Conformal Approach To Gaussian Process Surrogate Evaluation With Coverage Guarantees

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Abstract

Gaussian processes (GPs) are a Bayesian machine learning approach widely used to construct surrogate models for the uncertainty quantification of computer simulation codes in industrial applications. It provides both a mean predictor and an estimate of the posterior prediction variance, the latter being used to produce Bayesian credibility intervals. Interpreting these intervals relies on the Gaussianity of the simulation model as well as the well-specification of the priors which are not always appropriate. We propose to address this issue with the help of conformal prediction. In the present work, a method for building adaptive cross-conformal prediction intervals is proposed by weighting the non-conformity score

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