

## Algorithm 2 Differential Evolution

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1: determine objective function (OF)
2: assign number of generation to 0 ( $t=0$ )
3: randomly create individuals in initial population  $P(t)$ 
4: while termination criterion is not satisfied do
5:      $t=t+1$ 
6:     for each  $i$ -th individual in the population  $P(t)$  do
7:         randomly generate three integer numbers:
8:          $r_1, r_2, r_3 \in [1; \text{population size}]$ , where  $r_1 \neq r_2 \neq r_3 \neq i$ 
9:         for each  $j$ -th gene in  $i$ -th individual ( $j \in [1; n]$ ) do
10:             $v_{i,j} = x_{r_1,j} + F \cdot (x_{r_2,j} - x_{r_3,j})$ 
11:            randomly generate one real number  $rand_j \in$ 
[0; 1)
12:            if  $rand_j < CR$  then  $u_{i,j} := v_{i,j}$ 
13:            else
14:                 $u_{i,j} := x_{i,j}$ 
15:            end if
16:        end for
17:        if individual  $u_i$  is better than individual  $x_i$  then
18:            replace individual  $x_i$  by child  $u_i$  individual
19:        end if
20:    end for
21: end while
22: return the best individual in population  $P(t)$ 
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