

Feature augmentation and greedy extraction for data smoothing

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1 Abstract e references

The advent of Variably Scaled Kernels (VSKs) [2, 5] has led to formidable developments in the context of meshfree interpolation. Thanks to the use of a scaling function, they are able to realize feature augmentation by exploiting prior information on the approximation issue.

Recently we have investigated the VSK interpolation-based method for hard X-ray observations (visibilities) made of sampled Fourier components of the incoming photon flux of solar flares [6]. In collaboration with the MIDA group of the University of Genova, we have applied such approach

on real samples provided by the NASA system RHESSI, which is already dismissed, and by the *Spectrometer/Telescope for Imaging X-rays (STIX)* [1] mission on board *Solar Orbiter*, launched on February 10 2020, from Cape Canaveral.

Thanks to the versatility of the VSKs, the feature augmentation idea has been recently extended to other kinds of bases, specifically to splines [4]. The algorithm has been tested on real data from NMR spectroscopy. Furthermore, with the main scope of data selection for improving the performances of smoothing splines, preliminary results (joint work with R. Campagna, S. De Marchi and G. Santin) concern the introduction of greedy algorithms for a particular exponential smoothing spline [3], suitable in case of multi exponential decay data.

References

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