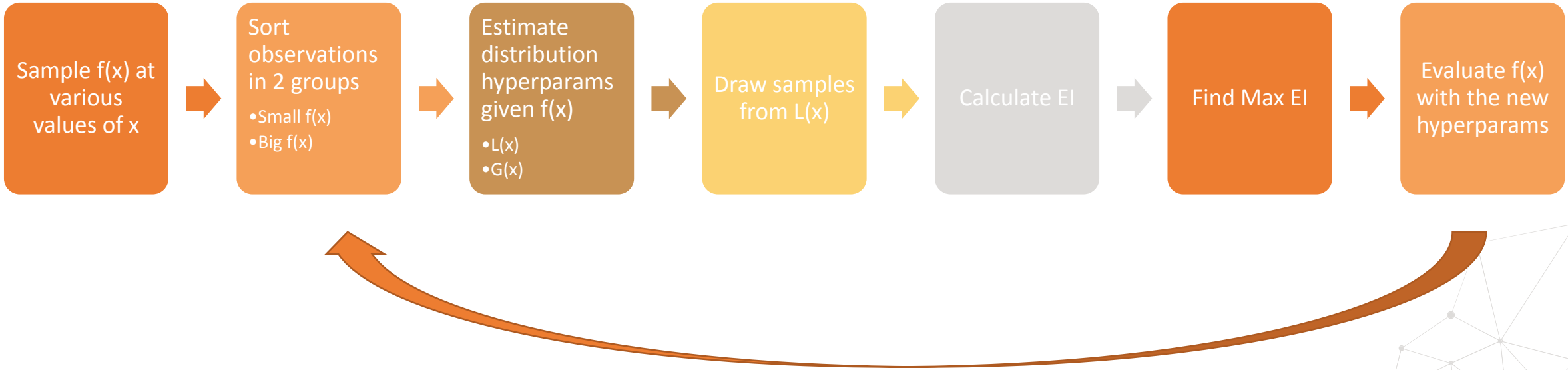
Train In Data

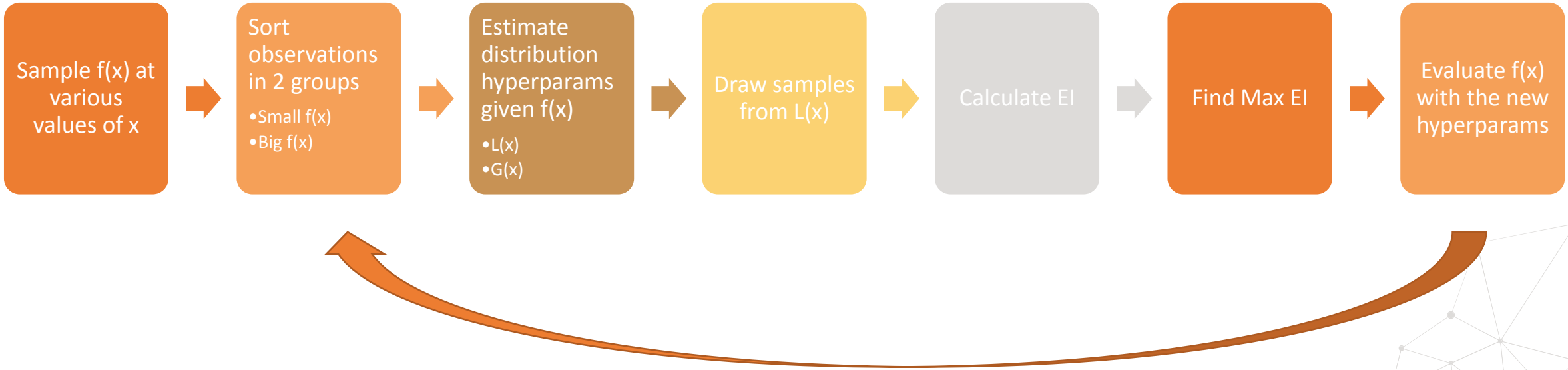
TPE

Default Parameters

TPE – Procedure



TPE – Procedure



How many?

At which quantile?

