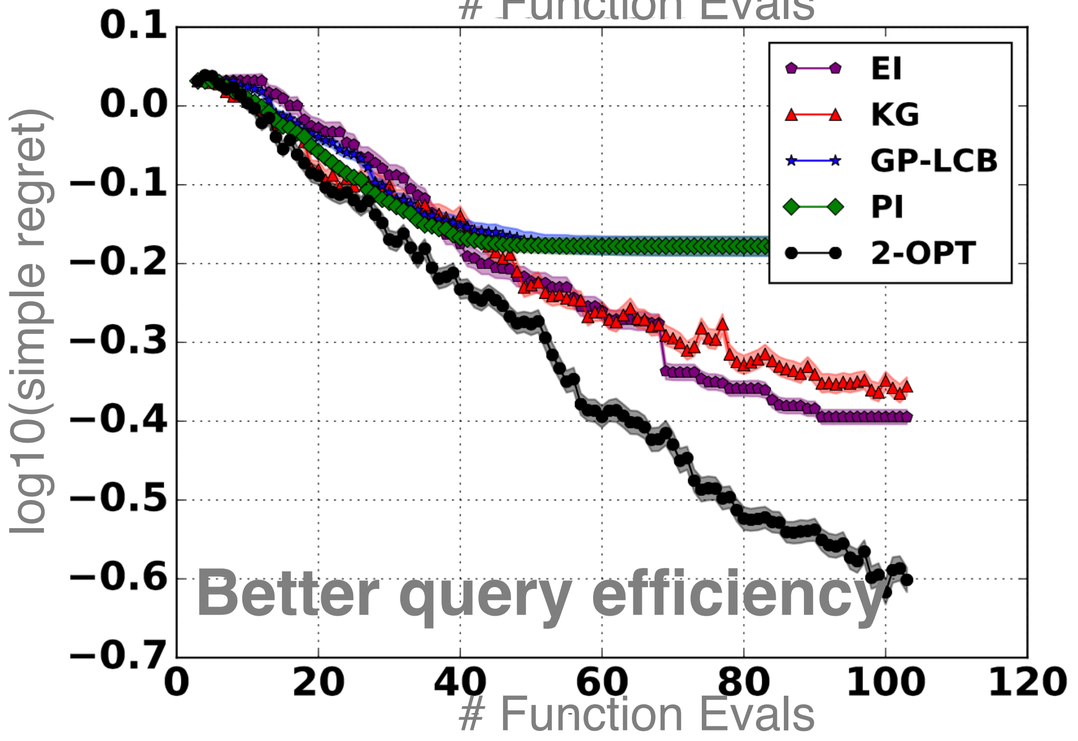
Our Contribution

A new algorithm that efficiently & accurately optimizes the **two-step lookahead** acquisition function.

It provides:

- **Better query efficiency** than 1-step and previous multi-step methods
- **Batch** evaluations
- **~10x faster** than previous multi-step methods (usually seconds to at most several minutes per batch)





Check out our poster!
#33, Th 10:45-12:45