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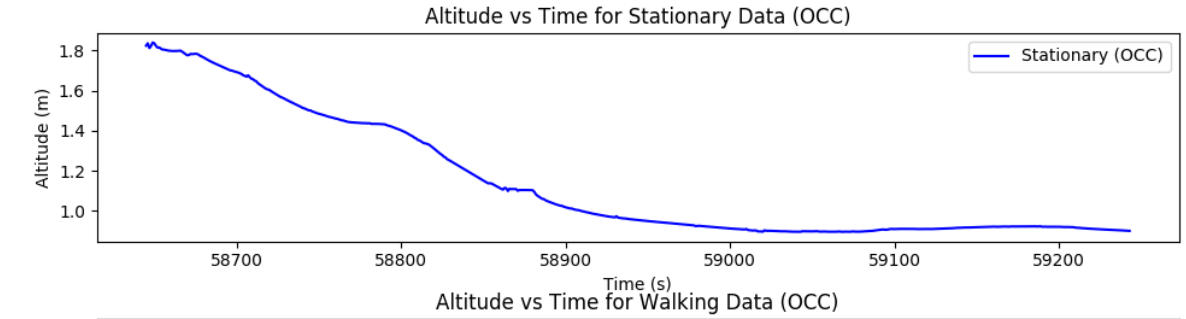
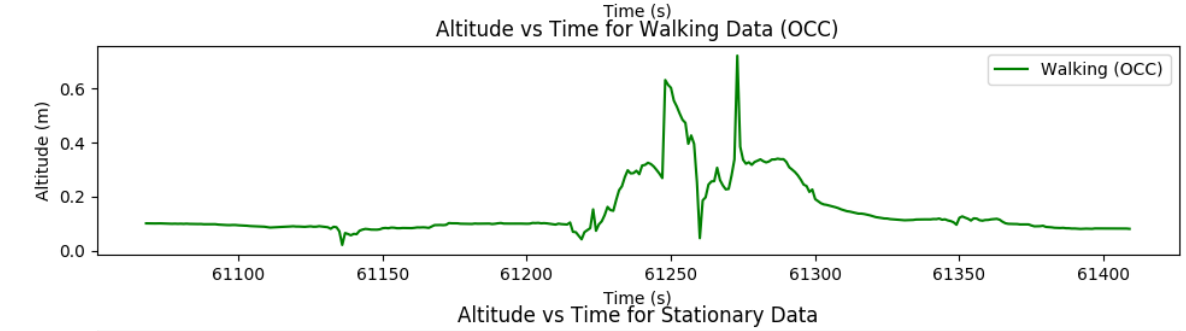
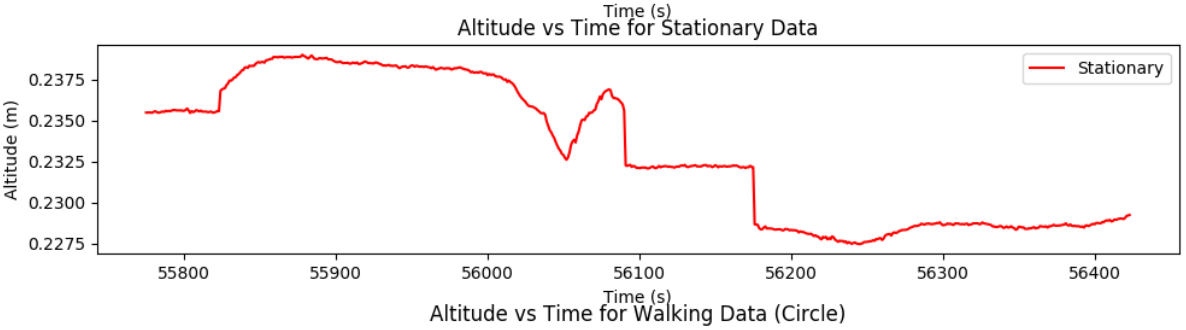
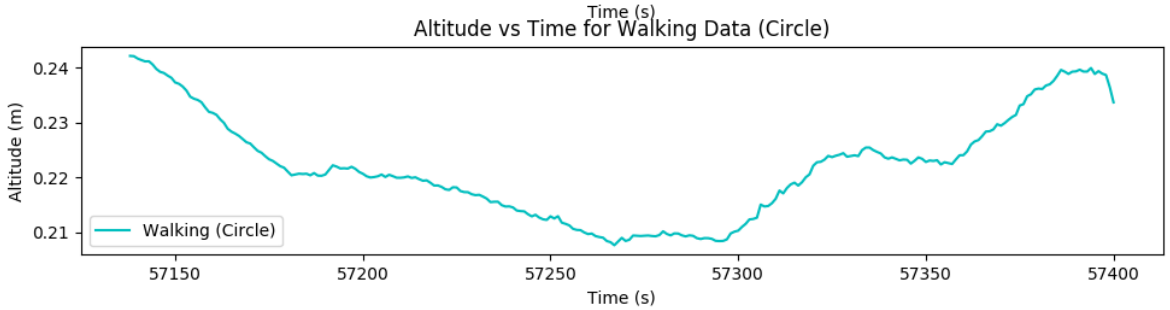
EECE5554
Lab 2 Report
Due Date: 10/16/22

