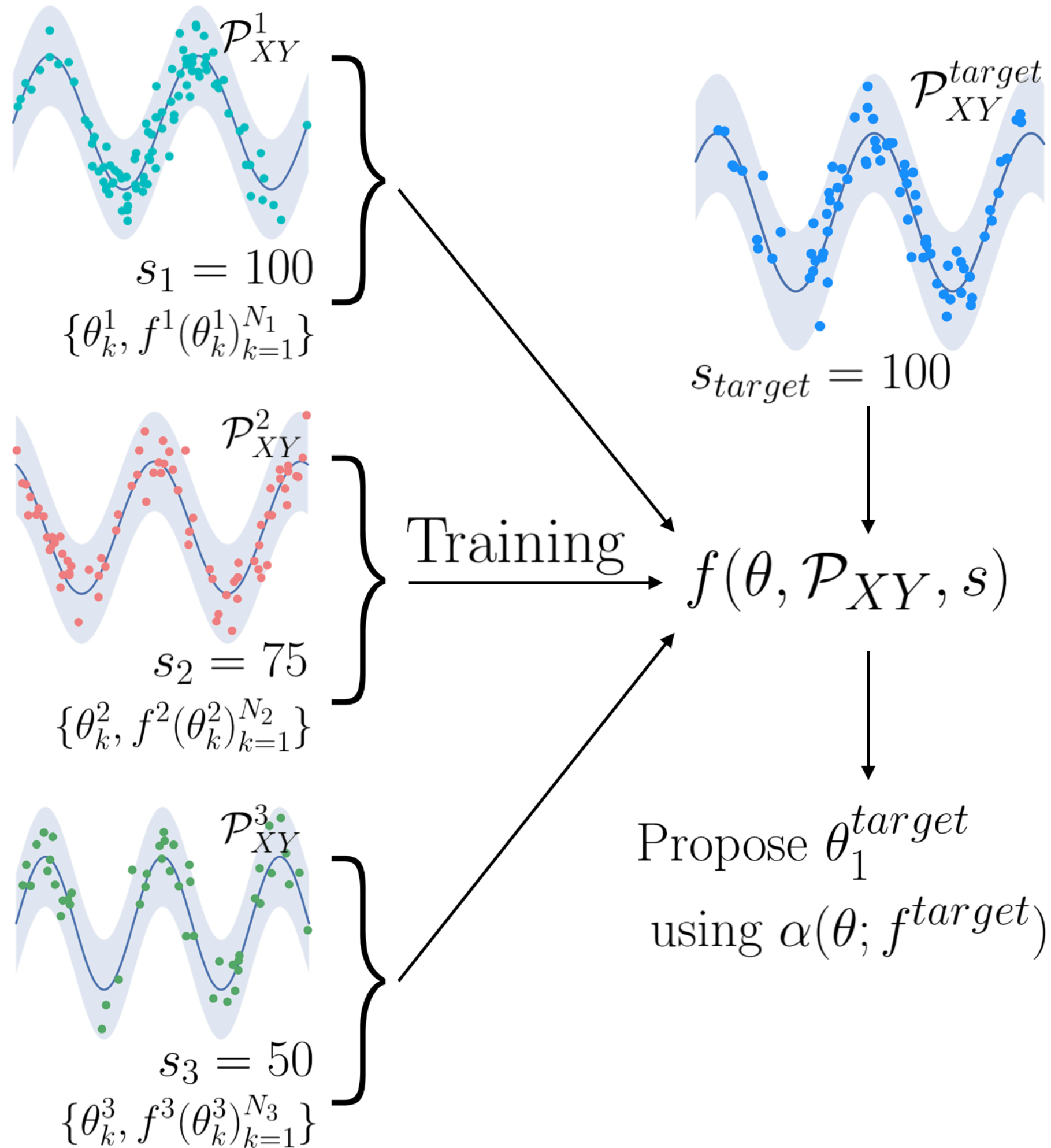# Hyperparameter Learning via Distributional Transfer

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Goal (hyperparameter selection):

Optimise f^{target} (target objective) w.r.t θ:

$$\theta^*_{target} = \mathrm{argmax}_{\theta \in \Theta} f^{target}(\theta)$$

Scenario:

- We have n potentially related tasks f^i, $i = 1, \ldots n$
- For these tasks, we have $\{\theta^i_k, f^i(\theta^i_k)\}^{N_i}_{k=1}$ from past runs

Method:

- Assume training data D_i comes from distribution $\mathcal{P}^i_{XY}$
- Transfer information using embeddings of $\mathcal{P}^i_{XY}$
- Jointly model θ, $\mathcal{P}_{XY}$ and sample size s