

## Sampling strategies for approximation in kernel spaces

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Kernel methods provide powerful and flexible techniques to approximate functions defined on general domains, with possible high-dimensional input and output dimension, and using samples at scattered locations.

In this context, the problem of choosing the location of the sampling points is of great interest, both from a practical and a theoretical viewpoint. On one hand, it is of theoretical interest to know the limit and benefits of the choice of optimal point location, and to design feasible algorithms to select them. On the other hand, several applications are described by large datasets, and it may be interesting to select a possibly small portion of the data that allows an accurate reconstruction of the full problem.

In this talk we will discuss some greedy methods and show that they are effective techniques in both scenarios.

In particular, we will first introduce some results on the general structure and theory of kernel-based greedy methods, and describe their efficient implementation. We will then show that, in certain circumstances, they may be proven to be worst-case optimal.

We will focus mainly on interpolation, and mention some application to quadrature. Moreover, we will discuss the use of these techniques on some real world applications.