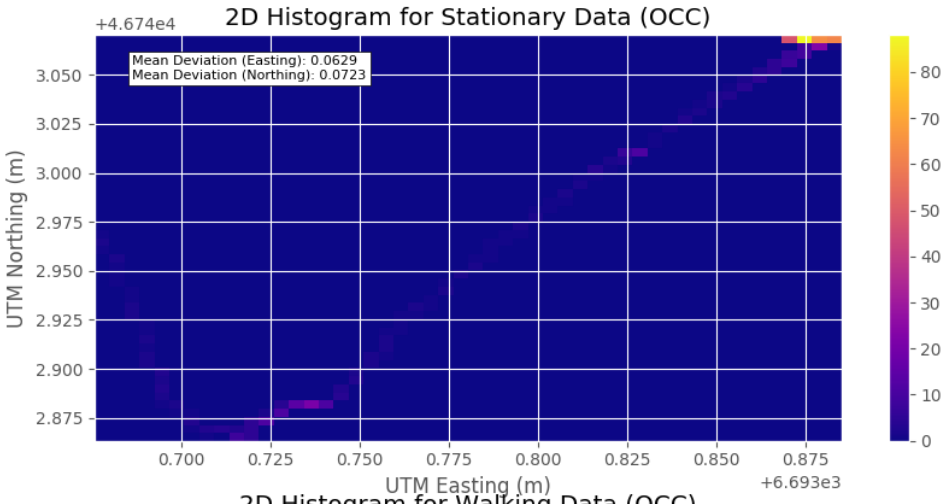
RTK (Real-Time Kinematic) is an advanced satellite navigation method that significantly refines the accuracy of position data from standard GPS systems. By utilizing a stationary base station with a known position and a mobile receiver, RTK corrects positional errors in real-time, elevating accuracy from meters to centimeters. This precision is especially beneficial in industries like agriculture (for precision farming), surveying, and construction. However, its performance can be affected by factors such as distance from the base (typically effective within 10-20 kilometers) and physical obstructions like buildings or trees.

