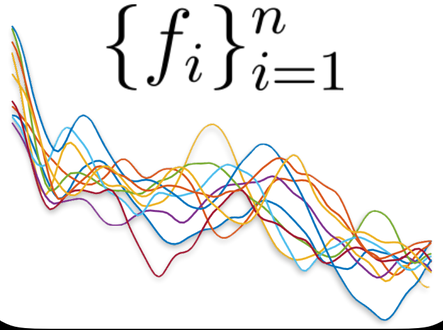
## Step 0: Function Alignment

**Data**

$$\{f_i\}_{i=1}^{n}$$



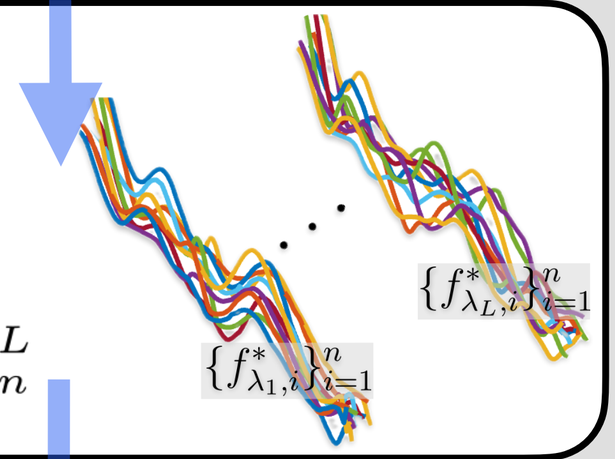
**Candidate Parameters**

$$\{\lambda_\ell\}_{\ell=1}^{L}$$

**Penalized Elastic Alignment**

**Aligned Functions**

$$\left\{f^*_{\lambda_\ell,i}\right\}_{\substack{\ell=1,\ldots,L\\ i=1,\ldots,n}}$$

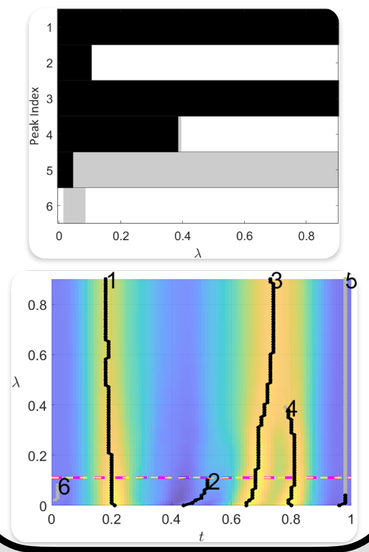



**Partial Elastic Mean**

$$\{\hat{g}_{\lambda_\ell}\}_{\ell=1}^{L}$$

## Step 1: PPD Choose $\lambda^*$

**PPD**




**Choose $\lambda^*$ with criteria**

**Mean with Optimal $\lambda^*$**

$$\hat{g}_{\lambda^*}$$

## Step 2: Function Estimation

**Initialization of Shape Est.**

$$\hat{g}_{init}$$

**Peak-Constrained Function Estimation**

**Final Estimate**

$$\hat{g}$$