SHO GCP Algorithm

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1 General Framework

Algorithm 1 Spotted Hyena Optimization for GCP

procedure SHO_GCP(G, Max_{itr})
  Initialize Agents
  Calculate Fitness of Agents
  $S := \phi$ ▷ S is a set containing relatively fitter agents
  for each $Agent \in Agents$ **do**
    if Agent is considered relatively fitter **then**
      $S := S \cup Agent$
  $Prey :=$ the fittest agent in S
  $i := 0$
  while $\left(Conflict_{Prey} \neq 0 \vee Color_{Prey} \geq Pre\_Color_{Prey}\right) \wedge (i \leq Max_{itr})$ **do**
    $N := |S|$
    $\vec{C} := \vec{0}$
    for each $Agent \in S$ **do**
      $\vec{C} := \vec{C} + \vec{P}_{Agent}$
    for each $Agent \in Agents$ **do**
      $\vec{P}_{Agent} := \frac{\vec{C}}{N}$
    Identify any one Agent as Prey and rest as Hyenas
    $\vec{h} := 5 \cdot \frac{Max_{itr} - i}{Max_{itr} - 1}$
    for each $Agent \in Agents$ **do**
      $\vec{B} := 2 \cdot r\vec{d}_1$ ▷ $r\vec{d}_1 \in [0, 1]$
      $\vec{D}_{Agent} := \left|\vec{B} \cdot \vec{P}_{Prey} - \vec{P}_{Agent}\right|$
    for each $Agent \in Agents$ **do**
      $\vec{E} := 2 \cdot \vec{h} \cdot r\vec{d}_2 - \vec{h}$ ▷ $r\vec{d}_2 \in [0, 1]$
      $\vec{P}_{Agent} := \vec{P}_{Prey} - \vec{E} \cdot \vec{D}_{Agent}$
    update fitness of all Agents
    $S := \phi$
    for each $Agent \in Agents$ **do**
      if $Fitness_{Agent} \geq$ Acceptable Value **then**
        $S := S \cup Agent$
    $Prey :=$ the fittest agent in S
    $i := i + 1$
  return the coloration obtained by Prey