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Joint feature screening for ultra-high-dimensional sparse additive hazards model by the sparsity-restricted pseudo-score estimator

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Abstract
Due to the coexistence of ultra-high dimensionality and right censoring, it is very challenging to develop feature screening procedure for ultra-high-dimensional survival data. In this paper, we propose a joint screening approach for the sparse additive hazards model with ultra-high-dimensional features. Our proposed screening is based on a sparsity-restricted pseudo-score estimator which could be obtained effectively through the iterative hard-thresholding algorithm. We establish the sure screening property of the proposed procedure theoretically under rather mild assumptions. Extensive simulation studies verify its improvements over the main existing screening approaches for ultra-high-dimensional survival data. Finally, the proposed screening method is illustrated by dataset from a breast cancer study.

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