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An Image-on-Scalar Regression-based Classifier and its
Applications

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摘要

This study proposes an image classification method under a framework of image-on-scalar regression. The first step for establishing the proposed classifier is to select relevant variables from many features suggested by experts via logistic regression with a model selection criterion. The second step employs the image-on-scalar regression with normal subjects' images and the selected variables to set up a baseline model. We propose to collect the descriptive statistics of each subject's residual matrix via the baseline model. The features obtained from the two steps are used to learn an optimal machine learning classifier under a 5-fold cross-validation framework. In our empirical study, the proposed classifier is applied to the identification of Parkinson's images. The numerical results reveal that the proposed classifier has satisfactory performances.

Keywords : classification, image-on-scalar regression, variable selection

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