

Blind Signal separation: Concepts, Applications and Some New Challenges

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Talk abstract. Blind signal separation is an emerging field of research with a broad range of applications. It is motivated by practical problems that involve several source signals and several sensors. Each sensor receives a mixture of the source signals. The problem under consideration consists of recovering the original waveforms of the source signals without any knowledge of the mixture structure. The latter may be instantaneous linear mixture, convolutive mixture or nonlinear mixture. This talk concentrates on the instantaneous linear model, which corresponds to a linear memoryless channel. This model has shown to be a good approximation in various applications such as jammer mitigation, eye artifact removal in electroencephalography, rotating machine monitoring, airport surveillance, financial time series analysis and telecommunications.

The talk is an introduction to the blind signal separation problem. An attempt of classification of the existing methods will be provided. Some applications will be presented together with new challenges in the field.

The speaker plans to address a broad audience with general background in signal processing.

Biography speaker:



Adel Belouchrani was born in Algiers, Algeria, on May 5, 1967. He received the State Engineering degree in 1991 from Ecole Nationale Polytechnique (ENP), Algiers, Algeria, the M.S. degree in signal processing from the Institut National Polytechnique de Grenoble (INPG), France, in 1992, and the Ph.D. degree in signal and image processing from Télécom Paris (ENST), France, in 1995. He was a Visiting Scholar at the Electrical Engineering and Computer Sciences Department, University of California, Berkeley, from 1995 to 1996. He was with the Department of Electrical and Computer Engineering, Villanova University, Villanova, PA, as a Research Associate from 1996 to 1997.

From 1998 to 2005, he has been with the Electrical Engineering Department of ENP as Associate Professor. He is currently and since 2006 Full Professor at ENP. His research interests are in statistical signal processing, (blind) array signal processing, time–frequency analysis and time–frequency array signal processing with applications in biomedical and telecommunications. He has supervised over 20 PhD theses. Professor Belouchrani is an IEEE Senior Member and has published over 180 technical publications including over 50 journal papers, 4 book chapters and 4 patents that have been cited over 6200 times according to Google Scholar and over 2300 time according to ISI Web Of Science. He has been an Associated Editor of the IEEE Transactions on Signal Processing for two terms from 2013 to 2017. He is currently an Area Senior Editor for the IEEE Transactions on Signal Processing and Editorial board member of the Digital signal processing Journal (Ed. Elsevier). Prof. Belouchrani has been nominated as a founding member of the Algerian Academy of Science and Technology.