Area based testing under likelihood ratio ordering
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Abstract: The ordinal dominance curve formed by the one sample and two sample MLE estimators of two cumulative distribution functions $F$ and $G$ under likelihood ratio ordering possesses a very appealing geometric interpretation in terms of the ordinal dominance curve formed by the traditional empirical estimates of $F$ and $G$. This geometric interpretation, a least concave majorant, suggests some natural testing procedures. The Mann-Whitney test statistic is the area under the ordinal dominance curve formed by the traditional empirical estimates of $F$ and $G$. Under a likelihood ratio ordering constraint, a natural test statistic is the area under the restricted or concave ordinal dominance curve. Tests are suggested for testing equality of $F$ and $G$ versus likelihood ratio ordering and likelihood ratio ordering versus all alternatives.