1 Preliminaries

$\Sigma_{ij} = cov(X_i, X_j) = E[(X_i - \mu_i)(X_j - \mu_j)]$, where $E(X_i)$ CITEME: Wikipedia

2 Summary

Let $X_1, X_2 \in \mathbb{R}^n$ be two arbitrary vectors with covariances $\Sigma_{X_1X_1}, \Sigma_{X_2X_2}$ and cross-covariance $\Sigma_{X_1X_2}$ [1].

Canonical correlation analysis (CCA) tries to find vectors w_1 and w_2 that maximizes correlation ρ [2]:

$$\rho = \frac{w_1^T \Sigma_{X_1X_2} w_2}{\sqrt{w_1^T \Sigma_{X_1X_1} w_1}\sqrt{w_2^T \Sigma_{X_2X_2} w_2}}$$

References

[1] Galen Andrew, Raman Arora, Karen Livescu, and Jeff Bilmes. Deep canonical correlation analysis. In *International Conference on Machine Learning (ICML)*, Atlanta, Georgia, 2013.

[2] Magnus Borga. Canonical Correlation a Tutorial. `http://www.imt.liu.se/~magnus/cca/tutorial/tutorial.pdf/`. [Online; accessed 27-Oct-2016].