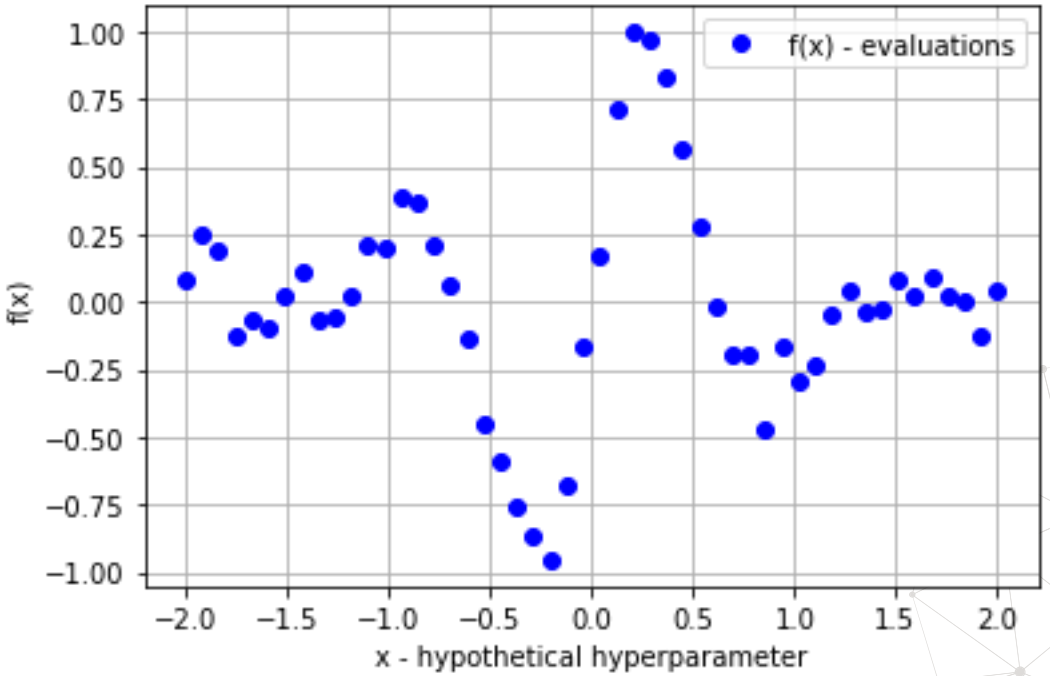
Parzen window size?

How many?

TPE – Step 1 – Sample f(x)

Evaluate f(x) at different values of the hyperparameters

How many hyperparameter values should we examine at random?

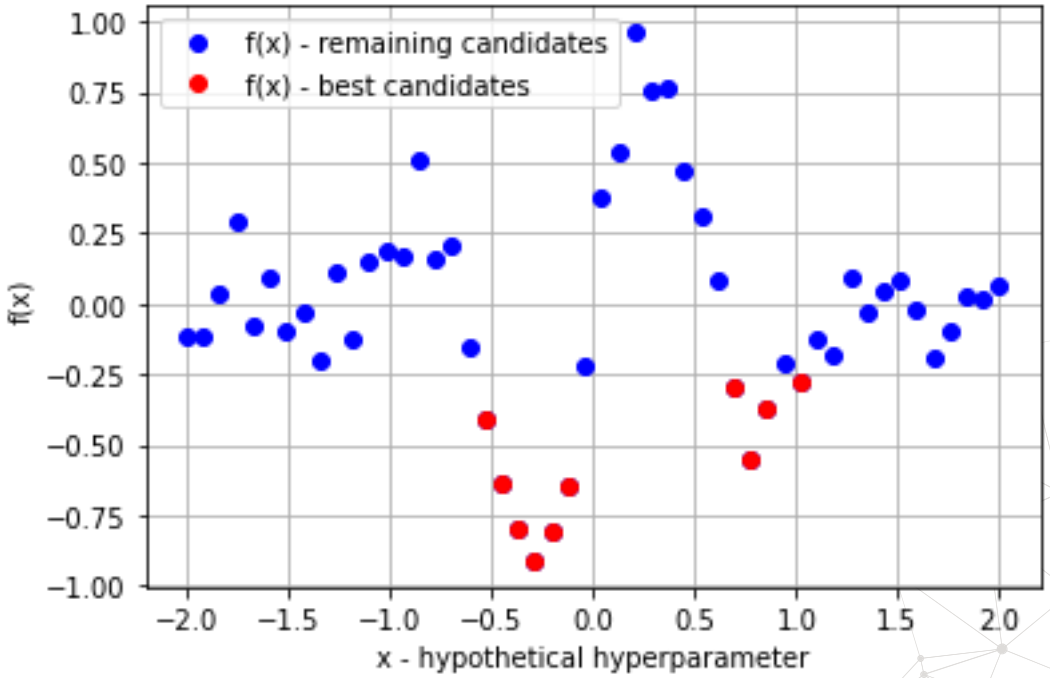


TPE – Step 2 – Divide observations

Separate observations in 2 groups:

How many observations should we send to group 1 (quantiles usually used, so which q)

