

Modern Applied Mathematics for the Classification of Satellite Images

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Abstract: To estimate an unknown (predictor, response) dependency (or model) from training data (consisting of a finite number of observations) with good prediction (generalization) capabilities for future (test) data is the basic aim of the learning task. Nonparametric regression and classification techniques are mostly the key data mining tools in explaining real life problems and natural phenomena where many effects often exhibit nonlinear behavior. In this talk, a novel application of a state-of-the-art nonparametric tool, *Multivariate Adaptive Regression Splines* (MARS), for the classification of multispectral satellite images is represented within a well-elaborated framework. A set of MODIS (*Moderate Resolution Imaging Spectroradiometer*) images is classified by using MARS method. The relation between the variations in the MARS model building parameters and their effect on the predictive performance are represented. Performance of MARS in classification is compared with the traditional maximum-likelihood method.

Keywords: MARS, Nonparametric regression splines, Multispectral image classification, MODIS