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01 input
02    $c_1, c_2, r_1, r_2, w, v_{min}, v_{max}$ 
03 output
04    $GB$ 
05   The fitness value of  $GB$ 
06 begin
07   Initialize Population
08   while (max iteration or convergence criteria is not met) do
09     for  $i = 1$  to numbers of particles
10       Evaluate fitness value of the particle by C4.5
11       if the fitness value of  $X_i$  is greater than that of  $PB_i$ 
12         then  $PB_i = X_i$ 
13       end if
14       if the fitness value of  $X_i$  is greater than that of  $GB$ 
15         then  $GB = X_i$ 
16       end if
17       for  $d = 1$  to no of genes
18          $v_{id}^{new} = w \times v_{id}^{old} + c_1 r_1 (pb_{id}^{old} - x_{id}^{old}) + c_2 r_2 (pb_d^{old} - x_{id}^{old})$ 
19         if  $v_{id}^{old} > v_{max}$  then  $v_{id}^{new} = v_{max}$ 
20         if  $v_{id}^{old} < v_{min}$  then  $v_{id}^{new} = v_{min}$ 
21         if  $sigmoid(v_{id}^{new}) > U(0,1)$ 
22           then
23              $x_{id}^{new} = 1$ 
24           else
25              $x_{id}^{new} = 0$ 
26         end if
27       next d
28     next i
29   end while
30 end

```

Set parameter values

Evaluate fitness of particle swarm

Update global best position
Update local best position

Update velocities
Update position