Algorithm 8: ExtendedOCBA

Input : $\overrightarrow{N^{prev}}$, iterationNo, $\mathcal{D}$, acceptedCandSet = $\{\text{cand}_1, \ldots, \text{cand}_k\}$;
where $\forall_{i\in\{1,\ldots,k\}}$ $\text{cand}_i = (\overrightarrow{X}_i, \text{O.m}_i, \text{O.sd}_i, \overrightarrow{SC.m_i}, \overrightarrow{SC.sd_i}, \text{N}_i)$

ConfigParams: noSimulations, budgetDelta

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

bestCand $\leftarrow \arg\min_{i\in acceptedCandSet}$ O.m$_i$ s.t. $\forall_{i\in\mathcal{D}}(SC.m_i \geq PB_i) \geq CB$

$\Theta_O \leftarrow \left\{i | i \in acceptedCandSet, i \neq bestCand, \frac{(SC.m_{s,i} - PB_{s,i})}{SC.sd_{s,i}} \leq \frac{(O.m_i - O.m_{bestCand})}{O.sd_i}\right\}$

$\Theta_F \leftarrow \left\{i | i \in acceptedCandSet, i \neq bestCand, \frac{(SC.m_{s,i} - PB_{s,i})}{SC.sd_{s,i}} > \frac{(O.m_i - O.m_{bestCand})}{O.sd_i}\right\}$

$$\forall_{i\in acceptedCandSet}\ \eta_i \leftarrow \begin{cases} \frac{SC.sd_{s,i}}{(SC.m_{s,i} - PB_{s,i})} & \text{if } i \in \Theta_F \\ \frac{O.sd_i}{(O.m_i - O.m_{bestCand})} & \text{if } i \in \Theta_O \\ \frac{SC.sd_{s,bestCand}}{(SC.m_{s,bestCand} - PB_{s,bestCand})} & \text{if } i = bestCand \\ 0 & \text{otherwise} \end{cases}$$

$\forall_{i\in acceptedCandSet\setminus\{bestCand\}}\ \alpha_i \leftarrow$ proportional to η_i, i.e., $(\alpha_i/\alpha_j) = (\eta_i/\eta_j)^2$ for all i $\neq$ j $\neq$ bestCand

$\forall_{i\in acceptedCandSet\setminus\{bestCand\}}\ N_i \leftarrow \alpha_i(k\times\ noSimulations\ +\ iterationNo\ \times\ budgetDelta)$

$\alpha_O \leftarrow O.sd_{bestCand}\sqrt{\sum_{i\in\Theta_O}(\alpha_i/O.sd_i)^2}$

$\alpha_F \leftarrow$ proportional to $\eta_{bestCand}$, i.e., $(\alpha_F/\alpha_i) = (\eta_{bestCand}/\eta_i)^2$ for all i $\neq$ bestCand

$\alpha_{bestCand} \leftarrow \max(\alpha_F, \alpha_O)$

$\forall_{i\in acceptedCandSet}\ N_i \leftarrow$ Adjust the allocation for each candidate accordingly so that $\sum_{i=1}^{k} max(0, (N_i - N_i^{prev})) = budgetDelta$

return $\overrightarrow{N}$