2023 62nd IEEE Conference on Decision and Control (CDC)
December 13-15, 2023. Marina Bay Sands, Singapore

A Tutorial on the Non-Asymptotic Theory of System Identification: Basic Concentration Inequalities

Abstract

In this talk we introduce the basic technical machinery - concentration inequalities- underlying much of modern statistical learning theory. We discuss how the Chernoff trick and notions such as sub-Gaussianity allow for a relatively satisfying non-asymptotic analogue to classical asymptotics. We conclude by introducing a more advanced concentration inequality, the Hanson-Wright inequality, which provides an estimate of the deviation of certain random quadratic forms. This inequality will be key in the following talks.

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