

# Bayesian Estimation for Updating Coefficients in the Neural Networks

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**Abstract.** Bayesian inference approach is well known to solve inverse problems in signal and image processing. In this paper we focused on source separation that has become one of the most major fields in the signal and image processing. Classical approaches based on Independent component analysis (ICA) and Principal Component Analysis (PCA) suffer from mapping mixed noises to the desired properties of the sources, on the other hand they try to analyze and separation of signals features using the linear approaches that is unsuitable for non-linear nature of the signals. Therefore using of a non-linear analysis of signals component like Neural-Networks is possible and must be considered. We show that a MLP network with Bayesian estimation for updating coefficients can be used in many signal and image processing application and the proposed algorithm can also serve as very good standard for maximize separation regions, Data Mining applications and minimizing Mutual Information.

**Keywords:** Blind source separation, Bayesian estimation, Independent component analysis (ICA), Principal Component Analysis (PCA), Multi-Layer Perceptron (MLP).