

Accepted Manuscript

A New Proof of a Contrast Function for Bounded Component Analysis and Further Analysis

Wei Gao, Shen Fan, Roberto Togneri, Victor Sreeram

PII: S0885-2308(17)30310-8
DOI: [10.1016/j.csl.2018.03.002](https://doi.org/10.1016/j.csl.2018.03.002)
Reference: YCSLA 919

To appear in: *Computer Speech & Language*

Received date: 2 November 2017
Revised date: 19 March 2018
Accepted date: 31 March 2018

Please cite this article as: Wei Gao, Shen Fan, Roberto Togneri, Victor Sreeram, A New Proof of a Contrast Function for Bounded Component Analysis and Further Analysis, *Computer Speech & Language* (2018), doi: [10.1016/j.csl.2018.03.002](https://doi.org/10.1016/j.csl.2018.03.002)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



A New Proof of a Contrast Function for Bounded Component Analysis and Further Analysis

Wei Gao^{a,*}, Shen Fan^b, Roberto Togneri^a, Victor Sreeram^a

^a*School of Electrical Electronic and Computer Engineering, The University of Western Australia, Perth 6009, Australia.*

^b*College of Science, China University of petroleum (Beijing), Beijing 102200, China*

Abstract

Bounded Component Analysis (BCA) solves the Blind Source Separation (BSS) problem [based on geometric assumptions](#). This paper introduces a new proof of a BCA contrast function, derived from elementary matrices, Gauss-Jordan elimination and convex geometry. The new proof and further analysis provide additional insight into a key assumption [of BCA](#). In addition, an interpretation is presented to clarify one of the limitations of the instantaneous BCA algorithm. Experiments on audio sources support our analysis.

Keywords: bounded component analysis, blind source separation, independent component analysis, elementary matrix, convex geometry, audio signals.

1. Introduction

As the name “blind” suggests, Blind source separation (BSS) aims to recover the sources from mixtures of the sources only, without prior information of the sources and the way the sources were mixed [1]. The “blind” feature not only leads to a broad variety of applications in practice, such as

*Corresponding author

Email addresses: wei.gao@research.uwa.edu.au (Wei Gao), fans@cup.edu.cn (Shen Fan), roberto.togneri@uwa.edu.au (Roberto Togneri), victor.sreeram@uwa.edu.au (Victor Sreeram)

¹The work of Shen Fan was supported by Science Foundation of China University of Petroleum, Beijing (No.YJRC-2011-14, No.FZG-2011-01).

Download English Version:

<https://daneshyari.com/en/article/6951468>

Download Persian Version:

<https://daneshyari.com/article/6951468>

[Daneshyari.com](https://daneshyari.com)