

Independent Component Analysis

Martin Sewell

Department of Computer Science
University College London

April 2007 (updated August 2008)

Independent component analysis (ICA) is a computational method from statistics and signal processing which is a special case of blind source separation. ICA seeks to separate a multivariate signal into additive subcomponents supposing the mutual statistical independence of the non-Gaussian source signals. The general framework of ICA was introduced in the early 1980s (Hérault and Ans 1984; Ans, Hérault and Jutten 1985; Hérault, Jutten and Ans 1985), but was most clearly stated by Pierre Comon in 1994 (Comon 1994). For a good text, see Hyvärinen, Karhunen and Oja (2001).

References

- ANS, B., J. HÉRAULT, and C. JUTTEN, 1985. Adaptive neural architectures: Detection of primitives. *In: Proceedings of COGNITIVA '85.* pp. 593–597.
- COMON, Pierre, 1994. Independent Component Analysis, A New Concept? *Signal Processing*, **36**(3), 287–314.
- HÉRAULT, J., and B. ANS, 1984. Circuits neuronaux à synapses modifiables: Décodage de messages composites par apprentissage non supervisé. *Comptes Rendus de l'Académie des Sciences*, **299(III-13)**, 525–528.
- HÉRAULT, J., C. JUTTEN, and B. ANS, 1985. Détection de Grandeurs Primitives dans un Message Composite par une Architecture de Calcul Neuromimétique en Apprentissage non Supervisé. *In: Actes du Xème colloque GRETSI.* pp. 1017–1022.
- HYVÄRINEN, Aapo, Juha KARHUNEN, and Erkki OJA, 2001. *Independent Component Analysis.* Adaptive and Learning Systems for Signal Processing, Communications, and Control. New York: Wiley.