Canonical Ridge Analysis with Ridge Parameter Optimization

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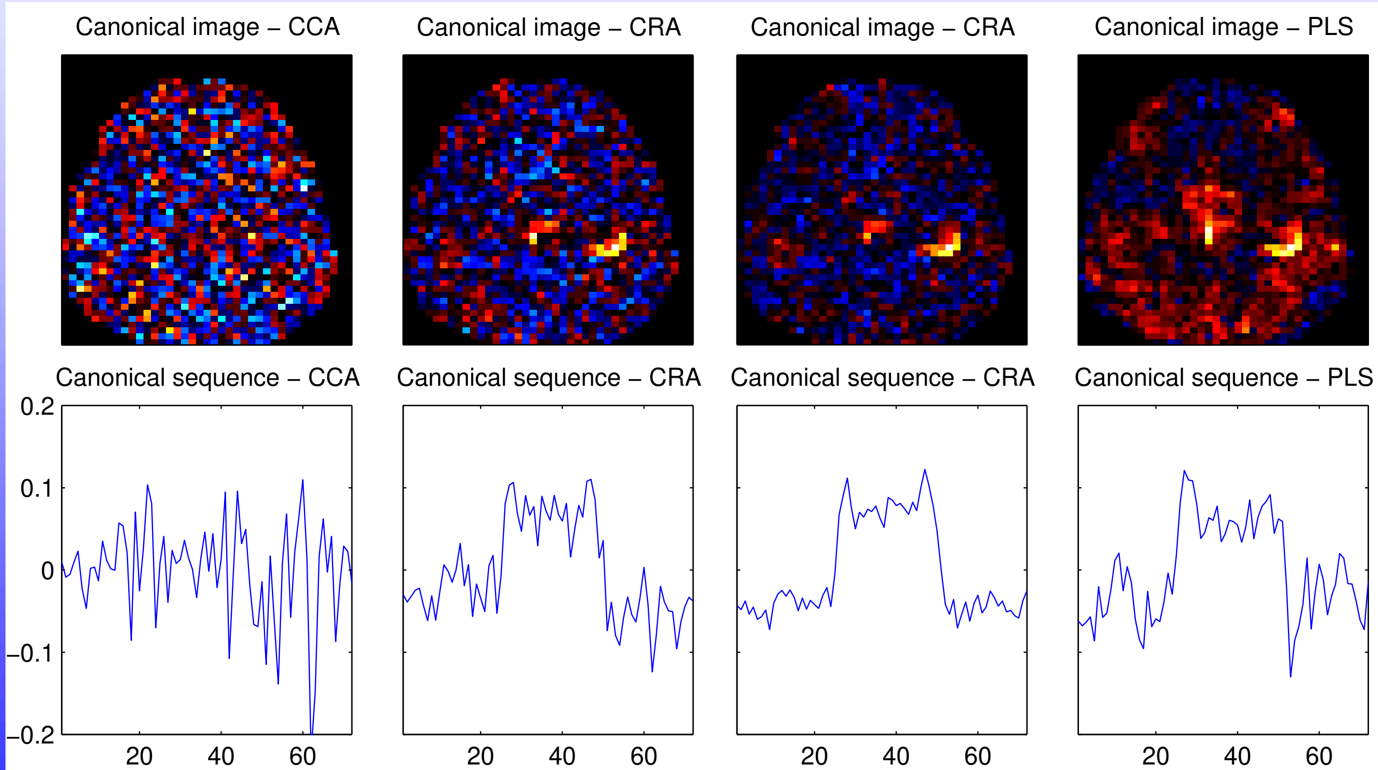
The Human Brain Project, P20 MH57180 "Spatial and Temporal Patterns in Functional Neuroimaging", The Danish Research Councils

$$\mathbf{G}^\top \mathbf{X}\left((1-k)\mathbf{X}^\top\mathbf{X}+k\mathbf{I}\right)^{-1/2} = \mathbf{USV}^\top$$



$k = 0$ $\quad 0 \le k \le k_{optimal}$ $\quad k = k_{optimal}$ $\quad k = 1$

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- CCA, Canonical Correlation Analysis
  - + Potentially best discrimination
  - – Sensitive to noise
- (O)PLS, (Orthonormalized) Partial Least Square
  - + Robust determination of covariance
  - – Not optimal discrimination
  - – Sensitive to structured noise
- CRA, Canonical Ridge Analysis
  - + Best generalizable discrimination
  - – Optimization of the ridge parameter k