A QUANTITATIVE COMPARISON OF NON-PARAMETRIC TIME–FREQUENCY REPRESENTATIONS (WedPmPO3)

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Abstract:

In this paper we compare a variety of non-parametric time–frequency methods to determine the best time–frequency representation (TFR) for a collection of signals. These methods include quadratic time–frequency transforms, atomic decomposition and adaptive quadratic time–frequency transforms. The performance measures used to assess the TFRs include; two–dimensional correlation, IF correlation and time–frequency resolution. Synthetic signals with different time–frequency characteristics were used in the comparison to show the strengths and weaknesses of the different time–frequency methods. It was determined that adaptive quadratic time–frequency representations provide the best overall performance and should be used if no a priori information about the time–frequency characteristics of a signal is known.