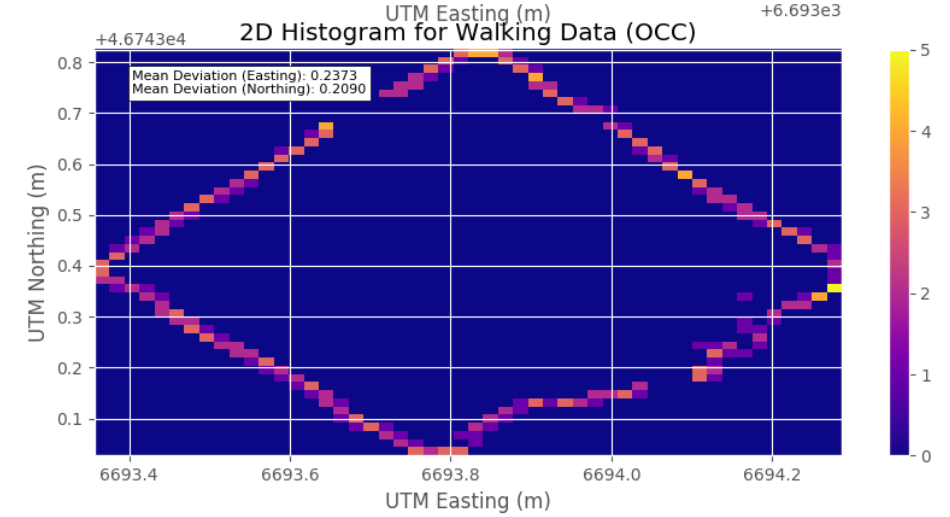

Altitude vs Time for Stationary Data (OCC)
Stationary (OCC)
Altitude (m)
1.8
1.6
1.4
1.2
1.0
58700
58800
58900
59000
59100
59200
Time (s)

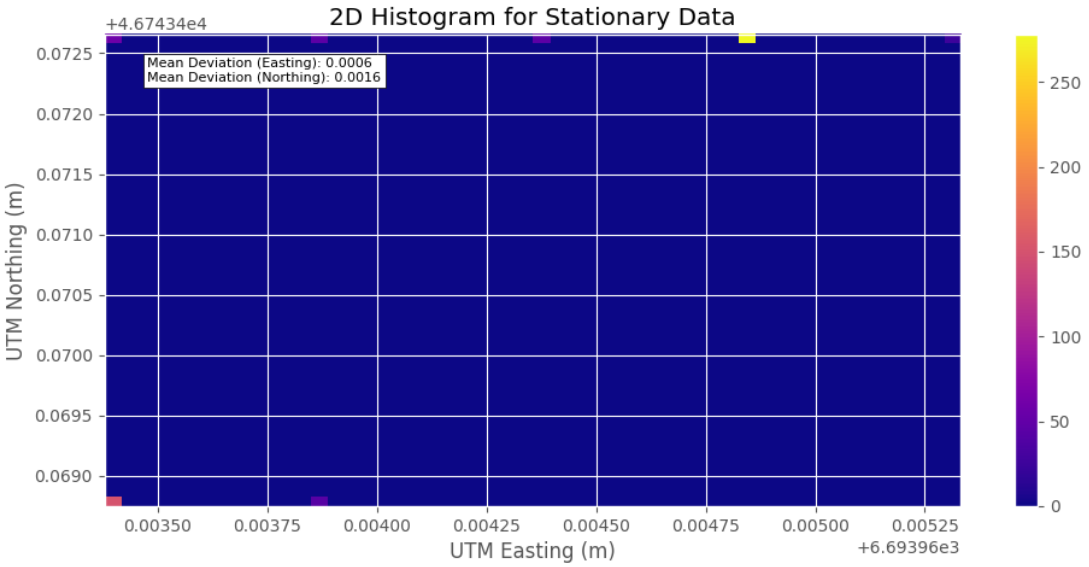

Altitude vs Time for Walking Data (OCC)
Walking (OCC)
Altitude (m)
0.6
0.4
0.2
0.0
61100
61150
61200
61250
61300
61350
61400
Time (s)

