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DEPARTMENT: COMPUTER ENGINEERING

commandwindow

clearvars

clc

close all

format short g

syms x t Kp Td Tp

%LINEARIZED REGRESSION METHOD

v= Kp\*(1-exp(-((t-Td)/Tp)));

cat=xlsread('1587203818odevbesdata','data1');

t1=cat(:,1);

v=cat(:,2);

V=round(mdata(900,2),1);

t0=ones(length(v),1);

t=[t0 t1];

[mcoeff, mcoeffint, mrseid, mresidint, manova]=regress(v,t1);

mcoeff

manova

Kp=V

Td=-mcoeff(1)

Tp=mcoeff(2)

figure(1)

plot(t1,v)

hold on

plot(t1,V,'red-o')

grid on

grid minor

xlabel('Time(min)')

ylabel('Volume(m^3)')

legend('Experimental','Linearized')

%NON-LINEAR REGRESSION METHOD

ig=[0.1,0.1,0.1,0.1];

modelfun=@(v,t) ig(1)\*(1-exp(-((ig(2)-ig(3))/ig\*4))));

dog=nlinfit(t1,v,ig,modelfun)

figure(2)

plot(t1,v,'blue-o')

hold on

plot(t1,dog)

grid on

grid minor

xlabel('Time(min)')

ylabel('Volume(m^3)')

legend('Experimental','Nonlinear')

%COMPARISON BETWEEN LINEARIZED AND NONLINEAR REGRESSION

figure(3)

plot(t1,V)

hold on

plot(t1,v)

hold on

plot(t1,dog)

grid minor

grid on

xlabel('Time(min)')

ylabel('Volume(m^3)')

legend('Experimental','Linearized','Nonlinear')

%SUM OF ABSOLUTE ERRORS

[v,t1]=simplefit\_data1;

net=fitnet(10.'trainscg');

net.performFcn= 'SAE';

net= train(net,x,t)

y=net(x)

e=t1-y

perf= SAE(net,t,y)

%MEAN OF ABSOLUTE ERRORS

y=net(v)

e=t-y

perf= MAE(e)