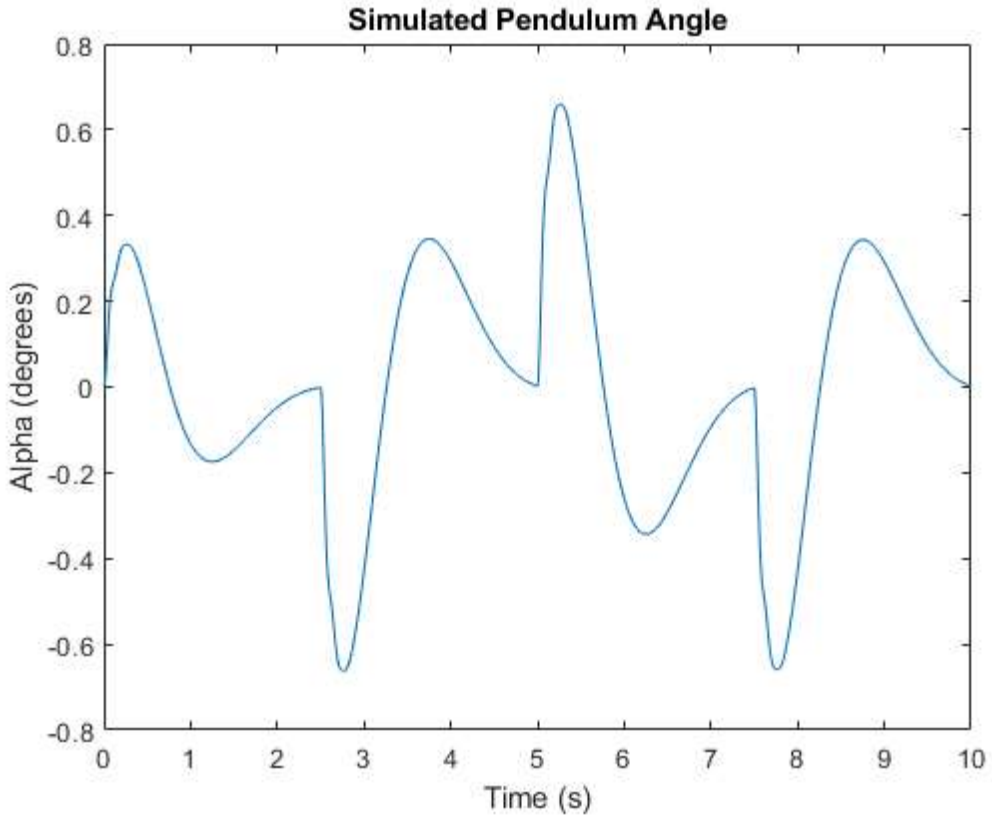
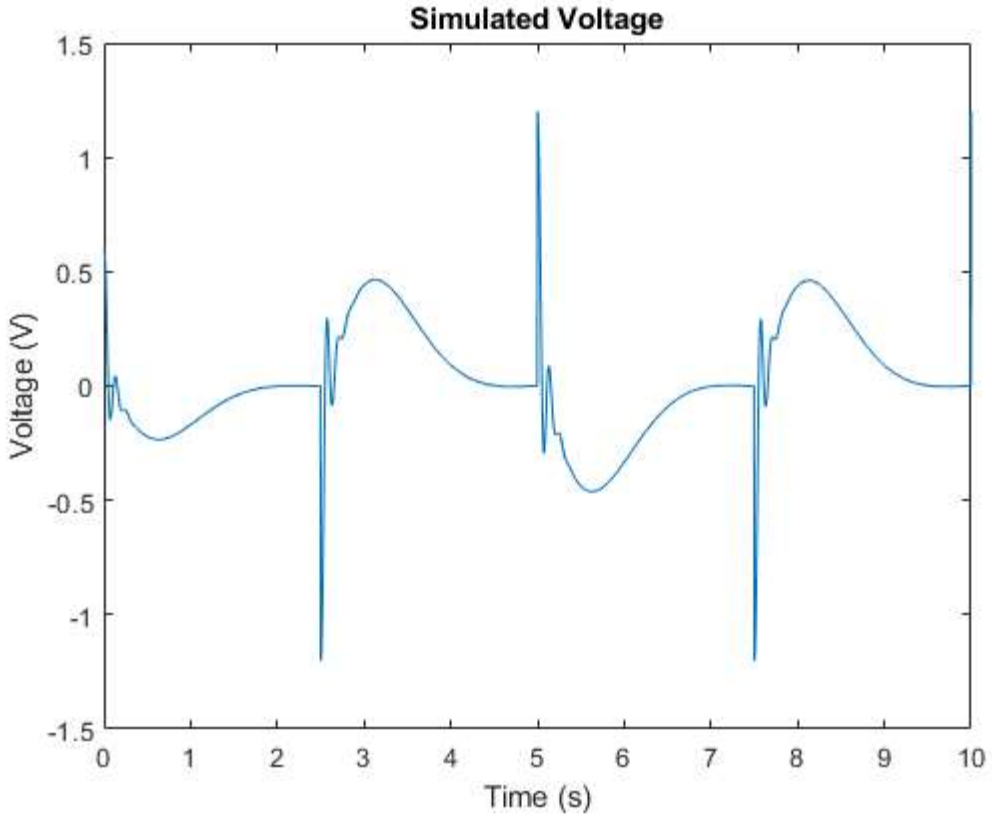
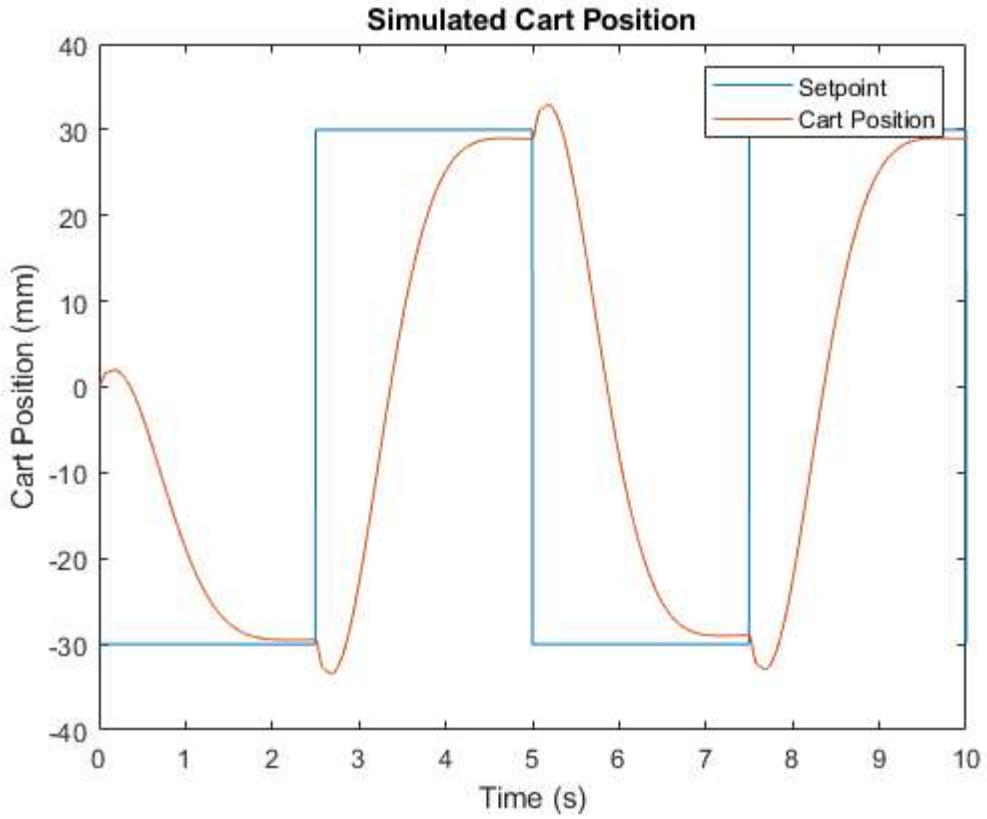
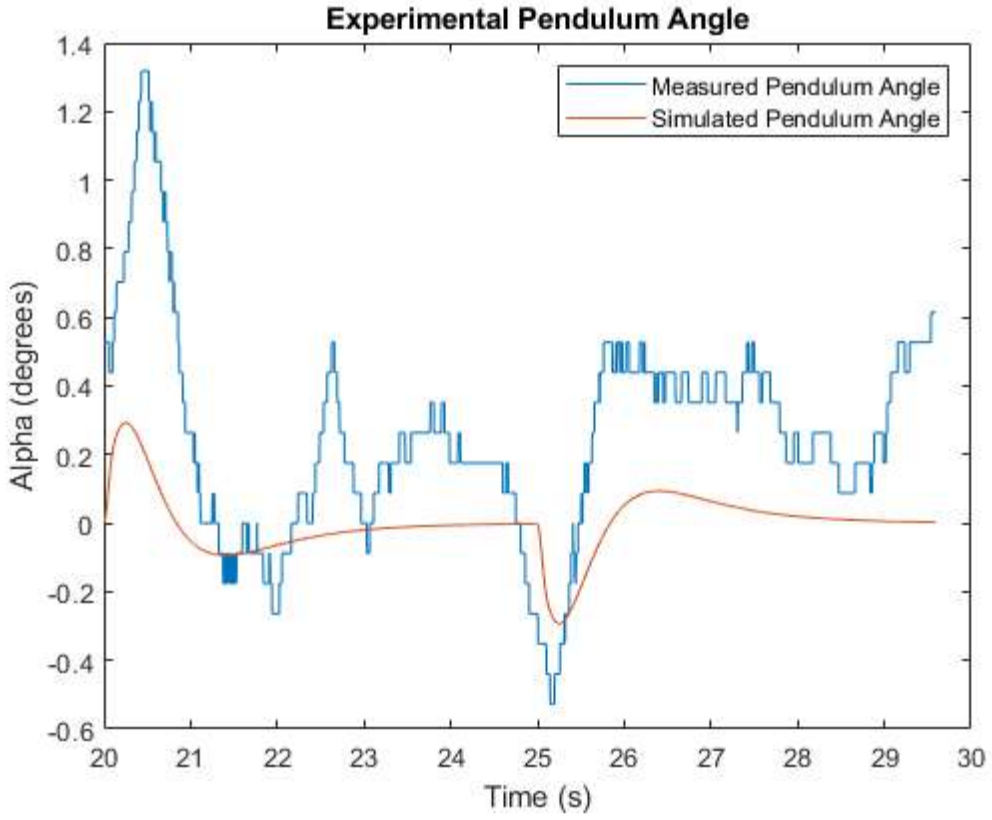
```
% Teagan Kilian
% MEE 416
% Lab 3.1

% Simulation
figure (1)
t_a1 = data_alpha1(:,1);
alpha1 = data_alpha1(:,2);
plot(t_a1,alpha1)

title ("Simulated Pendulum Angle")
xlabel ("Time (s)")
ylabel ("Alpha (degrees)")

figure (2)
t_vm1 = data_vm1(:,1);
vm1 = data_vm1(:,2);
plot(t_vm1,vm1)

title ("Simulated Voltage")
xlabel ("Time (s)")
ylabel ("Voltage (V)")

figure (3)
t_xc1 = data_xc1(:,1);
xc1 = data_xc1(:,2);
plot(t_xc1,xc1)
hold on

xc12 = data_xc1(:,3);
plot(t_xc1,xc12)

title ("Simulated Cart Position")
xlabel ("Time (s)")
ylabel ("Cart Position (mm)")
legend ("Setpoint", "Cart Position")

% Experiment
figure (4)
t_a4 = data_alpha4(:,1);
alpha4 = data_alpha4(:,2);
plot(t_a4,alpha4)

hold on

alpha42 = data_alpha4(:,3);
plot(t_a4,alpha42)

legend ("Measured Pendulum Angle", "Simulated Pendulum Angle")

title ("Experimental Pendulum Angle")
xlabel ("Time (s)")
ylabel ("Alpha (degrees)")

figure (5)
t_vm4 = data_vm4(:,1);
vm4 = data_vm4(:,2);
plot(t_vm4,vm4)
```

