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Jackknife empirical likelihood for the difference of two volumes under ROC surfaces

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Abstract The volume under a surface (VUS) is an effective measure for evaluating the discriminating power of a diagnostic test with three ordinal diagnostic groups. In this paper, we investigate the difference of two correlated VUS's to compare two treatments for discrimination of three-class classification data. A jackknife empirical likelihood (JEL) procedure is employed to avoid the variance estimation in the existing methods. We prove that the limiting distribution of the empirical log-likelihood ratio statistic follows a χ^2 distribution. Extensive numerical studies show that the JEL confidence intervals outperform those based on the normal approximation method. The proposed method is also applied to the Alzheimer's disease data.

Keywords Jackknife empirical likelihood · Receiver operating characteristic (ROC) curve · Volume under an ROC surface

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