Lab1 GPS

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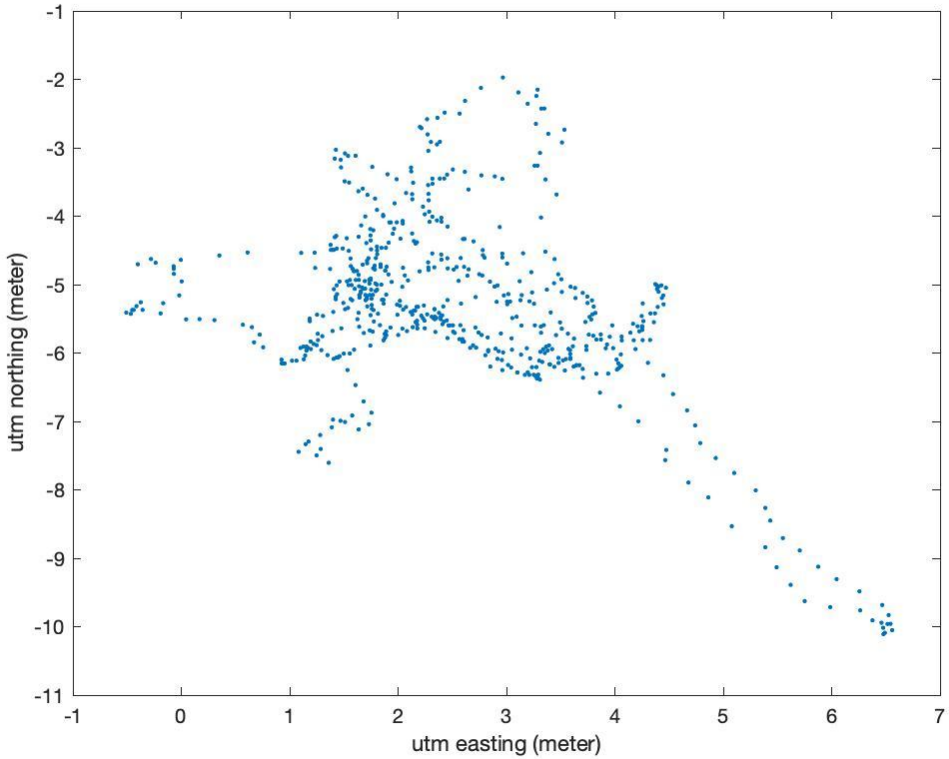
Driver.py - loading from log

```
lc = lcm.LCM()
msg = lab1_t()

while True:
    #time.sleep(1)
    new_line=gpsdata.readline()
    data_string=np.array(new_line.split(','))

    #THE REQUIRED PARSER IS GPGGA

    if  data_string[0]=='$GPGGA' :
        data_string[data_string=='']='0'
        print data_string
        msg.timestamp= float(data_string[1])
        msg.latitude= float(data_string[2])
        msg.lat_dir=data_string[3]
        msg.longitude=float(data_string[4])
        msg.long_dir=data_string[5]
        msg.altitude=float(data_string[9])
        lat=(int((float(data_string[2])/100))+((float(data_string[2])%100)/60))
        lon=(int((float(data_string[4])/100))+((float(data_string[4])%100)/60))
        utmconvert  =utm.from_latlon(lat, lon)
        msg.utmeasting=float(utmconvert[0])
        msg.utmnorthing=float(utmconvert[1])
        lc.publish("GPS", msg.encode())
```

Structure

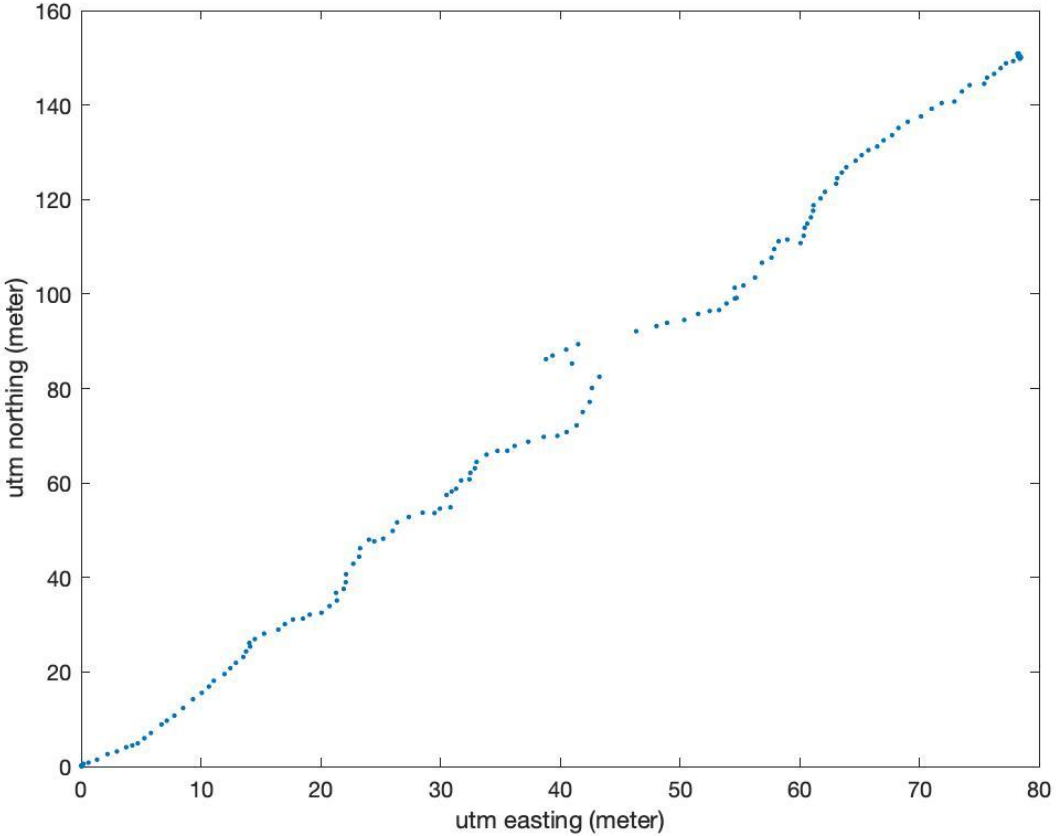
```
package gps;

struct lab1_t
{

        double   timestamp;
        double   latitude;
        string   lat_direction;
        double   longitude;
        string   long_direction;
        double   altitude;
        double   utmeasting;
        double   utmnorthing;

}
```

