

Generalized Contrastive PCA (gcPCA): a generalized framework for finding low-dimensional subspaces that differ between experimental conditions

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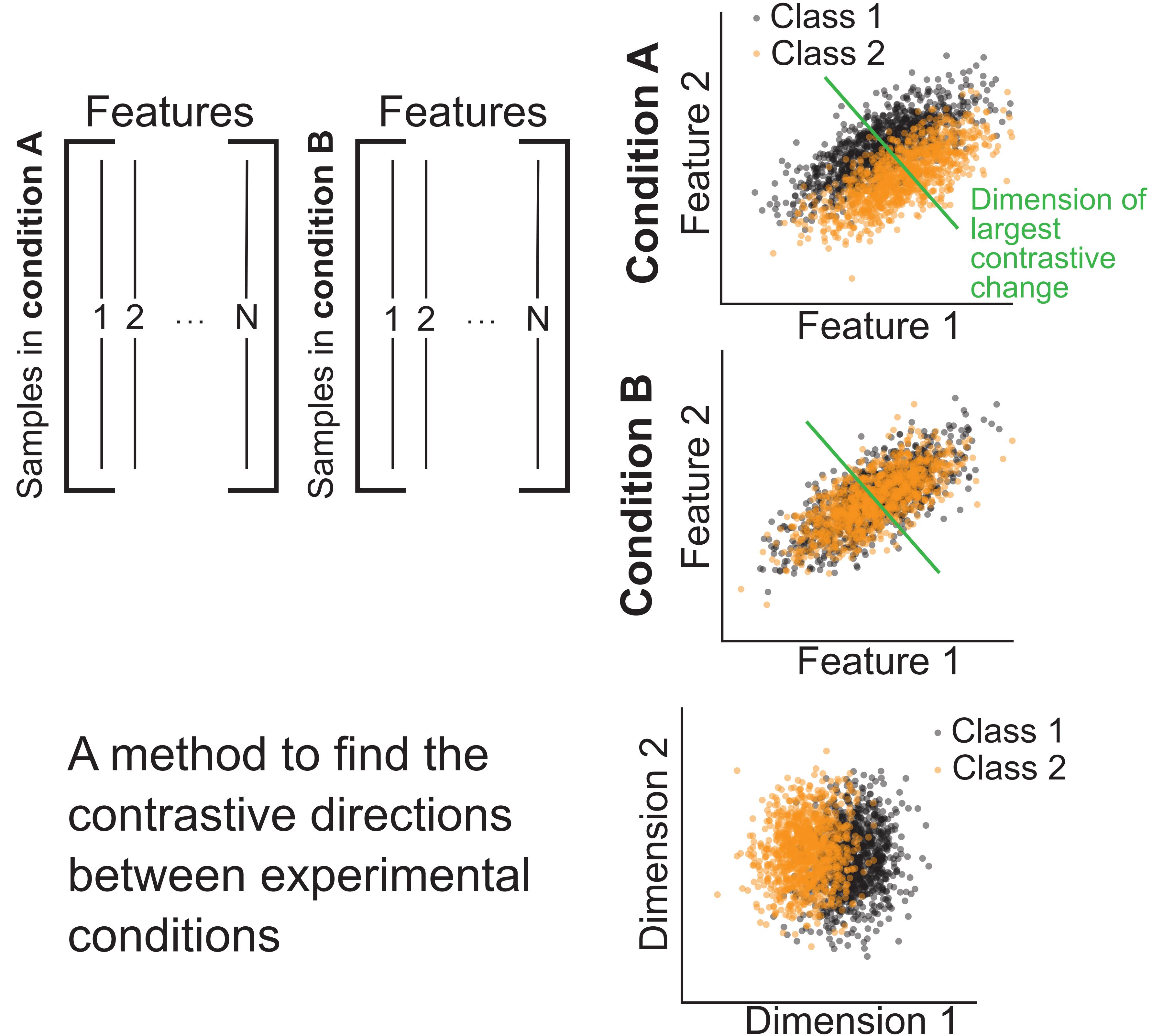
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Motivation



