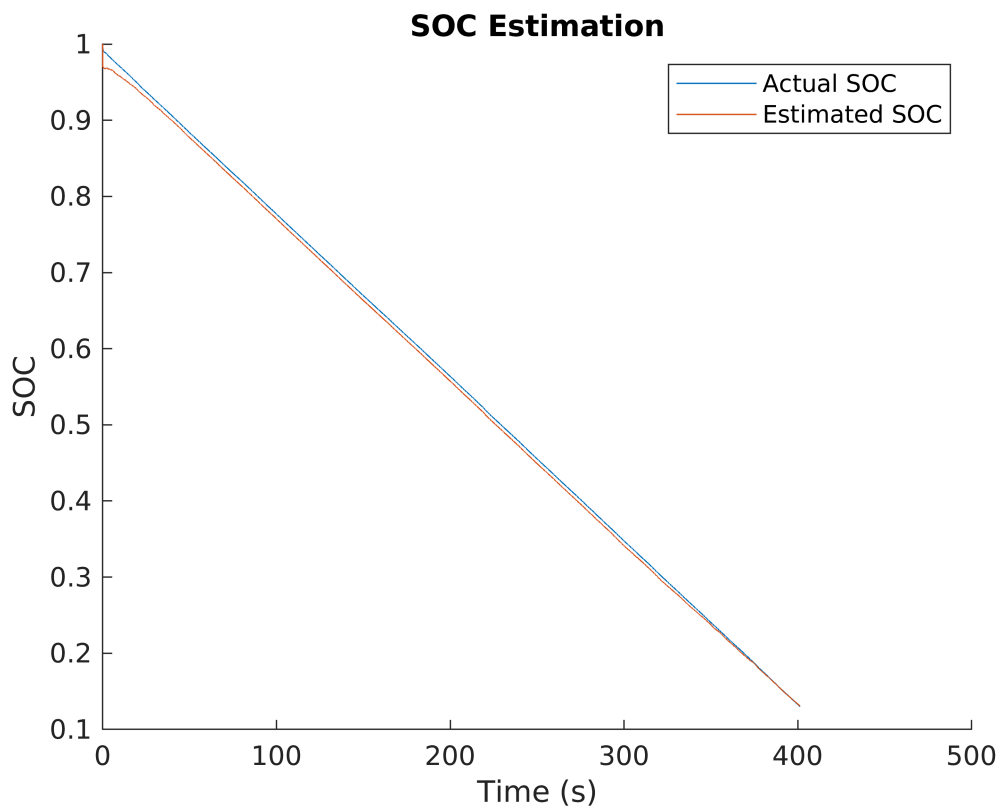


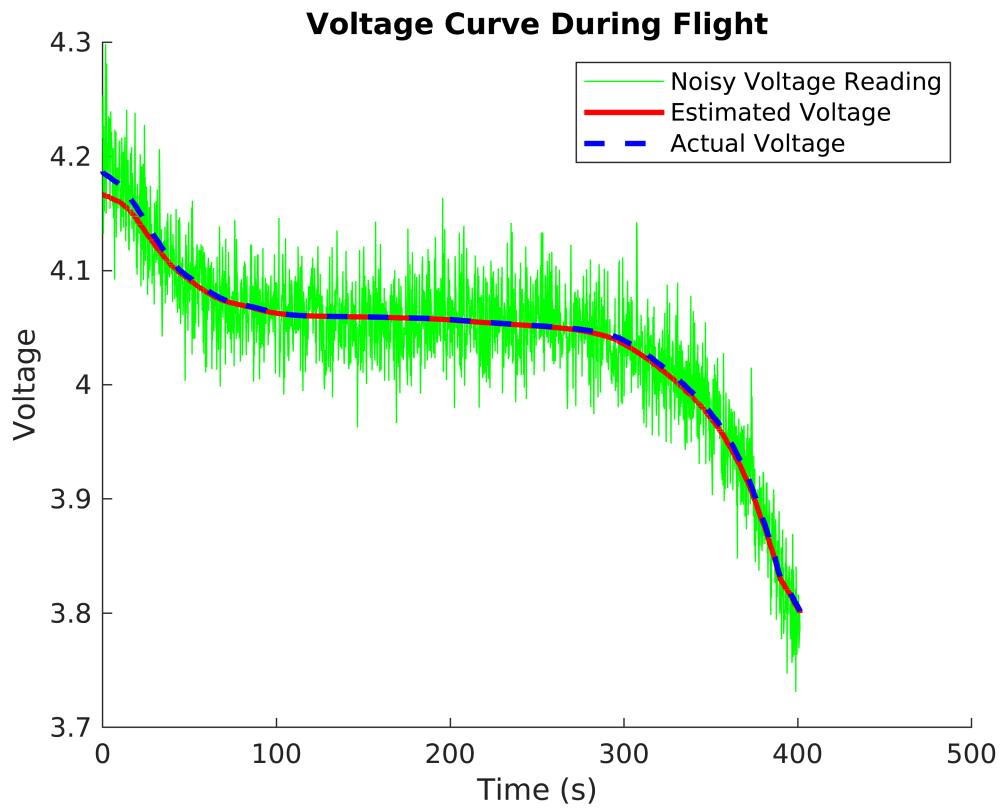
Full Sim Experiments

- variable step, auto, max=10, min=.01, tol=1e-4

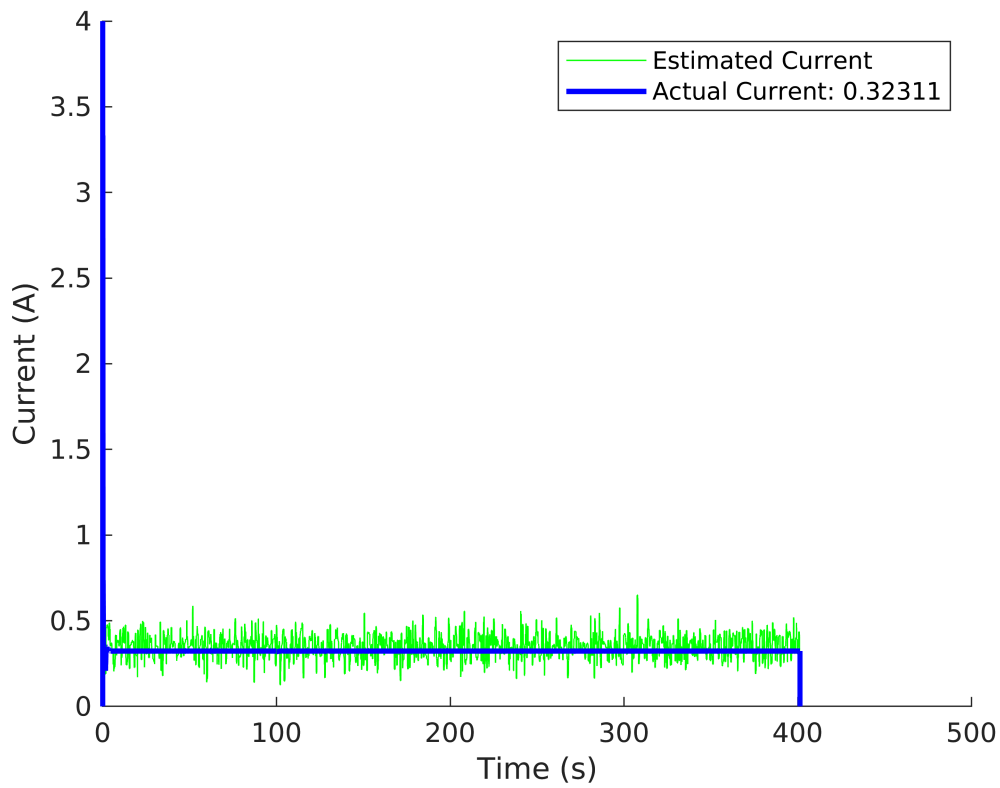
```
f1 = figure(1); clf;  
hold on;  
plot(soc.Time, soc.Data);  
plot(soc_hat.Time, soc_hat.Data);  
title("SOC Estimation");  
legend(["Actual SOC", "Estimated SOC"]);  
ylabel("SOC");  
xlabel("Time (s)");  
hold off;
```



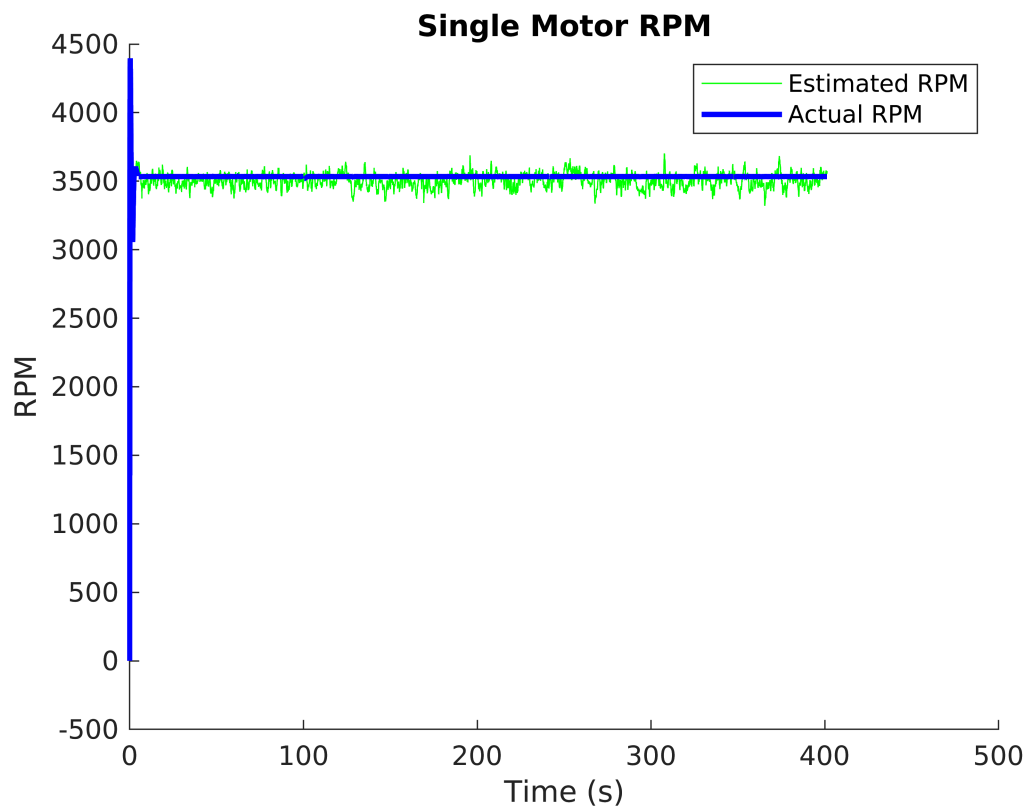
```
f2 = figure(2); clf;  
hold on;  
