

1176-41-153

Prashant Shekhar*, shekharp@erau.edu, and **Abani Patra**. *Multiscale Models for Sparsity Constrained Data Reduction*.

Multiscale Models are known to be successful in uncovering and analyzing the structures in data at different resolutions. In this talk we focus on a particular feature driven Reproducing Kernel Hilbert Space (RKHS), for which the associated kernel has a weighted multiscale structure. For generating approximations in this space, we provide a practical forward-backward algorithm that uses a greedy approach to construct a set of multiscale basis functions. The spatial distribution of these functions also enable the selection of suitable sparse representations from the given data set, thus making representations and predictions very efficient. Targeting the problem of excessive number of hyperparameters in greedy algorithms, we will also present theoretical results and guidelines for determining the values of such hyperparameters in our approach. For demonstrating the performance of the algorithm, we consider a variety of remote sensing datasets, where besides providing a generalizable approximation model, the approach also achieves high levels of data reduction. (Received January 20, 2022)