Algorithm for Underdetermined Independent Component Analysis

Independent Component Analysis (ICA) consists of splitting a data set into statistically independent components. This is also called blind source separation. ICA is a very fundamental problem that has already been used in very diverse applications. The most well-known application is probably the cocktail party problem: at a party we succeed in understanding the words spoken to us, while actually several people are speaking at the same time. These different source signals are separated by our brain, or at least one relevant source signal is picked out. Other applications can be found in music, image processing, mobile communications (OFDM, CDMA, ...), biomedical problems (EEG, ECG, fMRI, ...), astrophysics, etc.

Recently, the so-called "underdetermined" ICA problem has become intensively studied. This means that there are more source signals than sensors that capture the signals. (There are quite a lot of people at the cocktail party and yet we have only two ears.) In this thesis, we will develop a state-of-the-art algorithm for underdetermined ICA.

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Evaluation: 25%



Alex Katz, *The Cocktail Party.*