Optimal Sampling for Function Approximation

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We consider the approximation or recovery of functions based on a finite number of function evaluations (samples). This is a recurring problem in theoretical and applied mathematics, which has been studied for centuries. It is a main topic in optimal recovery, complexity theory, machine learning and numerical analysis. Nonetheless, many fundamental insights were obtained only recently. The aim of this talk is to discuss the theoretical approximation benchmark that appears because of the limited amount of available data, but also to consider practical sampling strategies and algorithms that come as close to the benchmark as possible.