A method to find the contrastive directions between experimental conditions

Implementation

$$\max_{\mathbf{x}} \mathbf{x}^T A \mathbf{x}$$

generalized contrastive PCA

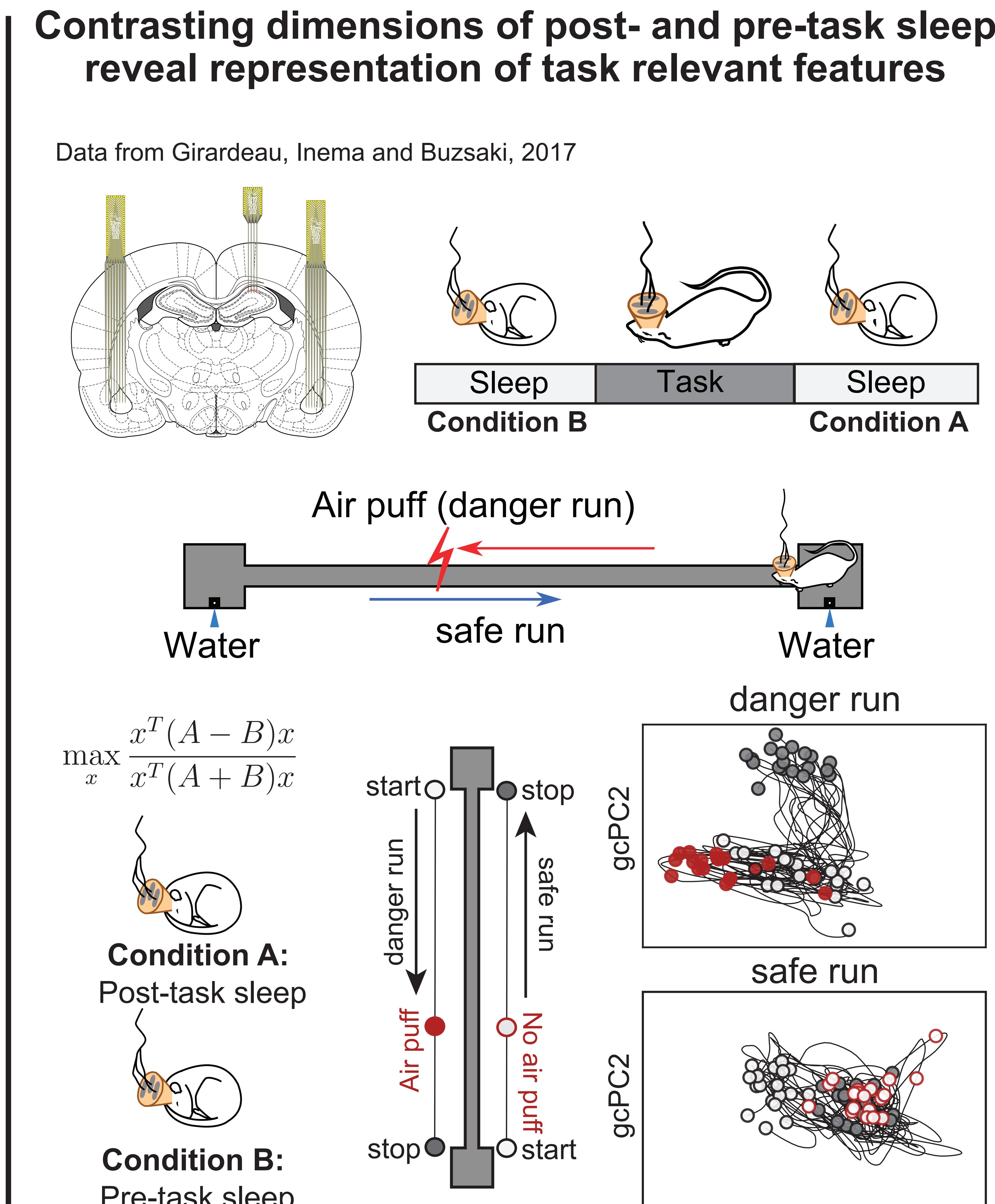
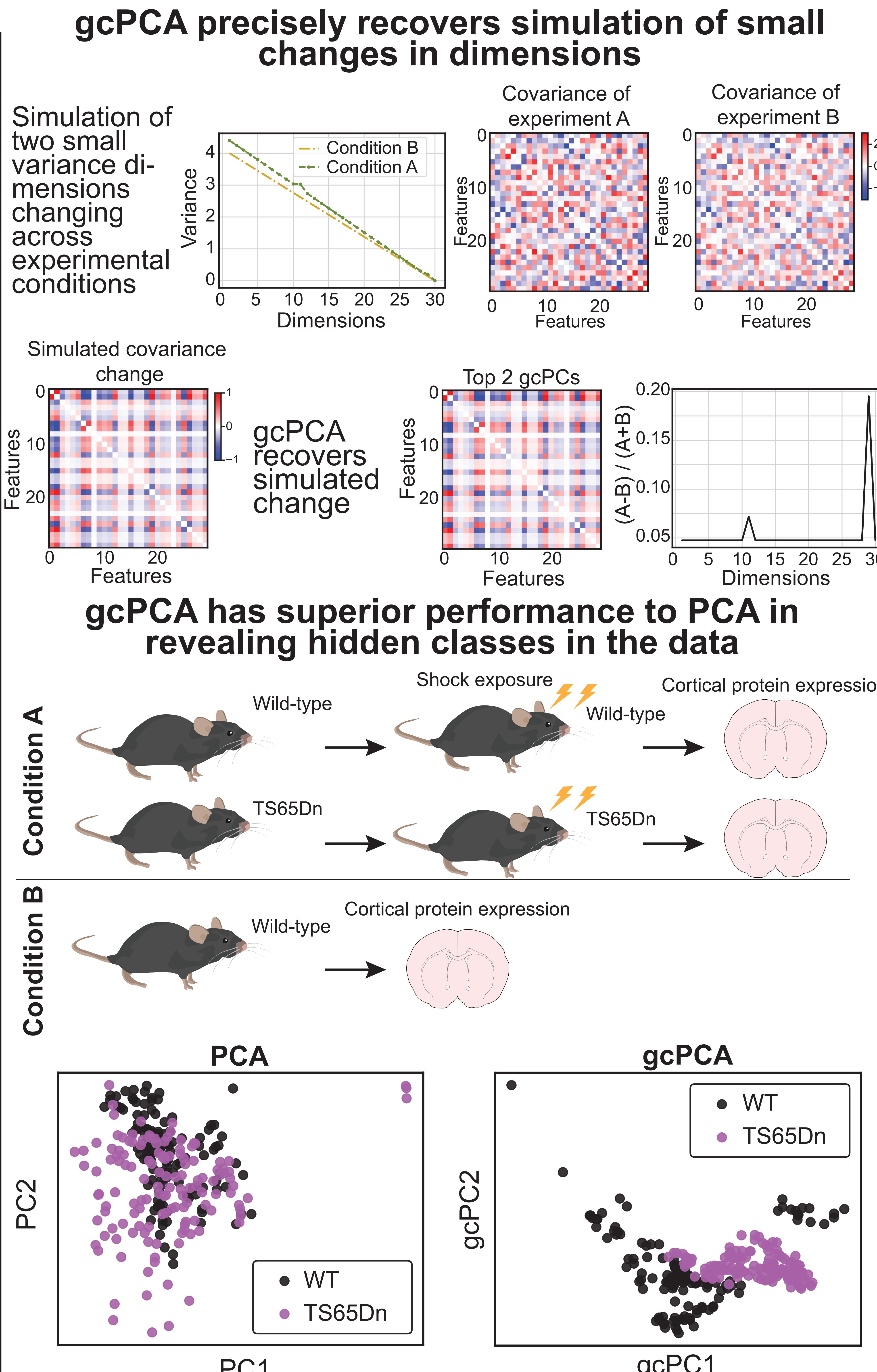
$$\max_x \frac{x^T(A - B)x}{x^T(A + B)x}$$

gcPCA version v1 v2 v3 v4

Equivalent to cPCA Equivalent to cPCA++

Proposed

Propose



References

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 - R. Salloum, C.-C. J. Kuo, cPCA++: An efficient method for contrastive feature learning. *Pattern Recognit* 124, 108378 (2022).
 - G. Girardeau, I. Inema, G. Buzsáki, Reactivations of emotional memory in the hippocampus–amygdala system during sleep. *Nat Neurosci* 20, 1634–1642 (2017)

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