

The Mismatch Principle:

What Can the Lasso Learn About Non-Linear Observations?

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In this talk, we study how the *generalized Lasso* performs on *semi-parametric* 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 estimation 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 us to the formulation of the *mismatch principle*, providing a simple recipe to prove error bounds for the Lasso. This is joint work with Gitta Kutyniok.