Train In Data

Tree-structured Parzen Estimators

TPE

Bayes' Rule

$$P(y\,|x) = \frac{P(x\,|y)\ \times P(y)}{P(x)}$$

y is the score ➔ f(x)

x is the hyperparameters

Gaussian Process Optimization

Approximate P(y | x) with surrogate function

$$P(y \mid x) = \frac{P(x \mid y) \times P(y)}{P(x)}$$

- Gaussian Process

y is the score ➔ f(x)

x is the hyperparameters

TPE

Approximate P(x | y) with surrogate function

$$P(y \mid x) = \frac{P(x \mid y) \times P(y)}{P(x)}$$

y is the score ➔ f(x)

x is the hyperparameters

$$p(x|y) = \begin{cases} \ell(x) & \text{if } y < y^* \\ g(x) & \text{if } y \geq y^* \end{cases}$$

TPE

Approximate P(x | y) with surrogate function

$$P(y \mid x) = \frac{P(x \mid y) \times P(y)}{P(x)}$$

y is the score ➔ f(x)

x is the hyperparameters

$$p(x|y) = \begin{cases} \ell(x) & \text{if } y < y^* \\ g(x) & \text{if } y \geq y^* \end{cases}$$

$$EI_{y^*}(x) \propto \left(\gamma + \frac{g(x)}{\ell(x)}(1-\gamma)\right)^{-1}$$

TPE

Approximate P(x | y) with surrogate function

$$P(y \mid x) = \frac{P(x \mid y) \times P(y)}{P(x)}$$

y is the score ➔ f(x)

x is the hyperparameters

Guides where to sample next for hyperparameters

$$p(x|y) = \begin{cases} \ell(x) & \text{if } y < y^* \\ g(x) & \text{if } y \geq y^* \end{cases}$$

$$EI_{y^*}(x) \propto \left(\gamma + \frac{g(x)}{\ell(x)}(1-\gamma)\right)^{-1}$$

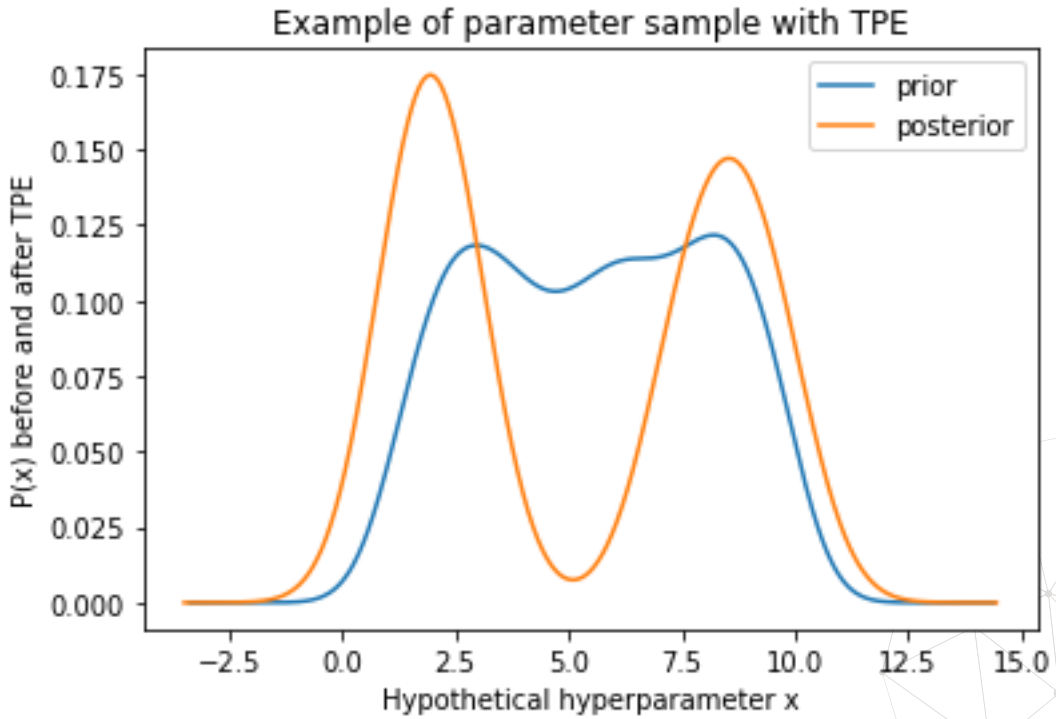
TPE - intuition

Approximate P(x | y) with surrogate function

$$P(y \mid x) = \frac{P(x \mid y) \times P(y)}{P(x)}$$

y is the score ➔ f(x)

x is the hyperparameters



Train In Data

THANK YOU

www.trainindata.com