NORMED INFORMATION RATES
AND THEIR APPLICATIONS

By

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Abstract

Rajski (1962) introduced a normed information rate as a measure of correlation between two discrete random variables. His measure is the ratio of Kullback-Leibler information rate to the Shannon joint entropy measure.

In this thesis we extend Rajski's work in two directions. First we consider new normed information rates based on information rates of Renyi, Sharma, and Vajda measures, and also on joint entropy of degree \((a,\beta)\), joint entropy of order \((a,\beta)\) and Awad's entropies. Secondly, we extend Rajski's work to the continuous case.

All the measures considered are applied to a bivariate uniform distribution. Also, the measures are applied to a contingency table in which \(n\) observations from a bivariate distribution are classified into classes. To study the effect of discretizing a continuous distribution on these measures we again use the bivariate uniform distribution.

Numerical comparisons between the measures are made to choose a measure which has some advantages over the other measures.