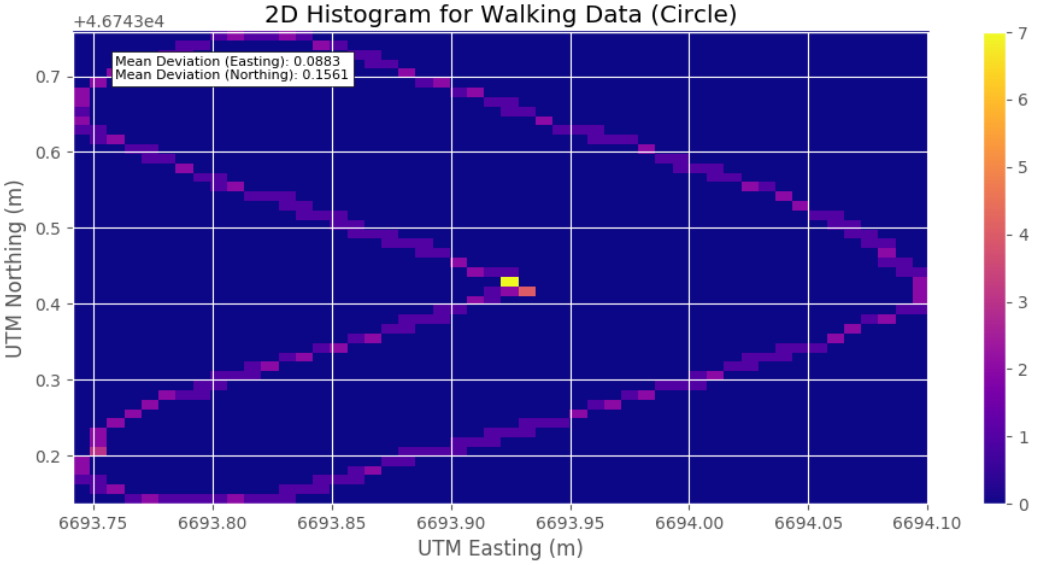

Altitude vs Time for Stationary Data
Stationary
Altitude (m)
0.2375
0.2350
0.2325
0.2300
0.2275
55800
55900
56000
56100
56200
56300
56400
Time (s)

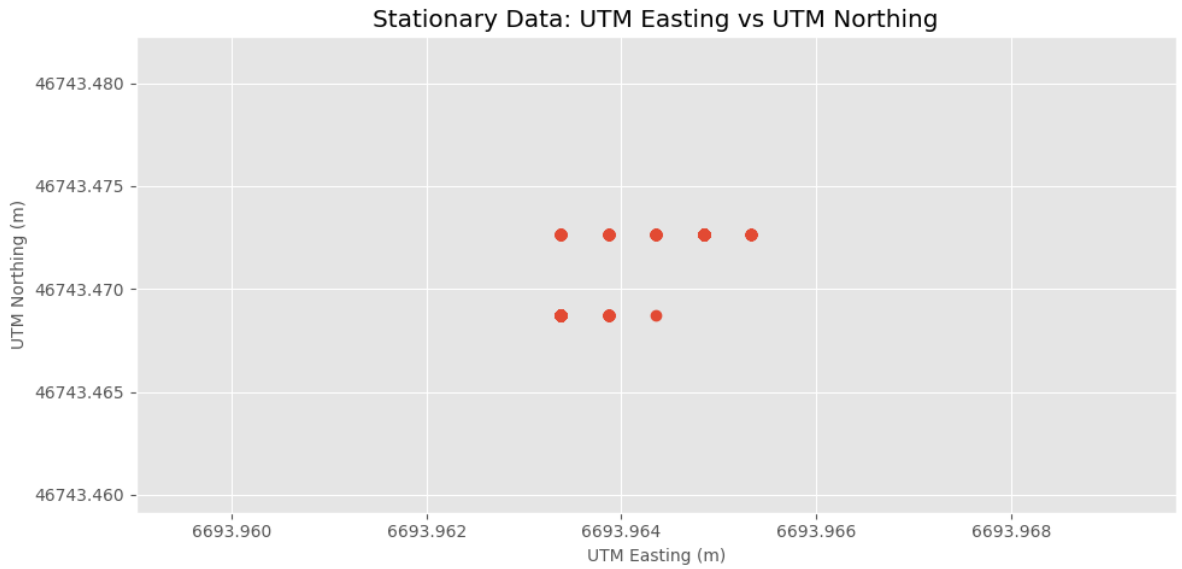

Altitude vs Time for Walking Data (Circle)
Walking (Circle)
Altitude (m)
0.24
0.23
0.22
0.21
57150
57200
57250
57300
57350
57400
Time (s)

