function dcmotor

clear all;

ser = serial('COM1');

set(ser, 'Terminator','CR/LF');

set(ser, 'BaudRate', 115200);

set(ser, 'DataBits', 8);

set(ser, 'Parity', 'none');

set(ser, 'Timeout', 10);

set(ser, 'StopBits', 1);

fopen(ser); % open the serial port connection

ser.ReadAsyncMode = 'continuous';

readasync(ser);

fprintf('DC motor FPGA controller is on-line.\n');

x1=0;x2=0;x3=0;d=0;

v=0;vi=0;

final=5000;

xset=[(pi/3)\*ones(1,final) -(pi/3)\*ones(1,final)];

k=1:100:final;

j=0;

x3plot=zeros(1,final);

xsetplot=zeros(1,final);

for i=1:length(xset)

j=j+1;

x1=0.9668\*x1-0.0131\*x2+0.0098\*v-d;

x2=0.0010\*x1+x2;

x3=0.0010\*x2+x3;

x3plot(i)=x3;

xsetplot(i)=xset(i);

fprintf(ser,num2str(xset(i)));

fprintf(ser,num2str(x3));

v=str2double(fscanf(ser,'%s'));

end

figure(1);plot(1:i,xsetplot,'r',1:i,x3plot,'b');

fclose(ser);

clear ser;