2021-11-30

Implement the algorithm for preference list and implement test to simulation for interference power at D2D links in different situation.

```
function[partner_CUE,partner_D2D]=preference(EE,PD,lambda,SiD,EhaD)
syms pkc hD h_interference Pir PR hB_rayleigh dB
sort(EE,'descend');
for i=1:size(EhaD,2)
    for k=1:size(SiD,2)
        Throughput_temp=Throughput_D(lambda(i),PD(i),pkc,h_interference(i,k),hD(i));
        EH_temp=Eenergy_harvesting(PR(i));
        EC_temp=Energy_Consumption(PD(i),Pir,EH_temp);
        EE_temp=Throughput_temp/EC_temp;
        if EE_temp==EE(i)
            partner_D2D(i,k)=SiD(k);
        else
            %zero means for current segment k of CUE, it can not let D2D
            %link i achieve its maximum value of EE.
            partner_D2D(i,k)=0;
        end
    end
end

M = containers.Map('KeyType','double','ValueType','int32');
%first
for k=1:size(SiD,2)
    for i=size(EhaD,2)
        h_interference(i)=dB(i)*PD(i)*hB_rayleigh(i);
        M=containers.Map(h_interference(i), EhaD(i));
    end
    h_interference(k,:)=sort(h_interference(k,:));
end
for k=1:size(SiD,2)
    for i=size(EhaD,2)
        link=M(h_interference(i));
        partner_CUE(k,i)=link;
    end
end
end
```

Test for partner selection

```
M = containers.Map('KeyType','double','ValueType','int32');
test=rand(1,10);
for i=1:size(test,2)
    M(test(i))=i;
end
test=sort(test);
```