The Mismatch Principle

Can the Lasso Fit Arbitrary Observations?

Martin Genzel

Technische Universität Berlin
Institut für Mathematik

email: genzel@math.tu-berlin.de

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Abstract

In this talk, we study how the *generalized Lasso* performs on arbitrary observation models. While the Lasso was originally designed for (sparse) linear regression, it will turn out that it can in fact handle much more complicated scenarios, such as *single-index models* and *variable selection*. For this purpose, we will introduce a rigorous recovery framework that applies to fairly general problem situations. The key quantities of our approach are the so-called *mismatch parameters*, which allow us to precisely quantify the reliability of the estimated parameter vector. This eventually leads to the formulation of the *mismatch principle*, providing a simple guideline of how to prove recovery guarantees for the Lasso.