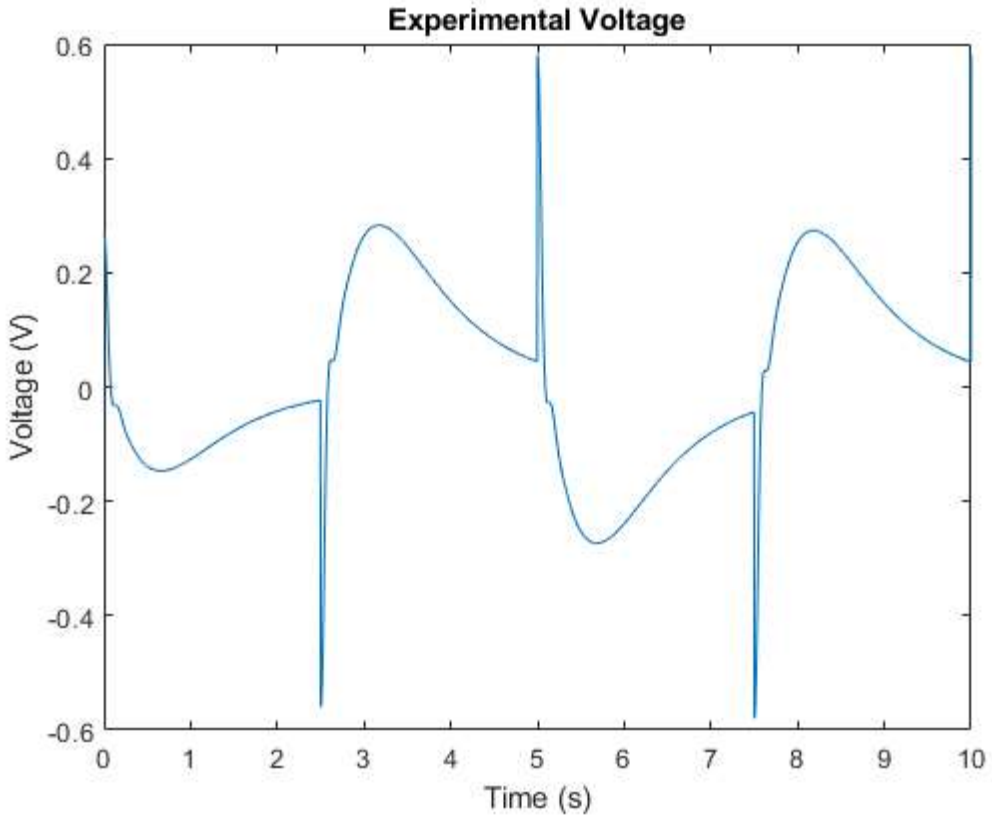
```
title ("Experimental Voltage")
xlabel ("Time (s)")
ylabel ("Voltage (V)")

figure (6)
t_xc4 = data_xc4(:,1);
xc4 = data_xc4(:,2);
plot(t_xc4,xc4)
hold on

xc42 = data_xc4(:,3);
plot(t_xc4,xc42)

xc43 = data_xc4(:,4);
plot(t_xc4,xc43)

title ("Experimental Cart Position")
xlabel ("Time (s)")
ylabel ("Cart Position (mm)")
legend ("Setpoint", "Measured Cart Position", "Simulated Cart Position")
```

