

Parametric estimates for the receiver operating characteristic curve generalization for non-monotone relationships

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Diagnostic procedures are based on establishing certain conditions and then checking if those conditions are satisfied by a given individual. When the diagnostic procedure is based on a continuous marker, this is equivalent to fix a region or classification subset and then check if the observed value of the marker belongs to that region. Receiver operating characteristic curve is a valuable and popular tool to study and compare the diagnostic ability of a given marker. Besides, the area under the receiver operating characteristic curve is frequently used as an index of the global discrimination ability. This paper revises and widens the scope of the receiver operating characteristic curve definition by setting the classification subsets in which the final decision is based in the spotlight of the analysis. We revise the definition of the receiver operating characteristic curve in terms of particular classes of classification subsets and then focus on a receiver operating characteristic curve generalization for situations in which both low and high values of the marker are associated with more probability of having the studied characteristic. Parametric and non-parametric estimators of the receiver operating characteristic curve generalization are investigated. Monte Carlo studies and real data examples illustrate their practical performance. © The Author(s) 2017.

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Receiver operating characteristic curve generalization

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