Pseudo-code Online hyper-heuristic evolutionary algorithm

initialize(P_t) at $t = 1$ ▷ Initialize new population
F_{E,P_t} = obj-and-const-calc(P_t) ▷ Expensive objective and constraint in P
D = cache(P_t, F_{E,P_t}) ▷ Store training data P and F into D
while not terminated **do**
    for all objective and constraint **do**
        compute FPC in P_t ▷ Surrogate model performance
        if FPC < 0.7 **then**
            update-model(D) ▷ Retrain model within the current generation
        end if
    end for
    S = make-new-pop(P_t) ▷ Create surrogate population S (with size $|S| > |P|$)
    F_S = obj-and-const-approx(S) ▷ Approximated objective and constraint in S
    S = rank(F_S, S) ▷ Rank individuals based on fitness values
    Q_t = extract(S) ▷ Pre-select Q individuals (with size $|Q| = |P|$)
    F_{E,Q_t} = obj-and-const-calc(Q_t) ▷ Expensive objective and constraint in Q
    $D = D \cup (Q_t, F_{E,Q_t})$ ▷ Add expensive evaluations into D
    $P_{t+1} = Q_t$ ▷ Assign Q as the next generation
    $t = t + 1$ ▷ Increase generation counter
end while