SEMINARIO
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On one dimensional weighted Poincare inequalities for Global Sensitivity Analysis

Abstract: Global Sensitivity Analysis (GSA) seeks to quantify the influence of input variables on the output of an expensive multivariate function. Among the sensitivity indices commonly used to quantify uncertainty, Sobol indices are often preferred in practice for their high interpretability. However, they are computationally expensive to estimate. Recently, one-dimensional Poincaré inequalities have been applied to provide cost-efficient upper bounds and approximations of Sobol indices. As a new contribution, we have developed the use of one-dimensional weighted Poincaré inequalities. The introduction of weights adds an extra degree of freedom to improve the accuracy of both the upper bounds and the approximations. We illustrate the benefits of using weights in GSA through an application to a real-world flooding model.

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