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1 clc;
2 clear all;
3 close all;
4
5 % Taking user input.
6
7 disp('Enter the data for the mu mimo single downlink system----');
8 NumOfTransmitAntennas1 = input('\nEnter the values for number of transmit antenna
Nt:');
9 NumOfReceiveAntennasPerUser1 = input('\nnumber of receive antennas per user Nr:');
10 VarianceSql = input('\nEnter the value for the variance square for the complex
gaussian zero mean random variables :');
11
12 % plotting SUMCAPACITY versus NUMBER OF USERS plot.
13
14 user2 = zeros(1,21);
15 SumCapacityArr1 = zeros(1,21);
16 SumCapacityArr2 = zeros(1,21);
17 for SNRindB2=[0 10 20 30]
18     for iteration = 1:1000
19         for K=1:21
20             user2(K)=K-1;
21             [ SumCapacity1,SelectedReceiveAntenna1,SelectedUser1,DataStreams1 ] =
SuboptimalAlgorithm1Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
22             [ SumCapacity2,SelectedReceiveAntenna2,SelectedUser2,DataStreams2 ] =
SuboptimalAlgorithm2Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
23             SumCapacityArr1(K) = SumCapacityArr1(K)+ SumCapacity1;
24             SumCapacityArr2(K) = SumCapacityArr2(K) + SumCapacity2;
25         end
26     end
27     SumCapacityArr1 = SumCapacityArr1/1000;
28     SumCapacityArr2 = SumCapacityArr2/1000;
29
30     figure(1)
31     plot(user2,SumCapacityArr1,'b-*','linewidth',2)
32     hold on
33     plot(user2,SumCapacityArr2,'r-*','linewidth',2)
34     title('sumcapacity vs number of users');
35     xlabel('number of users');
36     ylabel('sum capacity');
37     legend('SA1','SA2','location','northwest')
38     hold on
39     grid on
40 end
41 hold off;
42
43 % plotting SUMCAPACITY versus SNRdB plot.
44
45 snr1 = zeros(1,41);

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46 SumCapacityArr1 = zeros(1,41);
47 SumCapacityArr2 = zeros(1,41);
48 x= 2;
49 for NumOfUsers1 = [5 10 15 20]
50 for iteration = 1:1000
51     K=1;
52     for SNRdB1 = -10:30
53
54         snr1(K) = SNRdB1;
55
56         [ SumCapacity1,SelectedReceiveAntennal,SelectedUser1,DataStreams1 ] ←
SuboptimalAlgorithm1Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,NumOfUsers1,SNRdB1);
57         [ SumCapacity2,SelectedReceiveAntenna2,SelectedUser2 ,DataStreams2 ] ←
SuboptimalAlgorithm2Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,NumOfUsers1,SNRdB1);
58
59         SumCapacityArr1(K) = SumCapacityArr1(K) + SumCapacity1;
60         SumCapacityArr2(K) = SumCapacityArr2(K) + SumCapacity2;
61
62         K=K+1;
63     end
64 end
65 SumCapacityArr1 = SumCapacityArr1/1000;
66 SumCapacityArr2 = SumCapacityArr2/1000;
67
68 figure(x)
69 plot(snr1, SumCapacityArr1,'b-*','linewidth',2)
70 hold on
71 plot(snr1, SumCapacityArr2,'r-*','linewidth',2)
72 title('sumcapacity vs SNRdB');
73 xlabel('SNRdB');
74 ylabel('sum capacity');
75 legend('SA1','SA2','location','northwest')
76 grid on
77 hold off;
78 x = x+1;
79 end
80 %-----END OF PROGRAME-----
```