Algorithm 1 The GP-UCB algorithm.

Input: Input space D; GP Prior $\mu_0 = 0,\ \sigma_0,\ k$

for $t = 1, 2, \ldots$ **do**

Choose $\boldsymbol{x}_t = \underset{\boldsymbol{x} \in D}{\operatorname{argmax}}\, \mu_{t-1}(\boldsymbol{x}) + \sqrt{\beta_t}\sigma_{t-1}(\boldsymbol{x})$

Sample $y_t = f(\boldsymbol{x}_t) + \epsilon_t$

Perform Bayesian update to obtain μ_t and σ_t

end for