An Efficient Gaussian Process Model for Computer Experiments with Tensor Output

Xinwei Deng

Department of Statistics, Virginia Institute of Technology, USA

Abstract

Computer experiments with complex input has drawn great attention in many applications. In this work, we consider an efficient model for analyzing data from computer experiments with tensor output. By investigating the tensor unfolding and high-order singular value decomposition (SVD), we establish a connection between high-order SVD and the SVD of the tensor unfolding. Using such a connection, we develop an efficient SVD-based Gaussian process model for computer experiments with tensor outputs. The performance of the proposed method is evaluated by both simulation and real case studies.