CODE FOR OPTIMISATION OF MRR:

clear all

Vmin=300;

Vmax=600;

Fmin=0.15;

Fmax=0.25;

Dmin=0.50;

Dmax=1.00;

p=10;

N=50;

for i=1:p

V(i)=Vmin + rand\*(Vmax-Vmin);

F(i)=Fmin +rand\*(Fmax-Fmin);

D(i)=Dmin + rand\*(Dmax-Dmin);

MRR(i)=-0.023+0.000203\*V(i)+0.14\*F(i)+0.001\*D(i)-0.0\*V(i)^2-1.40\*F(i)^2-0.152\*D(i)^2-0.00033\*V(i)\*F(i)+0.000213\*V(i)\*D(i)+0.760\*F(i)\*D(i);

end

V;

F;

D;

MRR;

MRRbest=max(MRR);

MMRworst=min(MRR);

for i=1:p

if MRR(i)==MRRbest

k=i;

break;

end

end

for i=1:p

if MRR(i)==MMRworst

j=i;

break;

end

end

Vbest=V(k);

Vworst=V(j);

Fbest=F(k);

Fworst=F(j);

Dbest=D(k);

Dworst=D(j);

for n=1:N

for i=1:p

Vn(i)=V(i)+rand\*(Vbest-V(i))-rand\*(Vworst-V(i));

Fn(i) = F(i) + rand\*(Fbest - F(i)) - rand\*(Fworst - F(i));

Dn(i) = D(i) + rand\*(Dbest - D(i)) - rand\*(Dworst - D(i));

if Vn(i)<Vmin

Vn(i) = Vmin;

elseif Vn(i)> Vmax

Vn(i)= Vmax;

end

if Fn(i)< Fmin

Fn(i) = Fmin;

elseif Fn(i)>Fmax

Fn(i)= Fmax;

end

if Dn(i)< Dmin

Dn(i) = Dmin;

elseif Dn(i)>Dmax

Dn(i)= Dmax;

end

MRRn(i) = -0.023 + 0.000203\*Vn(i) + 0.14\*Fn(i) +0.001\*Dn(i) - 0.0\*Vn(i)^2 - 1.40\*Fn(i)^2 - 0.152\*Dn(i)^2 -0.00033\*Vn(i)\*Fn(i) + 0.000213\*Vn(i)\*Dn(i) +0.760\*Fn(i)\*Dn(i);

if MRRn(i)<MRR(i)

MRRn(i)= MRR(i);

Vn(i) = V(i);

Fn(i) = F(i);

Dn(i) = D(i);

end

end

Vn;

Fn;

Dn;

MRRn;

MRRnbest=max(MRRn);

MRRnworst=min(MRRn);

for i=1:p

if MRRn(i)==MRRnbest

k=i;

break;

end

end

for i=1:p

if MRRn(i)==MRRnworst

j=i;

break;

end

end

Vbest = Vn(k);

Vworst = Vn(j);

Fbest = Fn(k);

Fworst = Fn(j);

Dbest = Dn(k);

Dworst = Dn(j);

V = Vn;

F = Fn;

D = Dn;

MRR = MRRn;

FF(n) = MRRnbest;

itn(n) = n;

end

fprintf('the best value is %.2f',MRRnbest)

% Plot the graph of RA in each iteration

figure;

plot(itn, FF);

xlabel('Iteration');

ylabel('MRR');

title('MRR vs. Iteration');