The kernel tensor-product multi-level method

Author and Presenter: Rüdiger **Kempf** (University Bayreuth, Germany)

Co-author: Holger **Wendland** (University Bayreuth, Germany)

Abstract

In applications such as machine learning and uncertainty quantification, one of the main tasks is to reconstruct an unknown function from given data with data sites lying in a high dimensional domain. This task is usually even for relatively small domain dimensions numerically difficult.

We propose a new reconstruction scheme by combining the well-known kernel multi-level technique in low dimensional domains with the anisotropic Smolyak algorithm, which allows us to derive a high dimensional interpolation scheme. This new method has significantly lower complexity than traditional highdimensional interpolation schemes.

In this talk, I will give an introduction to the topics of kernel multi-level and anisotropic Smolyak algorithms before providing a convergence result for this new Kernel Tensor-Product Multi-Level method. If time permits, I will also give numerical examples.