LAB-1 REPORT

GPS SENSOR DRIVER FOR BU353SN SENSOR

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1.Walking Data

Data Collection:

The data was collected while walking in a straight line for about 100m in the road adjacent to the rail tracks(Behind Snell Library) leading to Ruggles T station. The sky was a bit overcast with few droplets of rain(RF signal disturbance due to environmental factors).

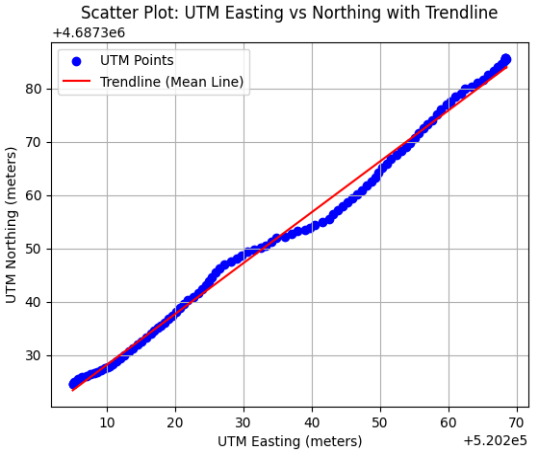

Figure 1.UTM Data for 100 M Walking

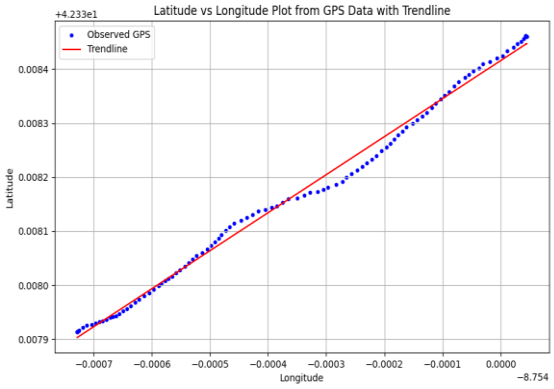

Figure 2. Latitude v Longitude

Observations:

The following points can be inferred from the plot *Figure 1*-UTM Northing v UTM Easting:

- The plot depicts the UTM points of easting plotted against northing and forming a almost straight line.
- The trend-line is plotted as the mean of UTM points plotted in the graph.
- There can be observed a slight stray (20-30 m of UTM Easting) in the data towards the upper side of the trend-line which may be due to the gush of wind which breezed through during the data capturing.
- Another more significant stray is observed in (40 – 50 m of UTM Easting) which was caused to the deviation from the straight line walking path due to a car coming down the street. Similar deviations are observed from *Figure 2* when latitude is plotted against the longitude.

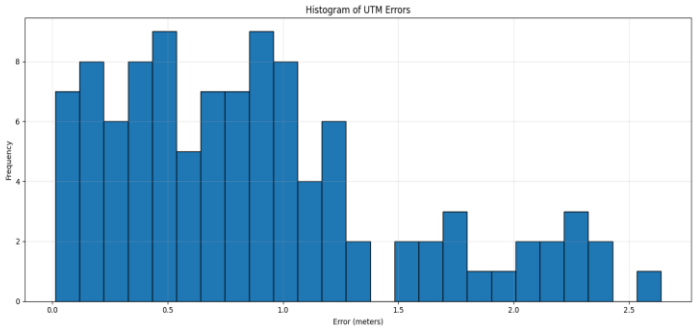

Figure 3.UTM Errors

- The errors of UTM points observed in *Figure 3* have been plotted as a histogram by calculating the differences between absolute value and measured values.

2. Stationary Data

Data Collection:
In the second case, the data collection was performed in open sky area with no disturbances of tree cover opposite to the Snell Library. The climatic condition were a bit overcast with winds blowing a bit strongly causing a possible disturbance to the RF value readings by the sensor.
The GPS Sensor puck was left undisturbed for 10 minutes and allowed to collect the data. Since the area opposite to Snell library are surrounded by buildings that may disturb the data collection by reflecting the signal multiple times before the sensor picks it up causing errors in the collected values.

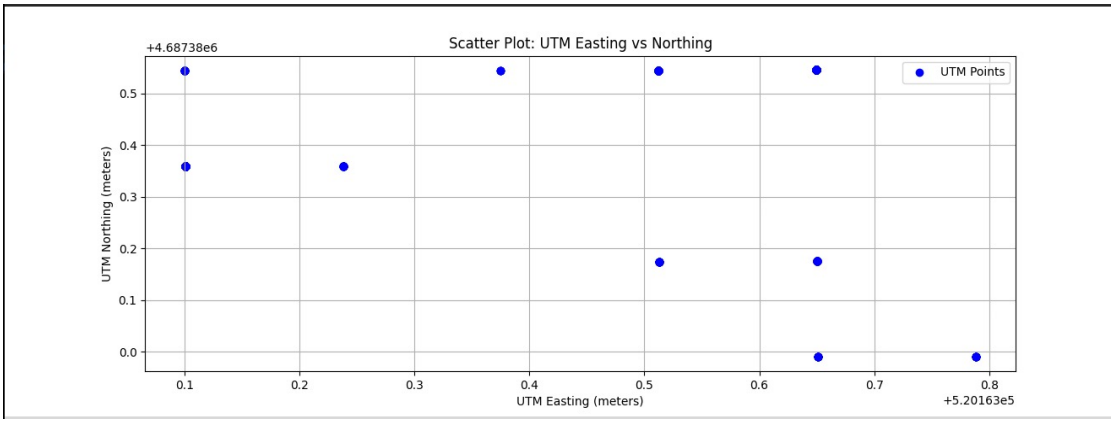

Figure.4 Stationary Data

Observations:

- From *Figure 4* , it can be clearly observed that the stationary data collected doesn't provide a clarity on the puck's position in the space. This may be due to reasons such as the presence of buildings as mentioned above.
- Also, another significant reason for the disarray of stationary data values is due to the Dilution of Precision (DoP) phenomenon that occurs due to inertia presence of the GPS puck thereby many number of satellites trying to connect to it in the same time.

Inference:
The major inference that can drawn from both of the activities are such that :

a) GPS sensor's accuracy in measuring the location coordinates during walking activity is much better than the one measured when it is stationary.
b) Presence of buildings and other environmental conditions also the data to a particular scale.
c) Dilution of Precision is more prevalent in stationary data than in walking data.