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SPEAKER/ABSTRACT

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"Gradient-Free Construction of Active Subspaces for Dimension Reduction"

Abstract:
Recent developments in the field of reduced order modeling - and in particular, active subspace construction - have made it possible to efficiently approximate complex models by constructing low-order response surfaces based upon a small subspace of the original high dimensional parameter space. These methods rely upon the fact that the response tends to vary more prominently in a few dominant directions defined by linear combinations of the original inputs, allowing for a rotation of the coordinate axis and a consequent transformation of the parameters. In this talk, we discuss a gradient free active subspace algorithm that is feasible for high dimensional parameter spaces where finite-difference techniques are impractical. We illustrate an initialized gradient-free active subspace algorithm for a neutronics example implemented with SCALE6.1.