

Multiple Kernel Learning

FC as a combination of multiple kernels derived from SC
and vice versa

SC to FC

- Consider a kernel space as Heat kernels at all scales
- Select some scales, say m , and try to find the linear combination of the kernels that is closest to FC

$$\mathbf{K}_i = f(\text{SC}, t_i) \quad \forall i = 1, \dots, m$$

$$\mathbf{K} = \sum_{i=1}^m \gamma_i \mathbf{K}_i$$

$$\operatorname{argmin}_{\gamma_i, \mathbf{K}_i} \|\mathbf{K} - FC\|$$

FC to SC

- similarly, find a set of inverse kernels whose linear combination is close to SC

$$\mathbf{K}_i = f(\text{FC}, t_i) \quad \forall i = 1, \dots, m$$

$$\mathbf{K} = \sum_{i=1}^m \theta_i \mathbf{K}_i$$

$$\underset{\theta_i, \mathbf{K}_i}{\operatorname{argmin}} \|\mathbf{K} - \text{SC}\|$$

Associated variables

1. form of kernels, heat kernel or gaussian kernels or RBFs, etc.
2. number of kernels , i.e m
3. linear combination parameters $\gamma_{\{i\}}$
4. if non-linear combination of $K_{\{i\}}$'s, what form?