



## CANONICAL CORRELATION ANALYSIS (CCA) ALGORITHMS FOR MULTIPLE DATA SETS: APPLICATION TO BLIND SIMO EQUALIZATION (TueAmPO2)



★ Author(s) :

Javier Vía

(University of Cantabria, Spain)

Ignacio Santamaria

(University of Cantabria, Spain)

Jesús Pérez

(University of Cantabria, Spain)

★ Abstract :

Canonical Correlation Analysis (CCA) is a classical tool in statistical analysis that measures the linear relationship between two or several data sets. In [1] it was shown that CCA of  $M=2$  data sets can be reformulated as a pair of coupled least squares (LS) problems. Here, we generalize this idea to  $M \geq 2$  data sets. First, we present a batch algorithm to extract all the canonical vectors through an iterative regression procedure, which at each iteration uses as desired output the mean of the outputs obtained in the previous iteration. Furthermore, this alternative formulation of CCA as  $M$  coupled regression problems allows us to derive in a straightforward manner a recursive least squares (RLS) algorithm for on-line CCA. The proposed batch and on-line algorithms are applied to blind equalization of single-input multiple-output (SIMO) channels. Some simulation results show that the CCA based algorithms outperform other techniques based on second-order statistics for this particular application.