

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