

Algorithm 8: ExtendedOCBA

Input : \vec{N}^{prev} , iterationNo, \mathcal{D} , acceptedCandSet = {cand₁, ..., cand_k};
 where $\forall_{i \in \{1, \dots, k\}}$ cand_i = (\vec{X}_i , O.m_i, O.sd_i, $\overrightarrow{SC.m_i}$, $\overrightarrow{SC.sd_i}$, N_i)

ConfigParams: noSimulations, budgetDelta

Output : \vec{N} , a vector of number of simulations allocated for each candidate

- 1 bestCand $\leftarrow \arg \min_{i \in \text{acceptedCandSet}} \text{O.m}_i$ s.t. $\forall_{i \in \mathcal{D}} P(SC.m_i \geq PB_i) \geq CB$
- 2 $\Theta_O \leftarrow \left\{ i \mid i \in \text{acceptedCandSet}, i \neq \text{bestCand}, \frac{(SC.m_{s,i} - PB_{s,i})}{SC.sd_{s,i}} \leq \frac{(O.m_i - O.m_{\text{bestCand}})}{O.sd_i} \right\}$
- 3 $\Theta_F \leftarrow \left\{ i \mid i \in \text{acceptedCandSet}, i \neq \text{bestCand}, \frac{(SC.m_{s,i} - PB_{s,i})}{SC.sd_{s,i}} > \frac{(O.m_i - O.m_{\text{bestCand}})}{O.sd_i} \right\}$
- 4 $\forall_{i \in \text{acceptedCandSet}} \eta_i \leftarrow \begin{cases} \frac{SC.sd_{s,i}}{(SC.m_{s,i} - PB_{s,i})} & \text{if } i \in \Theta_F \\ \frac{O.sd_i}{(O.m_i - O.m_{\text{bestCand}})} & \text{if } i \in \Theta_O \\ \frac{SC.sd_{s,\text{bestCand}}}{(SC.m_{s,\text{bestCand}} - PB_{s,\text{bestCand}})} & \text{if } i = \text{bestCand} \\ 0 & \text{otherwise} \end{cases}$
- 5 $\forall_{i \in \text{acceptedCandSet} \setminus \{\text{bestCand}\}} \alpha_i \leftarrow$ proportional to η_i , i.e., $(\alpha_i / \alpha_j) = (\eta_i / \eta_j)^2$
 for all $i \neq j \neq \text{bestCand}$
- 6 $\forall_{i \in \text{acceptedCandSet} \setminus \{\text{bestCand}\}} N_i \leftarrow \alpha_i (k \times \text{noSimulations} + \text{iterationNo} \times \text{budgetDelta})$
- 7 $\alpha_O \leftarrow O.sd_{\text{bestCand}} \sqrt{\sum_{i \in \Theta_O} (\alpha_i / O.sd_i)^2}$
- 8 $\alpha_F \leftarrow$ proportional to η_{bestCand} , i.e., $(\alpha_F / \alpha_i) = (\eta_{\text{bestCand}} / \eta_i)^2$ for all $i \neq \text{bestCand}$
- 9 $\alpha_{\text{bestCand}} \leftarrow \max(\alpha_F, \alpha_O)$
- 10 $\forall_{i \in \text{acceptedCandSet}} N_i \leftarrow$ Adjust the allocation for each candidate accordingly so that
 $\sum_{i=1}^k \max(0, (N_i - N_i^{prev})) = \text{budgetDelta}$
- 11 **return** \vec{N}