



QMC Opening Workshop
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Lecture: *Sequential Function Approximation in High Dimensions with Big Data*

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Abstract:

One of the central tasks in computational mathematics and statistics is to accurately approximate unknown target functions. This is typically done with the help of data samples of the unknown functions. The emergence of Big Data presents both opportunities and challenges. On one hand, big data introduces more information about the unknowns and, in principle, allows us to create more accurate models. On the other hand, data storage and processing become highly challenging. In this talk, we present a set of sequential algorithms for function approximation in high dimensions with large data sets. The algorithms are of iterative nature and involve only vector operations. They use one data sample at each step and can handle dynamic/stream data. We present both the numerical algorithms, which are easy to implement, as well as rigorous analysis for their theoretical foundation.