Global activity scores

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We present a generalization of the active subspace method called "global active subspace method", and its corresponding sensitivity measure called "global activity scores". The new methods are based on the expectation of finite-differences of the underlying function, as opposed to the gradient information in the active subspace method. We will present theoretical and numerical results showing the advantages of the new methods. In particular, we will present numerical examples where we compare the results of the global sensitivity analysis of some models using Sobol' sensitivity indices, derivative-based sensitivity measures, activity scores, and global activity scores. The numerical results reveal the scenarios when the global activity score has advantages over derivative-based sensitivity measures and activity scores, and when the three measures give similar results..

References:

[1] Ruilong Yue, Giray Ökten, "The Global Active Subspace Method", *arXiv:2304.14142*, 2023.

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