Penalized Empirical Likelihood for the Sparse Cox Model

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Abstract: The current penalized regression methods for selecting predictor variables and estimating the associated regression coefficients in the Cox model are mainly based on partial likelihood. In this paper, an empirical likelihood method is proposed for the Cox model in conjunction with appropriate penalty functions when the dimensionality of data is high. Theoretical properties of the resulting estimator for the large sample are proved. Simulation studies suggest that empirical likelihood works better than partial likelihood in terms of selecting correct predictors without introducing more model errors. The well-known primary biliary cirrhosis data set is used to illustrate the proposed empirical likelihood method. Joint work with Dongliang Wang and Tong Tong Wu.