國立成功大學統計學系暨數據科學研究所
專題演講

演講者: Prof. Sheng-Mao Chang (張升懋 副教授)
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時　間: 2020年11月19日 (星期四) 15:30 - 16:30

地　點: 統計學系三樓視聽教室 (62331)

茶　會: 15:00 - 15:25 (統計學系二樓教師休息室)

題　目: Constrained low-rank matrix regression

摘　要

Tensor regression is a linear regression with a tensor, a matrix when the dimension is 2, as its covariates. Preserving the prediction power of a tensor by a low-rank tensor is the main goal of performing tensor regression. However, in some applications, hypothesis testing is much crucial than prediction. Less attention has been put on hypothesis testing in literature. In this work, we consider a constrained low-rank matrix regression to accommodate spatial structures with fewer parameters in the regression model. The proposed constraint ensures the model identifiability and results in accurate type I error rate. Additionally, we proved that the proposed constraint is not necessarily unique. Different constraints, under some conditions, result in the same parameter estimation as well as the Fisher information matrix. Thus, classical alternating least-square algorithm can be applied directly for parameter estimation. Moreover, we argued that, instead of BIC, AIC is more relevant to the rank selection issue. These features were examined by simulation studies. Also, we applied the proposed model to a multi-omics data by demonstration.

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