



An information-geometrical path algorithm for Poisson regression

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We consider Poisson regression for counting data and compare three estimation methods. The first method, *bisector regression* (BR), was proposed by our previous work, which is based on the information geometry of the statistical model. The second, *differential geometric least angle regression* (DGLARS), is another method based on the information geometry. The third is the l_1 -regularization method. These methods are related with the least angle regression (LARS) algorithm, which is an important algorithm in the normal linear regression. BR and DGLARS are directly motivated by LARS and they are extensions of LARS for settings more than the normal linear regression. In the normal linear regression setting, the l_1 -regularization method, *lasso*, is known to be closely related with LARS. Three methods output the sequence of parameter estimates, each estimate of which is corresponding to a submodel. This fact means that the methods select a model in addition to parameter estimation. In the paper, we compare three methods by analyzing datasets and numerical experiments. The methods make similar but different results.

Keywords: bisector regression; information geometry; least angle regression; regularization.