**Fair M-Estimators as a Cost Function for FASTICA**

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Abstract— Independent Component Analysis (ICA), useful for Blind Source Separation, is a method of decomposing an observed dataset, which has been created by the influence of multiple sources, into the set of statistically independent variables which created it. ICA uses cost function to process the dataset, and it requires that the cost function used for separation be robust, consistent and non-quadratic in nature to properly differentiate the individual components. It is also required that the cost function is computationally simple, converges quickly and does not fail to converge when applied on different data sets .One of the ideal methods for Independent Component Analysis is FastICA. Given the apparent freedom to choose non-linearites, it is proposed here to use Fair M-Estimator as a cost function for the FastICA. M-Estimators are a generalized case of Maximum Likelihood Estimators. Huber proposed M-Estimators for estimating the likelihood of a variable contained in a normal distribution, which has been effected by outliers. The algorithm obtained from this cost function is simple to implement, and is useful in removing outliers from an observed dataset. Simulations are run to compare the algorithm on non-gaussian and real life speech examples against standard FastICA cost functions. The separating capability, along with convergence speed and the ability to converge successfully is observed in this paper.