plot(noisy_v.Time, noisy_v.Data, 'g');  
plot(v_batt_hat.Time, smoothdata(v_batt_hat.Data, 'movmean', 500), 'r', 'linewidth', 2);  
plot(v_batt.Time, smoothdata(v_batt.Data, 'movmean', 500), 'b--', 'linewidth', 2);  
hold off;  
title("Voltage Curve During Flight");  
xlabel("Time (s)");  
ylabel("Voltage");  
legend(["Noisy Voltage Reading", "Estimated Voltage", "Actual Voltage"]);
```



```
i_hatData = i_hat.Data(1,:);
f3 = figure(3); clf;
hold on;
plot(i_hat.Time, i_hatData, 'g');
plot(i_mot.Time, i_mot.Data, 'b', 'linewidth', 2);
hold off;
% title("Single Motor Current Draw");
xlabel("Time (s)");
ylabel("Current (A)");
legend(["Estimated Current", "Actual Current: " + num2str(i_mot.Data(1000))]);
ylim([0 4]);
```

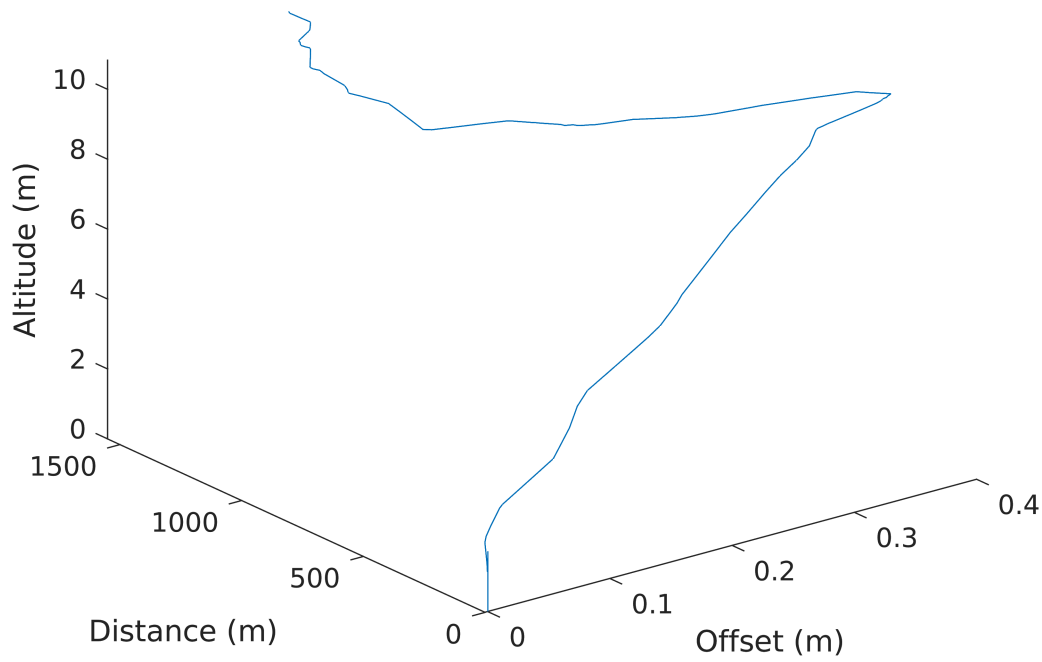


```
f4 = figure(4); clf;
hold on;
plot(rpm_hat.Time, rpm_hat.Data, 'g');
plot(rpm.Time, rpm.Data, 'b', 'linewidth', 2);
hold off;
xlabel("Time (s)");
ylabel("RPM");
title("Single Motor RPM");
legend(["Estimated RPM", "Actual RPM"]);
```

