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## Reduction in parameter space with non linear active subspaces

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Dimension reduction techniques confer benefits to parametric studies in a great number of engineering applications. Active subspaces proposed by Trent Russi and developed by Paul Constantine have proven to be a versatile method in this matter for models with an underneath linear trend. Some efforts are directed to possible non-linear extensions. The turning point may come from machine learning non-linear supervised dimensionality reduction theory with a focus on supervised kernel principal component analysis and its randomized variant with Random Fourier Features. As testing ground for these possible improvements we present some test cases involving hypersurfaces of revolution with different generatrices.

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