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Confidence Information of ROC Curves, AUC, and Partial AUC with JMP®

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ABSTRACT

While ROC curves have been a well-established tool to study sensitivity and specificity for many years and are implemented in numerous statistical software applications, the same is not true for the corresponding confidence information. Confidence information of ROC curves and AUC is needed for comparing ROC curves at a particular point, over a certain interval, or over the complete range.

In this paper, we discuss different approaches for constructing confidence bands around ROC curves. We present confidence intervals of AUC and partial AUC, where the area is restricted to an interval of the false positive rate. In addition, we show how imposing weights on false positive or false negative events changes the optimal cutoff point.

Finally, we present a scripted JMP® application that allows the user to interactively choose confidence bands, select relative weights for cutoff values, and dynamically change the interval for the partial AUC to identify areas of significant differences.

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