

# July 27 - July 31 Seminar Review

Jiixin Hu

July 31, 2020

## 1 7.27 IFDS

**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.