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Extended Bayesian information criterion in the Cox model with a high-dimensional feature space

Shan Luo · Jinfeng Xu · Zehua Chen

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Abstract Variable selection in the Cox proportional hazards model (the Cox model) has manifested its importance in many microarray genetic studies. However, theoretical results on the procedures of variable selection in the Cox model with a high-dimensional feature space are rare because of its complicated data structure. In this paper, we consider the extended Bayesian information criterion (EBIC) for variable selection in the Cox model and establish its selection consistency in the situation of high-dimensional feature space. The EBIC is adopted to select the best model from a model sequence generated from the SIS-ALasso procedure. Simulation studies and real data analysis are carried out to demonstrate the merits of the EBIC.

Keywords Variable selection · Cox model · Extended Bayesian information criterion · Selection consistency