

SHO GCP Algorithm

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January 2024

1 General Framework

Algorithm 1 Spotted Hyena Optimization for GCP

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1: procedure SHO_GCP( $G, Max_{itr}$ )
2:   Initialize Agents
3:   Calculate Fitness of Agents
4:    $Prey :=$  the fittest agent in  $Agents$ 
5:    $\tilde{h} := 5.0$ 
6:    $i := 0$ 
7:   while ( $Conflict_{Prey} \neq 0 \vee Color_{Prey} > Pre\_Color_{Prey}$ )  $\wedge (i \leq Max_{itr})$  do
8:      $\vec{C} := \vec{0}$ 
9:      $N := 0$ 
10:    for each  $Agent \in Agents$  do
11:      if  $Agent$  is better then
12:         $\vec{C} := \vec{C} + \vec{P}_{Agent}$ 
13:         $N := N + 1$ 
14:    for each  $Agent \in Agents$  do
15:      if  $Agent \neq Prey$  then
16:         $\vec{P}_{Agent} := \frac{\vec{C}}{N}$ 
17:    for each  $Agent \in Agents$  do
18:       $\vec{B} := 2 \cdot r\vec{d}_1$   $\triangleright r\vec{d}_1 \in [0, 1]$ 
19:       $\vec{D}_{Agent} := |\vec{B} \cdot \vec{P}_{Prey} - \vec{P}_{Agent}|$ 
20:    for each  $Agent \in Agents$  do
21:      if  $Agent \neq Prey$  then
22:         $\vec{E} := 2 \cdot \tilde{h} \cdot r\vec{d}_2 - \tilde{h}$   $\triangleright r\vec{d}_2 \in [0, 1]$ 
23:         $\vec{P}_{Agent} := \vec{P}_{Prey} - \vec{E} \cdot \vec{D}_{Agent}$ 
24:    Update fitness of all Agents
25:     $Prey :=$  the fittest agent in  $Agents$ 
26:     $\tilde{h} := 5 - \frac{5 \cdot i}{Max_{itr}}$ 
27:     $i := i + 1$ 
28:  return the coloration obtained by Prey
```
