Empowering Multidimensional Data-Driven Metamodels: the doubly sparse Proper Generalized Decomposition (PGD) and the regularized sparse PGD

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ABSTRACT

Current data-driven techniques give suitable results when large amount of data is available. However, many industrial applications are out of the scope of the ideal context to use these techniques because of issues such as the curse of dimensionality or the expensiveness of data. In fact, data-driven modelling or metamodelling are especially difficult in the low-data context and when dealing with functions living in high dimensional spaces.

Normally, under these circumstances, overfitting is quickly reached without achieving the desired out-of-sample performance.

Therefore, solutions to this issue must be developed, pointing to the aim of obtaining the data-driven model with the best accuracy in the scarce-data limit.

To do that, we present two novel techniques based on the sPGD (sparse Proper Generalized Decomposition) framework \cite{1}\cite{2}\cite{3} to significantly improve accuracy, performance and sparse identification ability of the constructed model.

REFERENCES