One point gathering beside CSC



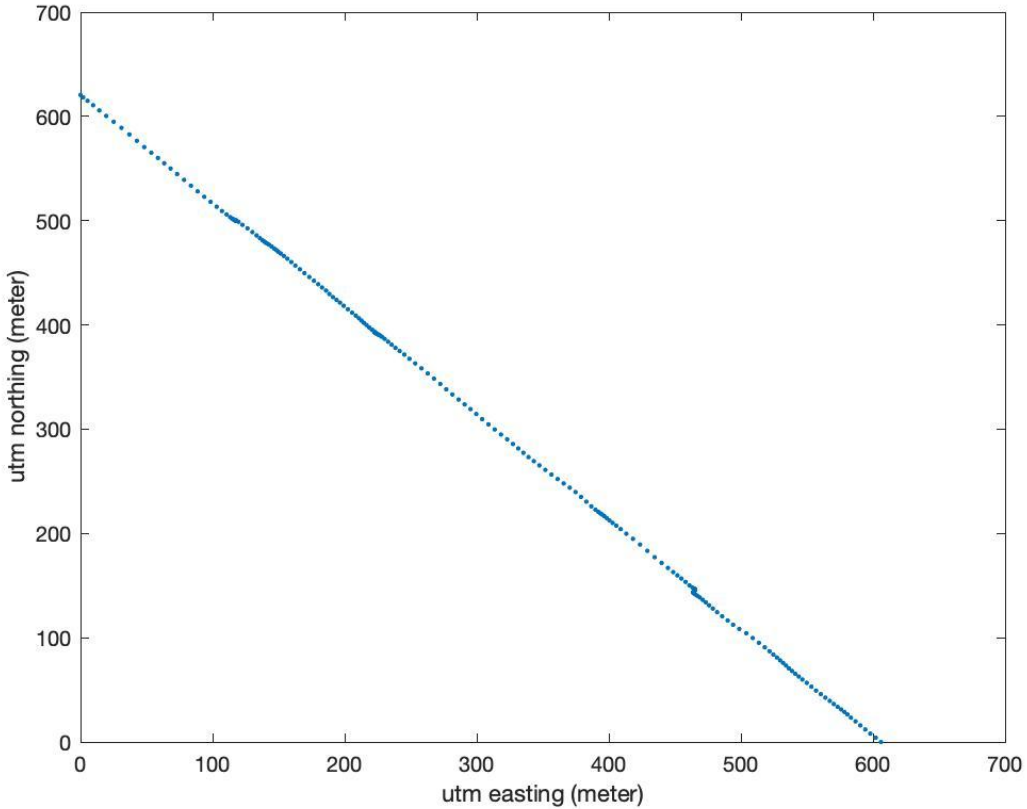
- The plots shows the error of easting is around 8m, northing 12m
-
- Actual
- UTM_easting: 328045.9
- UTM_northing:4689494.4
-
- Measured
- UTM_westing: 671654.4
- UTM_northing: 4689515.8

Walking 200m from library to huntington Ave



Moving northeast

Moving 1000m from Columbus to Mass Ave



Moving southeast

Analysis conclusion

The manual of the model BU-353 is around 2D-10m RMS.

The result of lab 1 showed that the status point error is around 8m-12m, this data are near what we expect of the manual of the model.

In the mid when walking from library to Huntington Ave, we observe that the number of satellite changed. Thus may begets to the error. Also, building may affect the gathering data from the satellites. These might cause to error.

Moving in faster speed seems the error occurs fewer, but in our experience the number of satellite is around 9~10, so it may be more accurate.(Not sure)