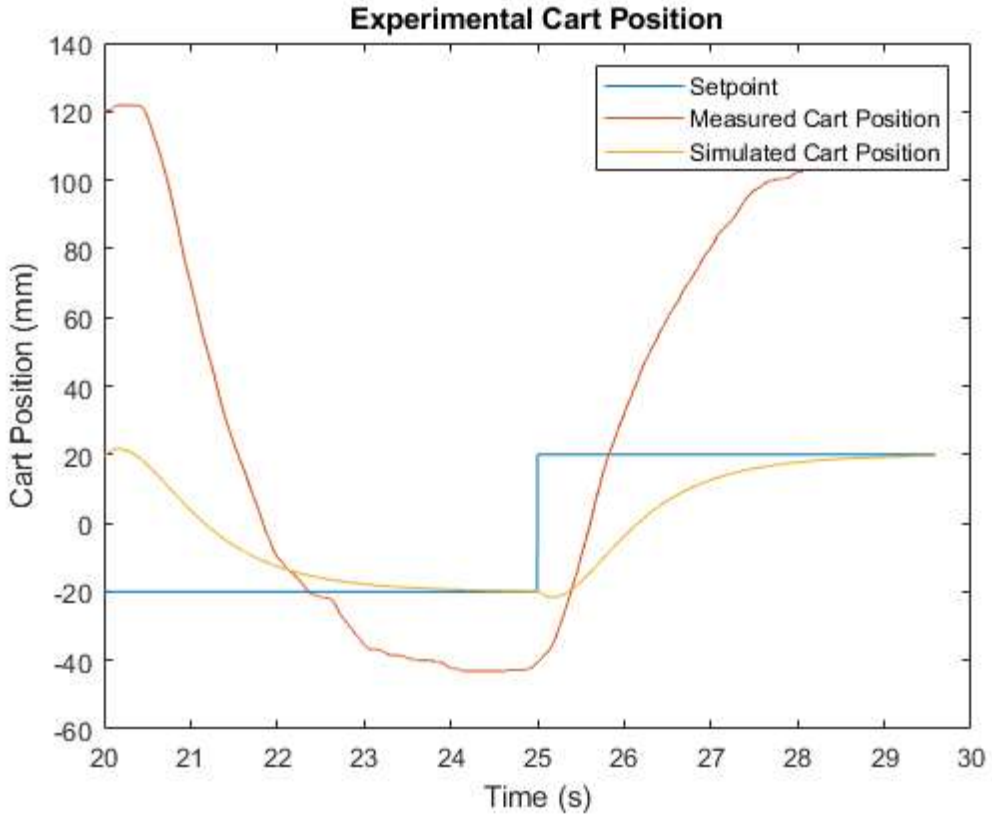

Simulated Pendulum Angle
Alpha (degrees)
Time (s)
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
0
1
2
3
4
5
6
7
8
9
10


Simulated Voltage
Voltage (V)
Time (s)
1.5
1
0.5
0
-0.5
-1
-1.5
0
1
2
3
4
5
6
7
8
9
10


Simulated Cart Position
Setpoint
Cart Position
Cart Position (mm)
Time (s)
40
30
20
10
0
-10
-20
-30
-40
0
1
2
3
4
5
6
7
8
9
10


Experimental Pendulum Angle
Measured Pendulum Angle
Simulated Pendulum Angle
Alpha (degrees)
Time (s)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
20
21
22
23
24
25
26
27
28
29
30





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