



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

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Minimum Hellinger Distance Estimator of Wavelet Variances

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ABSTRACT

Wavelets are the mathematical tools which have been developed for analyzing time series data or images in recent years. Recently, there has been considerable interest in applying Wavelets to analyzing time series data that can be considered as realizations of certain one- and two- dimensional stochastic process. Wavelets and Wavelet variance (or wavelet power spectrum) decompose the weighted average change and variance of a stochastic process on a scale-by-scale basis respectively, and its computational efficiency and nice mathematical property together help Wavelets become an useful tool in analyzing times series and images. While Wavelets method has been a mature tool for time series analysis, the mathematical nature of it still implies its sensitivity to contamination (outlier effect). In this paper, we tried to reduce the sensitivity of Wavelets method to contamination by combining the ideas of Hellinger distance and Wavelets method. Comparison of results from regular Wavelets method and the method combined ideas of Hellinger distance and Wavelets show the effectiveness of adding the idea of Hellinger distance in reducing contamination effect.

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