

After updating the algorithm, I change w from 1.4 to 1.4\*(ni-loop)/ni

Iteration:200

Result:

X=

0.0000 -0.0000

0.0167 0.0226

-0.1606 -0.2688

-0.4255 0.2607

0.0000 -0.0000

-0.0007 -0.0005

0.0000 -0.0000

0.0000 -0.0000

0.0000 -0.0000

0.0000 -0.0000

-0.1356 0.2290

0.0000 -0.0000

0.0000 -0.0000

-0.0155 0.1486

-0.0286 -0.0471

-0.0015 -0.0008

0.0000 -0.0000

0.0000 -0.0000

0.0000 -0.0000

0.0000 -0.0000

0.1401 0.1567

-0.0015 -0.0008

-0.0012 0.0017

-0.0924 0.0946

0.0000 -0.0000

-0.1580 0.0094

0.0000 -0.0000

-0.0000 -0.0000

0.0000 -0.0000

0.0077 -0.0917

0.0000 -0.0000

0.0000 -0.0000

-0.0021 -0.0003

0.0000 -0.0000

0.0000 -0.0000

-0.4150 -0.1589

-0.0039 -0.0031

0.0000 -0.0000

0.0000 -0.0000

0.0000 -0.0000

-0.0021 0.0015

0.0000 -0.0000

0.0000 -0.0000

0.0029 -0.0071

0.0000 -0.0000

0.1470 -0.4391

0.0049 -0.1106

0.0000 -0.0000

0.1349 0.1204

0.0411 0.1433

FX =

1.0e-005 \*

0.3339

-0.6381

Fmin =

1.0290e-008



FX =

1.0e-007 \*

-0.1171

0.7451

Fmin =

1.1280e-012

Sometimes it converges quicker

Updated Code

%Particle Swarm

%x1=[-5 5] x2=[-5 5]

%ploting

x1=linspace(-5,5,100);

x2=linspace(-5,5,100);

[X1,X2]=meshgrid(x1,x2);

f = @(x1,x2) 10\*2+(x1.^2-10\*cos(2\*pi\*x1))+(x2.^2-10\*cos(2\*pi\*x2));

f(X1,X2);

Z=f(X1,X2);

contour(X1,X2,Z,0:10:90)

title('Particle Swarm','FontWeight','bold','FontSize',20,'FontName','Times New Roman');

xlabel('X\_1','FontWeight','bold','FontSize',12,'FontName','Times New Roman');

ylabel('X\_2','FontWeight','bold','FontSize',12,'FontName','Times New Roman');

hold on

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%

f=@(x) 10\*2+(x(1)^2-10\*cos(2\*pi\*x(1)))+(x(2)^2-10\*cos(2\*pi\*x(2)));

p=50;%initial particles

X=[0;0];

v(1:2,1:p)=0;%initial v

w=1.4;

c1=2;

c2=2;

dt=1;

loop=1;

Temp=[0;0];

%initial X

for (i=1:p)

X(1,i)=rand(1)\*10-5;

X(2,i)=rand(1)\*10-5;

v(1,i)=(rand(1)\*10-5)/dt;

v(2,i)=(rand(1)\*10-5)/dt;%initial random v

i=i+1;

end

plot(X(1,:),X(2,:),'.')%PLOTING

hold on

Xo=X;

Temp=X(:,1);

for i=1:p

if f(X(:,i))<f(Temp)

Temp=X(:,i);

end

i=i+1;

end

Xg(1,1:p)=Temp(1,1);

Xg(2,1:p)=Temp(2,1);

%initial iteration and global opt

while loop<200

r1=rand(1);

r2=rand(1);

X=X+v\*dt;

%updating Xo

for i=1:p

if f(Xo(:,i))>f(X(:,i))

Xo(:,i)=X(:,i);

end

i=i+1;

end

for i=1:p

if f(X(:,i))<f(Xg(:,1))

Xg(1,1:p)=X(1,i);

Xg(2,1:p)=X(2,i);

end

i=i+1;

end

v=w\*v+c1\*r1\*(Xo-X)/dt+c2\*r2\*(Xg-X)/dt;

for (i=1:p)

F(i)=f(X(:,i));

i=i+1;

end

w=1.4\*(200-loop)/200;%dynamically

loop=loop+1;

if loop==100

plot(X(1,:),X(2,:),'+')

end

end

FX=Xg(:,1)

Fmin=f(Xg(:,1))

plot(X(1,:),X(2,:),'\*')%PLOTING

hold on