

**UTSA College of Business**  
**Department of Management Science and Statistics**  
**Research Seminar Series**

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“Expected Conditional Characteristic Function-based Measures for Testing Independence”

Xiangrong Yin

Department of Statistics

University of Kentucky

**Abstract**

We propose a novel class of independence measures for testing independence between two random vectors based on the discrepancy between the conditional and the marginal characteristic functions. If one of the variables is categorical, our asymmetric index can be redeemed as the between group dispersion in a kernel ANOVA decomposition and leads to more powerful tests than those relying on symmetric measures. In addition, our index is also applicable when both variables are continuous. We develop two empirical estimates and obtain their respective asymptotic distributions. We illustrate the advantages of our approach by numerical studies across a variety of settings.