On heavy-tailed matrix variate regression models and statistical diagnostics

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Abstract

Matrix variate distributions and matrix regression models are powerful tools for analysing multivariate data with inherent matrix structure. These methods extend traditional univariate and multivariate techniques to handle more complex data structures, such as those found in genomics, neuroscience, and image analysis. In this talk, we introduce a framework for regression models under heavy-tailed matrix variate distributions. We begin by discussing several matrix variate distributions and then explore the general linear model under the matrix variate normal distribution, along with its relevant variations based on heavy-tailed distributions. Additionally, we cover important sensitivity analysis and statistical diagnostics for these models, highlighting potential future research problems and applications. Our goal is to provide insights into the theoretical and practical aspects of heavy-tailed matrix variate regression models, paving the way for further advancements in this area.

Keywords

Complex data structure, Heavy-tailed distribution, Matrix variate regression model, Sensitivity analysis, Statistical diagnostics.