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

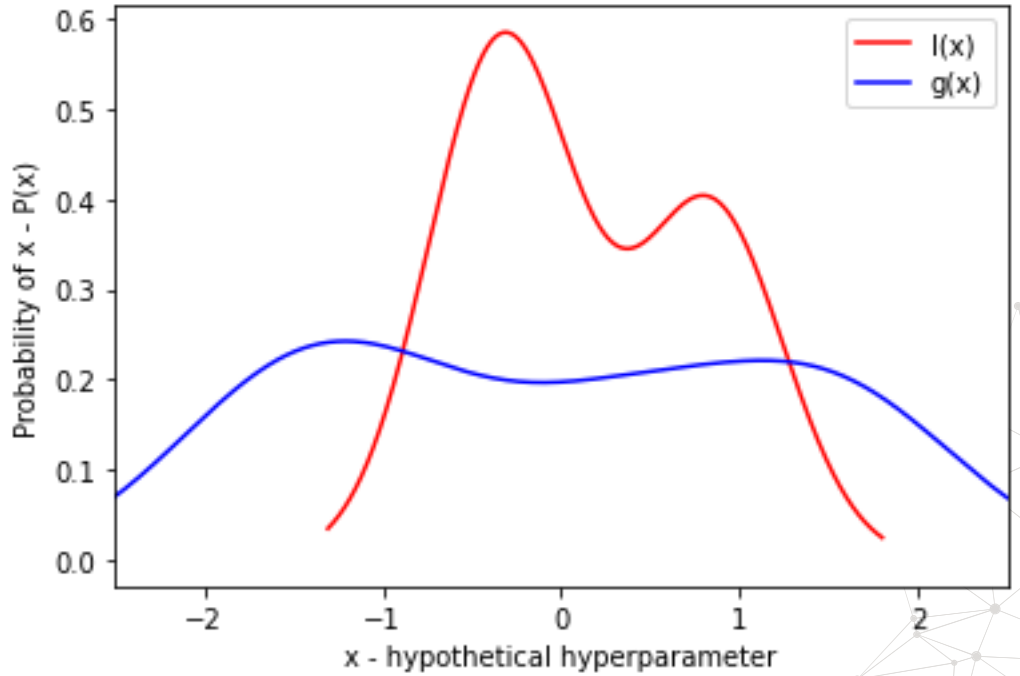


TPE – Step 3 – Estimate distribution of x

Estimate the distributions with

Parzen windows

Window size?



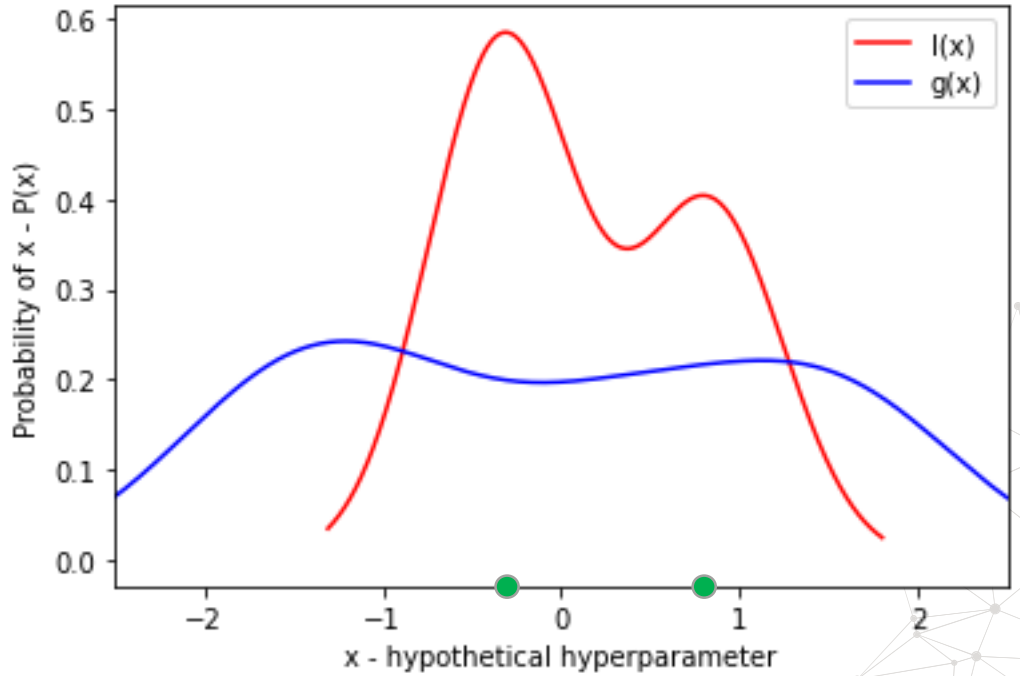
TPE – Step 4 – Estimate EI

Draw samples from L(x)

How many?

Determine EI

Find maximum EI



TPE.suggest

```
80
81  _default_prior_weight = 1.0
82
83  # -- suggest best of this many draws on every iteration
84  _default_n_EI_candidates = 24
85
86  # -- gamma * sqrt(n_trials) is fraction of to use as good
87  _default_gamma = 0.25
88
89  _default_n_startup_jobs = 20
90
```

```
830  def suggest(
831      new_ids,
832      domain,
833      trials,
834      seed,
835      prior_weight=_default_prior_weight,
836      n_startup_jobs=_default_n_startup_jobs,
837      n_EI_candidates=_default_n_EI_candidates,
838      gamma=_default_gamma,
839      verbose=True,
840  ):
```

https://github.com/hyperopt/hyperopt/blob/master/hyperopt/tpe.py#L780

TPE.suggest – change parameters

Quick example:

```
from functools import partial
from hyperopt import tpe, fmin

# ...

# this line effectively creates a new function that is the same as tpe.suggest but with some parameter values already set
algo = partial(tpe.suggest, n_startup_jobs=125, n_EI_candidates=50)

# pass in the new `algo` function that you created instead
best = fmin(fn=ae, space=parameterspace, algo=algo, trials=bayes_trials, max_evals=100)
```

https://github.com/hyperopt/hyperopt/issues/632

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THANK YOU

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