

Apéndice A

Códigos en MATLAB

A.1. Boosting

```
clear
clc
filedata1 = struct2cell(load('LlantosHambre.mat'));
filedata2 = struct2cell(load('LlantosDolor'));
filedata3 = struct2cell(load('LlantoAsfixN'));
Filedata1 = filedata1,1;
Filedata2 = filedata2,1;
Filedata3 = filedata3,1;
DataHambre = Filedata1(:,1:end-450);
DataDolor = Filedata2(1:end,1:end-50);
LabelsH = zeros(1,2000);
LabelsD = zeros(1,2000);
for o=1:2000
    LabelsH(o)=1;
end
for p=1:2000
    LabelsD(p)=-1;
end
MaxIter = 100;
Maxsplits = 30;
treesplits =1:Maxsplits;
AccuracyA= zeros(1,Maxsplits);
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ErrorA = zeros(1,Maxsplits);
AccuracyANL= zeros(1,Maxsplits);
ErrorANL = zeros(1,Maxsplits);
TrainData= [DataHambre(1:10,1:end*.6) DataDolor(1:10,1:(end*.6))];
TrainLabels = [LabelsH(:,1:end*.6) LabelsD(:,1:end*.6)];
ControlData = [DataHambre(1:10,(end*.6)+1:end) DataDolor(1:10,(end*.6)+1:end-
400)];
ControlLabels = [LabelsH(:,(end*.6)+1:end) LabelsD(:,(end*.6)+1:end-400)];
TrainDataNL = [DataHambre(1:11,1:end*.6) DataDolor(1:11,1:(end*.6))];
TrainLabelsNL = [LabelsH(:,1:end*.6) LabelsD(:,1:end*.6)];
ControlDataNL = [DataHambre(1:11,(end*.6)+1:end) DataDolor(1:11,(end*.6)+1:end-
400)];
ControlLabelsNL = [LabelsH(:,(end*.6)+1:end) LabelsD(:,(end*.6)+1:end-400)];
tic
for l=1:Maxsplits
MABcontrolerror = zeros(1, MaxIter);
MABcontrolerrorNL = zeros(1, MaxIter);
weaklearner = treenodew(1);
weaklearnerNL = treenodew(1);
NuLearners = [];
NuWeights = [];
NuLearnersNL = [];
NuWeightsNL = [];
for lrnnum = 1 : MaxIter
clc;
disp(strcat('Boosting step: ', num2str(lrnnum),'/', num2str(MaxIter), '. Tree Splits: ',
num2str(l),'/', num2str(Maxsplits)));
[NuLearners, NuWeights] = ModestAdaBoost(weaklearner, TrainData, TrainLabels,
1, NuWeights, NuLearners);
[NuLearnersNL, NuWeightsNL] = ModestAdaBoost (weaklearnerNL, TrainDataNL,
TrainLabelsNL, 1, NuWeightsNL, NuLearnersNL);
NuControl = sign(Classify(NuLearners, NuWeights, ControlData));
NuControlNL = sign(Classify(NuLearnersNL, NuWeightsNL, ControlDataNL));
MABcontrolerror(lrnnum) = MABcontrolerror(lrnnum) + sum(NuControl = Contro-
lLabels) / length(ControlLabels);
MABcontrolerrorNL(lrnnum) = MABcontrolerrorNL(lrnnum)+sum(NuControlNL =
ControlLabelsNL)/length(ControlLabelsNL);
if lrnnum == MaxIter
contadorA=0;
CerrorMA = 0;
for j=1:size(NuControl,2)
if NuControl(j)==1
contadorA=contadorA+1;
end

```

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end
for k=1:size(NuControl,2)
if NuControl(k)==1
if(ControlLabels(k) = NuControl(k)) == 0
CerrorMA = CerrorMA+1;
end
end
end
end
if lrnnum == MaxIter
contadorANL=0;
CerrorMANL = 0;
for j=1:size(NuControlNL,2)
if NuControlNL(j)==1
contadorANL=contadorANL+1;
end
end
for k=1:size(NuControlNL,2)
if NuControlNL(k)==1
if(ControlLabelsNL(k) = NuControlNL(k)) == 0
CerrorMANL = CerrorMANL+1;
end
end
end
end
end
AccuracyA(1) = CerrorMA/contadorA;
ErrorA(1)= (contadorA-CerrorMA)/contadorA;
AccuracyANL(1) = CerrorMANL/contadorANL;
ErrorANL(1)= (contadorANL-CerrorMANL)/contadorANL;
end
disp(strcat('Accuracy Hunger Cries: '));
disp(AccuracyA);
disp(strcat('Error Hunger Cries : '));
disp(ErrorA);
disp(strcat('Accuracy Hunger Cries NL: '));
disp(AccuracyANL);
disp(strcat('Error Hunger Cries NL : '));
disp(ErrorANL);
toc
plot(treesplits,AccuracyA,'LineWidth',2);
grid on
hold on
plot(treesplits,AccuracyANL,'r','LineWidth',2);

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```
axis([0 30 .45 .6]);  
legend('Only linear features', 'With non-linear  
features', 'Location', 'SouthEast');  
title('Modest AdaBoost algorithm performance graph, Hunger cries');  
xlabel('Weak classifiers numbers');  
ylabel('Accuracy performance');
```