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CPS Paper

High-dimensional Partially Linear Additive Models on Lie groups

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Brief Description

We propose an extension of the partially linear additive model on Lie groups, such as the space of symmetric positive-definite matrices with the Log-Euclidean or Log-Cholesky metrics, and develop a semiparametric regression approach on Lie groups.

Moreover, we investigate two different high-dimensional regression methods for the linear components.

Our methods use profiling techniques to estimate the components.

We show that the proposed variable selection method has selection consistency and the estimators of parametric components have the oracle property.

Also, our nonparametric estimators achieve the convergence rate of univariate nonparametric models.

We provide several simulation studies and real data analysis to evaluate the numerical performance of the proposed methods.

Abstract

We propose an extension of the partially linear additive model on Lie groups, such as the space of symmetric positive-definite matrices with the Log-Euclidean or Log-Cholesky metrics, and develop a semiparametric regression approach on Lie groups. Moreover, we investigate two different high-dimensional regression methods for the linear components. Our methods use profiling techniques to estimate the components. We show that the proposed variable selection method has selection consistency and the estimators of parametric components have the oracle property. Also, our nonparametric estimators achieve the convergence rate of univariate nonparametric models. We provide several simulation studies and real data analysis to evaluate the numerical performance of the proposed methods.