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load('chal_64_100000_bi.mat');
% 100000 * 64
lol = C;
challenge_set = C;
challenge_set(1:100000,65) = ones(100000,1);
% making bipolar
for i = 1:100000
    for j = 1:64
        if lol(i,j) == 0
            lol(i,j) = 1;
        else
            lol(i,j) = -1;
        end
    end
end
end
% calculating parity vectors
for i = 1:100000
    for j = 1:64
        hi = 1;
        % if j == 64
        % challenge_set(i,j) = 1;
        % else
        for k = j:64
            hi = hi * lol(i,k);
        end
        challenge_set(i,j) = hi;
    end
end
end
clear C;
clear lol;
% %
load('respGolden_10_APUF_64_100000_Br_5.mat');
response_set = G;
for i = 1:100000
    for j = 1:10
        if response_set(i,j) == 0
            response_set(i,j) = 1;
        else
            response_set(i,j) = -1;
        end
    end
end
end
clear G;

% setting training and classifying data
training_set_features = challenge_set(1:70000,:);
training_set_groups0 = response_set(1:70000,1).*response_set(1:70000,7);
training_set_groups1 = response_set(1:70000,1).*response_set(1:70000,2);

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training_set_groups2 = response_set(1:70000,2).*response_set(1:70000,3);
training_set_groups3 = response_set(1:70000,3).*response_set(1:70000,4);
training_set_groups4 = response_set(1:70000,4).*response_set(1:70000,5);
training_set_groups5 = response_set(1:70000,5).*response_set(1:70000,6);

classify_set_features = challenge_set(70001:100000,:);
classify_set_groups0 = response_set(70001:100000,1).*response_set(70001:100000,7);
classify_set_groups1 = response_set(70001:100000,1).*response_set(70001:100000,2);
classify_set_groups2 = response_set(70001:100000,2).*response_set(70001:100000,3);
classify_set_groups3 = response_set(70001:100000,3).*response_set(70001:100000,4);
classify_set_groups4 = response_set(70001:100000,4).*response_set(70001:100000,5);
classify_set_groups5 = response_set(70001:100000,5).*response_set(70001:100000,6);

diary('first_part_exp.txt');
diary on;

% % radial kernel
% % training_set_features from first
S=sprintf('<=====Radial
Kernel=====>');
disp(S);
    training_set_groups_1 = training_set_groups0(1:70000);    % actual training data
    model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

    S=sprintf('Accuracy for v[0] ==>');
    disp(S);

    classify_set_groups_1 = classify_set_groups0(1:30000,1);    % actual classifying data
    [predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
    v0=predicted_label;
    %-----
    training_set_groups_1 = training_set_groups1(1:70000);    % actual training data
    model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

    S=sprintf('Accuracy for v[1] ==>');
    disp(S);

    classify_set_groups_1 = classify_set_groups1(1:30000,1);    % actual classifying data
    [predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
    v1=predicted_label;
    %-----
    training_set_groups_1 = training_set_groups2(1:70000);    % actual training data
    model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

    S=sprintf('Accuracy for v[2] ==>');
    disp(S);

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classify_set_groups_1 = classify_set_groups2(1:30000,1); % actual classifying data
[predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
v2=predicted_label;
%-----
training_set_groups_1 = training_set_groups3(1:70000); % actual training data
model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

S=sprintf('Accuracy for v[3] ==>');
disp(S);

classify_set_groups_1 = classify_set_groups3(1:30000,1); % actual classifying data
[predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
v3=predicted_label;
%-----
training_set_groups_1 = training_set_groups4(1:70000); % actual training data
model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

S=sprintf('Accuracy for v[4] ==>');
disp(S);

classify_set_groups_1 = classify_set_groups4(1:30000,1); % actual classifying data
[predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
v4=predicted_label;
%-----
training_set_groups_1 = training_set_groups5(1:70000); % actual training data
model = svmtrain(training_set_groups_1, training_set_features, '-t 2'); % radial

S=sprintf('Accuracy for v[5] ==>');
disp(S);

classify_set_groups_1 = classify_set_groups5(1:30000,1); % actual classifying data
[predicted_label, accuracy, decision_values] = svmpredict(classify_set_groups_1,
classify_set_features, model);
v5=predicted_label;
%now % of o[0], o[1]....
%first original values of o[i]
o0 =
response_set(70001:100000,1).*response_set(70001:100000,2).*response_set(70001:100000,3).*respo
nse_set(70001:100000,4).*response_set(70001:100000,5).*response_set(70001:100000,6);

o1=response_set(70001:100000,7).*response_set(70001:100000,2).*response_set(70001:100000,3).*re
sponse_set(70001:100000,4).*response_set(70001:100000,5).*response_set(70001:100000,6);

o2=response_set(70001:100000,1).*response_set(70001:100000,7).*response_set(70001:100000,3).*re
sponse_set(70001:100000,4).*response_set(70001:100000,5).*response_set(70001:100000,6);

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o3=response_set(70001:100000,1).*response_set(70001:100000,2).*response_set(70001:100000,7).*response_set(70001:100000,4).*response_set(70001:100000,5).*response_set(70001:100000,6);

o4=response_set(70001:100000,1).*response_set(70001:100000,2).*response_set(70001:100000,3).*response_set(70001:100000,7).*response_set(70001:100000,5).*response_set(70001:100000,6);

o5=response_set(70001:100000,1).*response_set(70001:100000,2).*response_set(70001:100000,3).*response_set(70001:100000,4).*response_set(70001:100000,7).*response_set(70001:100000,6);
%obtained response
O0=v1.*v3.*v5;
O1=v0.*v1.*v3.*v5;
O2=v0.*v3.*v5;
O3=v0.*v2.*v3.*v5;
O4=v0.*v2.*v5;
O5=v0.*v2.*v4.*v5;
% %accuracy now
disp(sum(o0==O0)/30000);
disp(sum(o1==O1)/30000);
disp(sum(o2==O2)/30000);
disp(sum(o3==O3)/30000);
disp(sum(o4==O4)/30000);
disp(sum(o5==O5)/30000);
diary off;

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