

Approximation and Computation in High Dimensions

Professor Ronald DeVore

June 5, 2017

Fall 2017

MATH 664-601

Tuesday & Thursday

12:45pm - 2:00pm

Blocker Bldg. Room 160

One of the great challenges of numerical analysis is the recovery of functions that depend on several variables or parameters. Such functions occur in modeling complex physical systems and in analyzing big data. This course will treat various aspects of numerically recovering high dimensional functions. The first topic centers around the relevant model classes for which computation is possible. This includes models built on sparsity, anisotropy, and tensor formats. Then we will treat two common scenarios: recovery of the function from given data observations and designing good querying (measurement schemes) for high dimensional functions. Here we touch on ideas from compressed sensing, adaptivity, discrepancy theory, hashing, tensor formats, etc. The class will cover a lot of material not found in textbooks.