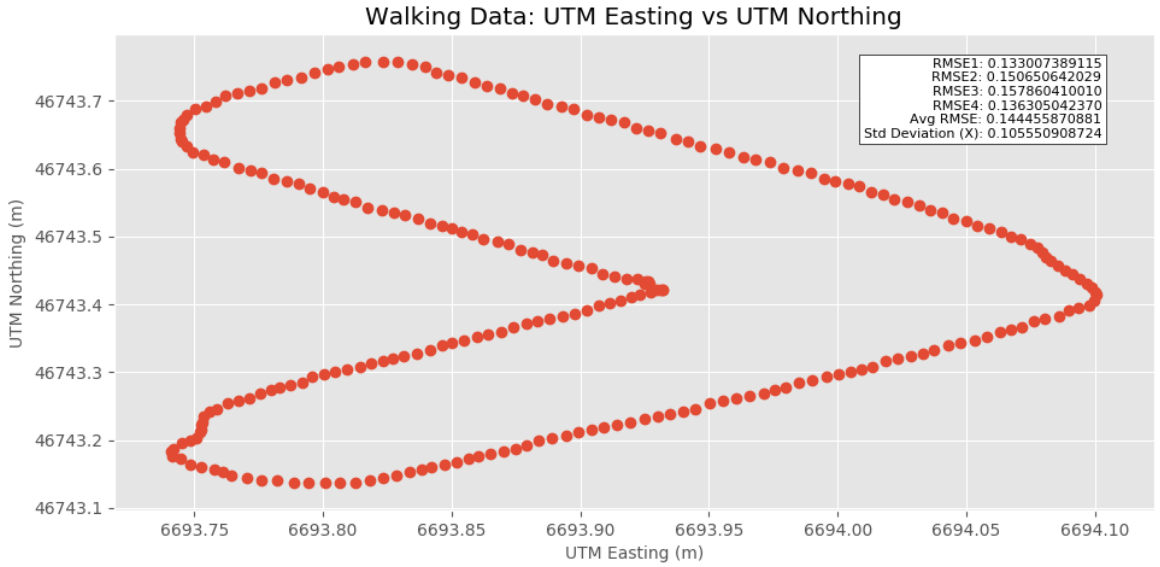

2D Histogram for Stationary Data (OCC)
+4.674e4
Mean Deviation (Easting): 0.0629
Mean Deviation (Northing): 0.0723
3.050
3.025
3.000
2.975
2.950
2.925
2.900
2.875
UTM Northing (m)
0.700
0.725
0.750
0.775
0.800
0.825
0.850
0.875
+6.693e3
UTM Easting (m)
80
70
60
50
40
30
20
10
0


2D Histogram for Walking Data (OCC)
+4.6743e4
Mean Deviation (Easting): 0.2373
Mean Deviation (Northing): 0.2090
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
UTM Northing (m)
6693.4
6693.6
6693.8
6694.0
6694.2
UTM Easting (m)
5
4
3
2
1
0


2D Histogram for Stationary Data
+4.67434e4
Mean Deviation (Easting): 0.0006
Mean Deviation (Northing): 0.0016
UTM Northing (m)
0.0725
0.0720
0.0715
0.0710
0.0705
0.0700
0.0695
0.0690
0.00350
0.00375
0.00400
0.00425
0.00450
0.00475
0.00500
0.00525
UTM Easting (m)
+6.69396e3
250
200
150
100
50
0


2D Histogram for Walking Data (Circle)
+4.6743e4
Mean Deviation (Easting): 0.0883
Mean Deviation (Northing): 0.1561
UTM Northing (m)
0.7
0.6
0.5
0.4
0.3
0.2
6693.75
6693.80
6693.85
6693.90
6693.95
6694.00
6694.05
6694.10
UTM Easting (m)
7
6
5
4
3
2
1
0


Stationary Data: UTM Easting vs UTM Northing
46743.480
46743.475
46743.470
46743.465
46743.460
UTM Northing (m)
6693.960
6693.962
6693.964
6693.966
6693.968
UTM Easting (m)


Walking Data: UTM Easting vs UTM Northing
RMSE1: 0.133007389115
RMSE2: 0.150650642029
RMSE3: 0.157860410010
RMSE4: 0.136305042370
Avg RMSE: 0.144455870881
Std Deviation (X): 0.105550908724
46743.7
46743.6
46743.5
46743.4
46743.3
46743.2
46743.1
UTM Northing (m)
6693.75
6693.80
6693.85
6693.90
6693.95
6694.00
6694.05
6694.10
UTM Easting (m)