

**INPUT**

- $f$ : objective function
- $m$ : number of particles with  $x_i \in S$
- $u_i$ : number of velocities with  $u_i \in S$
- $x_i$ : number of positions in  $\Omega$ 
  - $w$ : inertia
  - $c1, c2$ : constant numbers
  - $r1, r2$ : random numbers
  - $iter$ : iteration counter
  - $iter_{max}$ : max iterations
- $p_i$ : vectors are best located values for every particle i

**OUTPUT**

-  $p_{best}$

**INITIALIZATION**

- **Set**  $iter \leftarrow 0$
- **Set** positions  $x_i \in S, i = 1.....m$
- **Set** velocities  $u_i, i = 1.....m$
- **For** each particle  $i \in \{1..m\}$  **do**

-  $p_i \leftarrow x_i$

- **End for**

-  $p_{best} \leftarrow argmin_i f(x_i)$  // global best

01 **while** generation < Gmax **do** // termination check

02     **For** each  $i \in \{1..m\}$  **do**

03         draw  $r1, r2 \sim U(0, 1)$

04          $u_i \leftarrow wu + c1r1(p_{best} - x_i) + c2r2(p_{best} - x_i)$  // update velocity

05          $x_i \leftarrow x_i + u_i$  // update position

06         **if**  $f(x_i) < f(p_i)$  **then**

07              $p_i \leftarrow x_i$

08         **End if**

09     **End for**

10          $p_{best} \leftarrow argmin_i f(x_i)$  // Update global best

11          $iter \leftarrow iter + 1$

12 **End while**