

Penalised regression on a graph

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We consider the problem of nonparametric regression where the aim is to approximate noisy observations by simple functions. In particular we generalise Total Variation denoising from the common situation of regression in one dimension to the problem of regression on graphs. Here the observations lie on the knots of a graph and instead of covariates there is a graphical structure which determines which observations are close to each other. Our new generalised version of TV denoising penalises the distance between the data and the fit on the knots as well as the total variation along the edges of the graph. We consider in particular algorithmical problems and develop a new fast algorithm for regression on a graph.