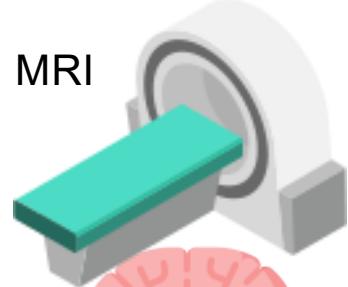
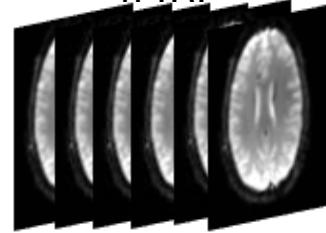


## rs-fMRI Time Series

MRI

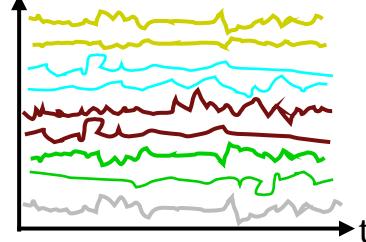


fMRI



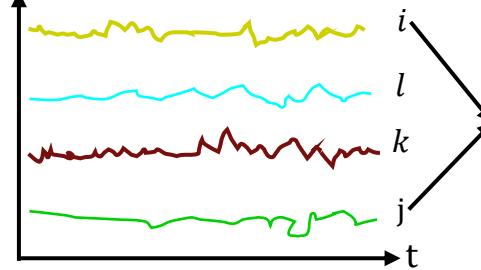
AAL 116 or  
Neuromark  
2.2 Template

ROIs



ROIs

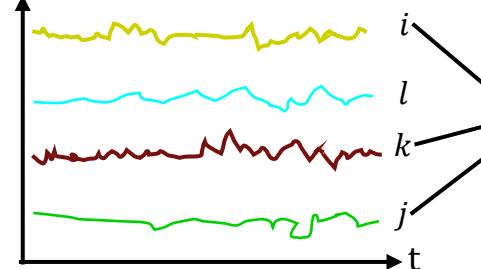
### 2-order: Mutual Information



$$I_{\alpha}(X_i; X_j) = H(X_i) + H(X_j) - H(X_i; X_j)$$

ROIs

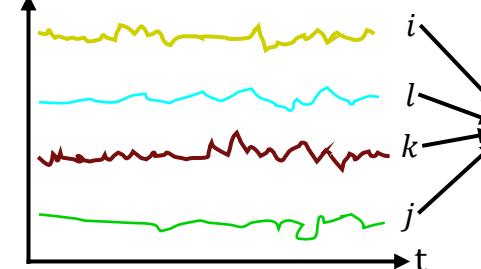
### 3-order: $\mathcal{O}$ -Information



$$\mathcal{O}(X_i, X_j, X_k) = \text{TC}(X_i, X_j, X_k) - \text{DTC}(X_i, X_j, X_k)$$

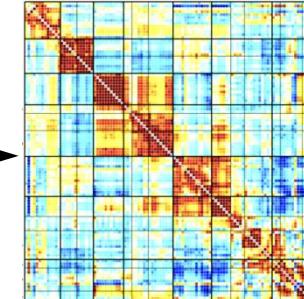
ROIs

### 4-order: $\mathcal{O}$ -Information



$$\mathcal{O}(X_i, X_j, X_k, X_l) = \text{TC}(X_i, X_j, X_k, X_l) - \text{DTC}(X_i, X_j, X_k, X_l)$$

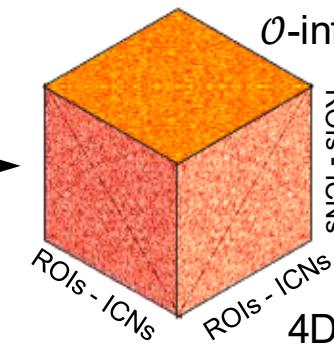
## Functional Network Connectivity (FNC) Matrix



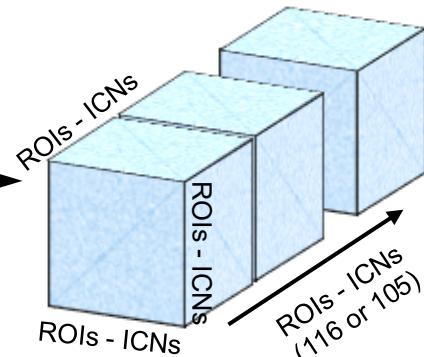
ROIs - ICNs

ROIs - ICNs

3D Tensor  
 $\mathcal{O}$ -information



4D Tensor  
 $\mathcal{O}$ -information



ROIs - ICNs  
(116 or 105)