GISC 422 LAB1-GPS (GLOBAL POSITIONING SYSTEM) INTRO

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Introduction:

This lab is about testing the horizontal and vertical precision of Consumer-graded GPS navigation system.

Global Positioning system is used across the globe to identify and position the particular points/tracks/areas on earth using Global Navigation System Satellites(GNSS). In this particular lab we used mobile based GPS apps to trace/mark our location/points on earth.

Method:

First we downloaded the "MyTrack App" from google playstore. Using this particular app, we started tracking the path from Emergency call center near the Rutherford building until we reached the supposed survey points near the University bookstore marked in LINZ geodetic database as DK9R(6) and A56K(5). After reaching these points, I marked their positions in the app and noted down their respective altitudes. At DK9R, I measured the GPS altitude as 26m(refer to fig. **DK9R GPS-Marked Altitude below)** and at A56K as 22m(refer to fig. **A56K GPS-Marked Altitude below)**. After noting down these details, I traced my way back back to same emergency exit near Rutherford building where I started the tracking. Now I exported this .gpx file to lab computer using outlook. Then I opened Google Earth pro, uploaded this file and using the "show ruler" option in top toolbar measured the horizontal difference between LINZ DK9R point and it's GPS marked point. Followed the same procedure for LINZ A56K and its respective GPS-mark. Then I obtained the exact measurements of LINZ DK9R and A56K by clicking on more information on their two pinned marks in Google Earth Pro.

Results:

There is difference in horizontal and vertical distance between the geodetic data base points and their measurements marked using Mobile based GPS.

Concluding Observation:

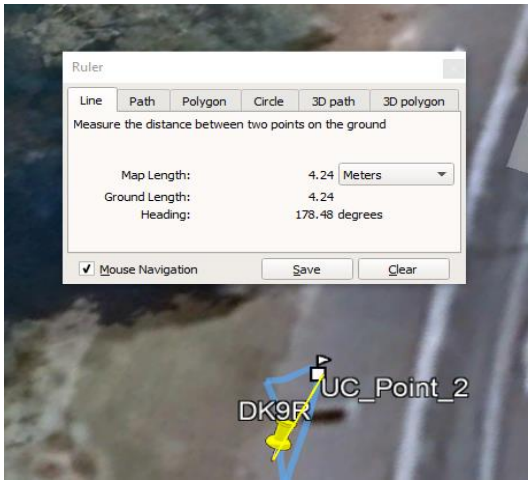
Consumer grade GPS apps show variation in calculating the exact position on earth. Accuracy and Precision of GPS receivers on Earth gets influenced by number of satellites currently in visibility near our measuring point, surrounding landscape and the quality of GPS device used.

As a general observation , the vertical accuracy of GNSS/GPS receivers is typically 1.7 times the horizontal accuracy(1).

1) https://junipersys.com/support/article/6614#:~:text=Just%20as%20a%20general%20observation,to%202%20m%20vertical%20accuracy.

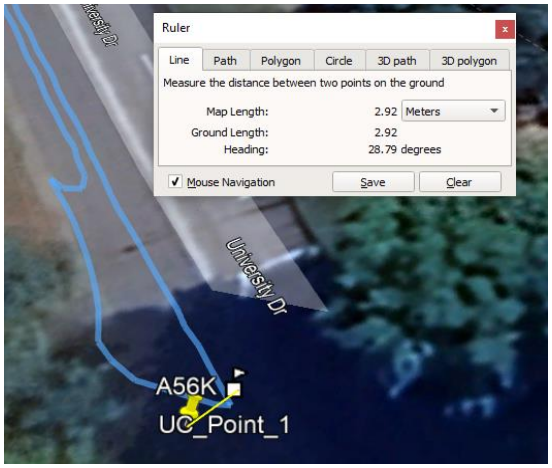
Graphics:

DK9R GPS-Marked Altitude

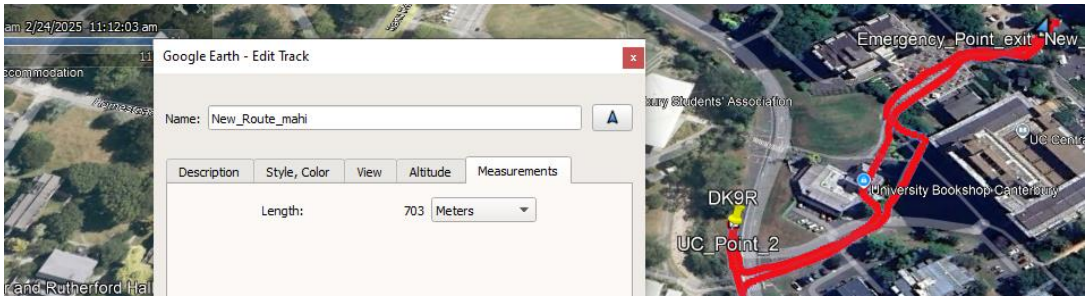


Difference between DK9R LINZ mark and it's supposed GPS marked point

A56K GPS-Marked Altitude



Difference between A56K LINZ Mark and its supposed GPS Marked point



Total GPS track length

Mark Code	LINZ mark to GPS mark horizontal distance(m) and heading(deg)	GPS mark altitude/height(m)	LINZ mark ellipsoidal height(m)	LINZ mark to GPS mark vertical distance(m)
A56K	2.92 m and 28.79 deg	26m	25.624	0.376
DK9R	4.24 m and 178.48 deg	22m	25.238	-3.238
GPS Track length : 703m				
GPS device and App used: MYTRACK				