

Direct Blind Separation Methods for Convolutional Images Mixtures

Authors : Ahmed Hammed, Wady Naanaa

Abstract : In this paper, we propose a general approach to deal with the problem of a convolutional mixture of images. We use a direct blind source separation method by adding only one non-statistical justified constraint describing the relationships between different mixing matrix at the aim to make its resolution easy. This method can be applied, provided that this constraint is known, to degraded document affected by the overlapping of text-patterns and images. This is due to chemical and physical reactions of the materials (paper, inks,...) occurring during the documents aging, and other unpredictable causes such as humidity, microorganism infestation, human handling, etc. We will demonstrate that this problem corresponds to a convolutional mixture of images. Subsequently, we will show how the validation of our method through numerical examples. We can so obtain clear images from unreadable ones which can be caused by pages superposition, a phenomenon similar to that we find every often in archival documents.

Keywords : blind source separation, convoluted mixture, degraded documents, text-patterns overlapping

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