July 27 - July 31 Seminar Review

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Title: Sampling and RCD: what does random coordinate descent do in sampling?
Presenter: Qin Li

This talk introduces the application of Random Coordinate Descent (RCD) in the Bayesian sampling problem. First, the presenter compares the Bayesian sampling problem ~~versus~~ the optimization problem. The output of optimization is a single minimizer, while the output of sampling is a point cloud, which makes sampling harder than optimization. However, Bayesian sampling is still an extended version of optimization, and optimization tools may be applicable for sampling. Second, the presenter introduces an optimization tool, RCD. Similar to Stochastic Gradient Descent (SGD), RCD randomly selects a partial derivative as the descent direction in each iteration to fasten the convergence and reduce the complexity. RCD converges slightly slower than SGD, but RCD costs less than SGD, particularly when the dimension is large. Last, the presenter applies the RCD to the sampling problem and shows the ~~significance~~ of the sampling-RCD method ~~than~~ traditional sampling methods.

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with
improvement
over
(we reserve the word ``significance'' for statistical significance, i.e., statements involving p-values.)