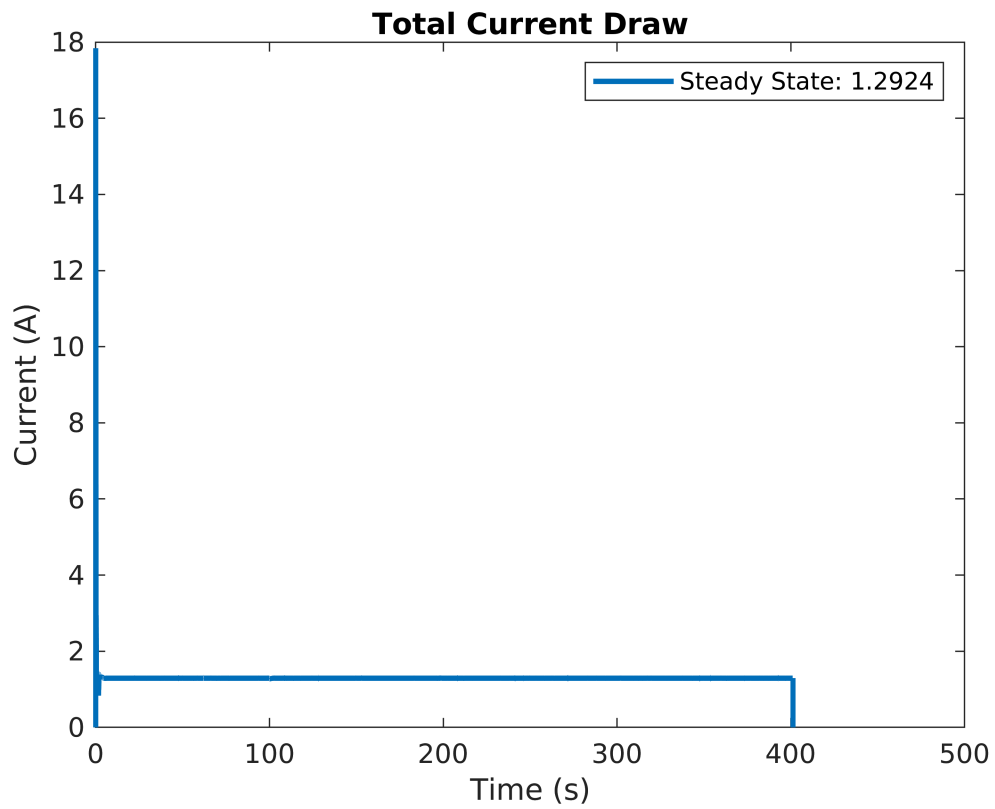


```
f5 = figure(5); clf;
plot3(pos(:,1), pos(:,2), pos(:,3));
%xlim([-1 1]);
xlabel("Offset (m)");
ylabel("Distance (m)");
zlabel("Altitude (m)");
title("UAV Trajectory");
```

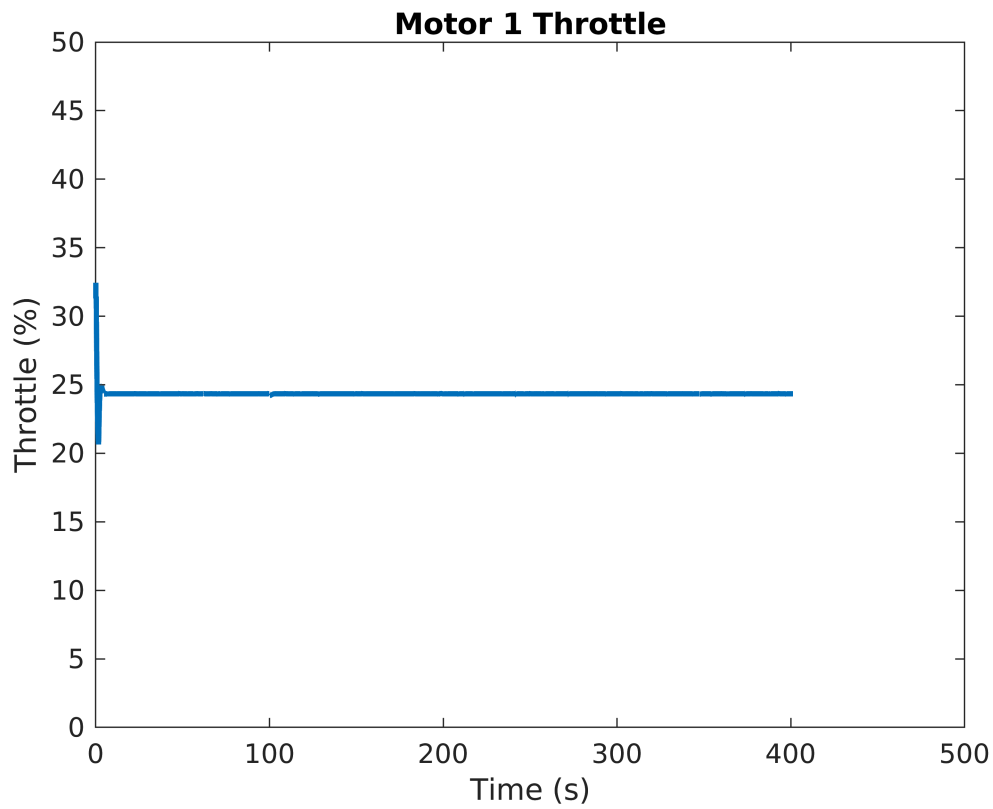
UAV Trajectory



```
f6 = figure(6); clf;
plot(i_batt.Time, i_batt.Data, 'linewidth', 2);
title("Total Current Draw");
xlabel("Time (s)");
ylim([0 18]);
ylabel("Current (A)");
legend(["Steady State: " + num2str(i_batt.Data(1000))]);
```



```
f7 = figure(7); clf;  
plot(m1_throttle.Time, m1_throttle.Data, 'linewidth', 2);  
title("Motor 1 Throttle");  
xlabel("Time (s)");  
ylabel("Throttle (%");  
ylim([0 50]);
```



```
f8 = figure(8); clf;
hold on;
plot(m2_throttle.Time, m2_throttle.Data, 'linewidth', 2);
plot(m3_throttle.Time, m3_throttle.Data, 'linewidth', 2);
plot(m4_throttle.Time, m4_throttle.Data, 'linewidth', 2);
hold off;
title("Motor 2,3,4 Throttle");
xlabel("Time (s)");
ylabel("Throttle (%)");
ylim([0 50]);
legend()
```

