psd

DISSERTATION PROPOSAL PRESENTATION

Two Problems in Statistical Learning and Inference

WHEN
December 1st, 2021
3:00 PM, CST

WHERE
Via ZOOM
ZOOM information will be provided in the email announcement for this seminar.

Wanrong Zhu, PhD candidate

We discuss two problems in statistical learning and inference: inference for stochastic gradient descent (SGD) and goodness-of-fit (GoF) testing with approximately co-sufficient sampling (aCSS).

Gradient descent (SGD) and its variants, are workhorses of modern statistical and machine learning. In the first part of this talk, we investigate the statistical property of SGD. We first present asymptotic normality results for (weighted) averaged-SGD and propose an online approach for covariance matrix estimation. With the estimated covariance matrix, we can leverage the asymptotic normality results to build valid confidence regions for SGD solutions. We also conduct concentration analysis for SGD solutions with heavy tailed gradients noises.

In the second part of this talk, we discuss another fundamental problem: Goodness-of-fit (GoF) testing, which is ubiquitous in statistics. We focus on parametric null models with composite null hypothesis. We demonstrate how to build a valid testing that conditions on an approximately sufficient statistic. The method is powerful in the degenerate setting, and is also applicable when constraints appear on the parameter space, like sparsity and isotonic constraint.

stat.uchicago.edu

THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS