
LAB I

EECE 554 ROBOTICS SENSING AND NAVIGATION
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ANDAC DEMIR
001826062

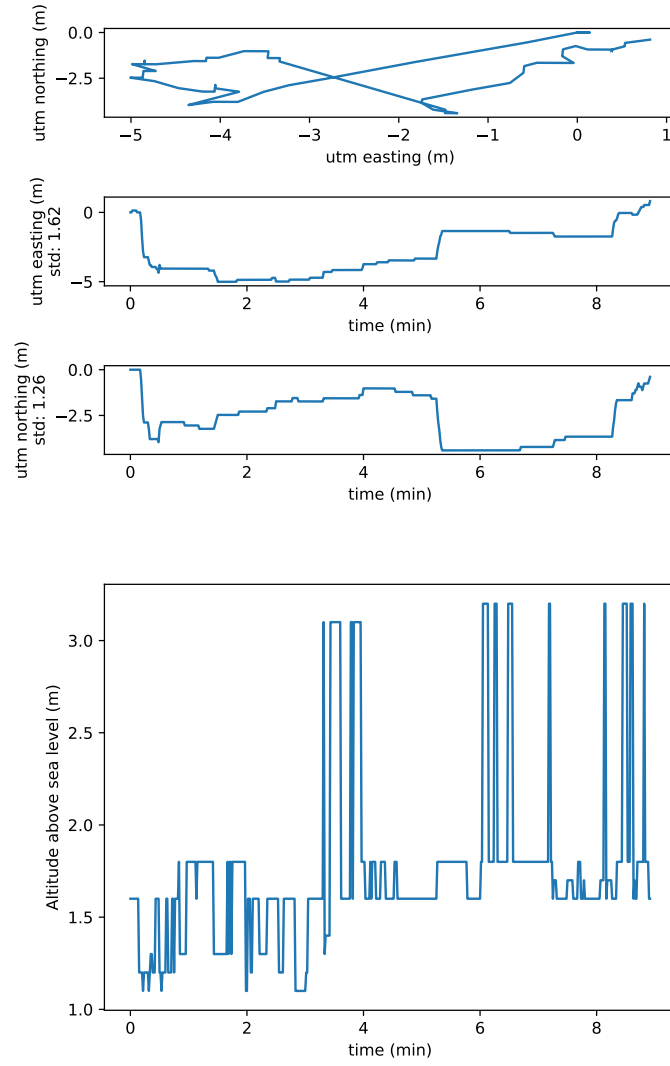


Figure 1: UTM northing, easting and altitude measurements during stationary data collection. UTM easting measurements have a standard deviation of 1.62 m, similarly it is 1.26 m for UTM northing.

The GPS accuracy depends on a lot of factors including but not limited to buildings, big trees, weather conditions, and the satellites configuration. In our experiments, we observed that GPS works better in a non-stationary setting and tracking performance gets better the faster we move. Noise is additive Gaussian noise with zero mean. We presume a good error estimate of the gnss puck is ± 1.5 m.

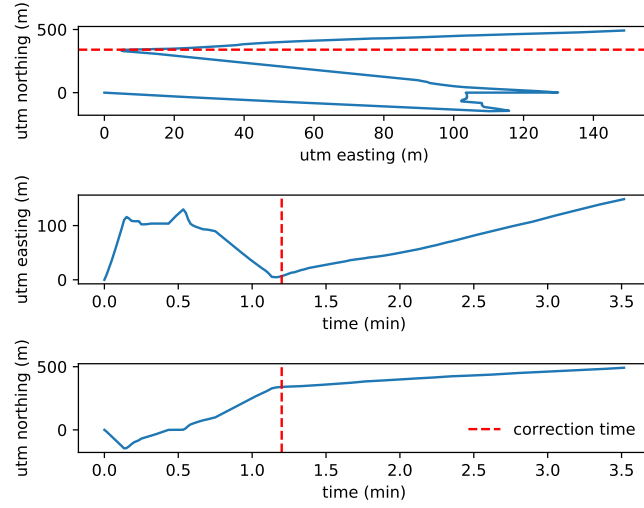


Figure 2: UTM northing and easting measurements. Before the red dotted line is the measurements from first 1.2 mins. We assume it takes about a minute for the correction of Kalman filter deployed inside the gnss puck. We look at the noise distribution after Kalman correction.

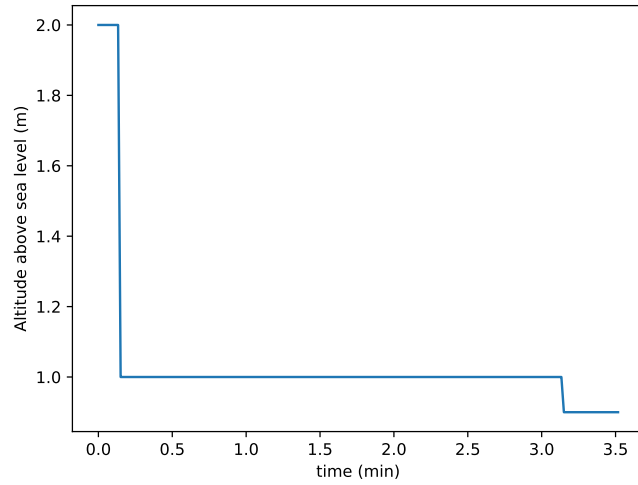


Figure 3: Altitude measurements during walking experiment.

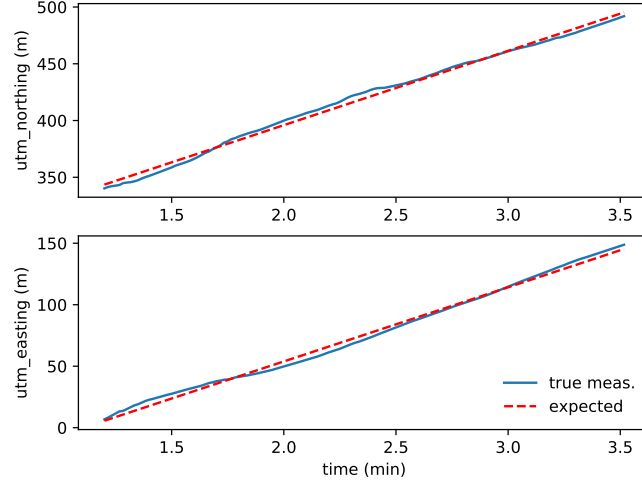


Figure 4: Sensor measurements are represented with a blue line and red dotted line is the expected results derived by linear regression.

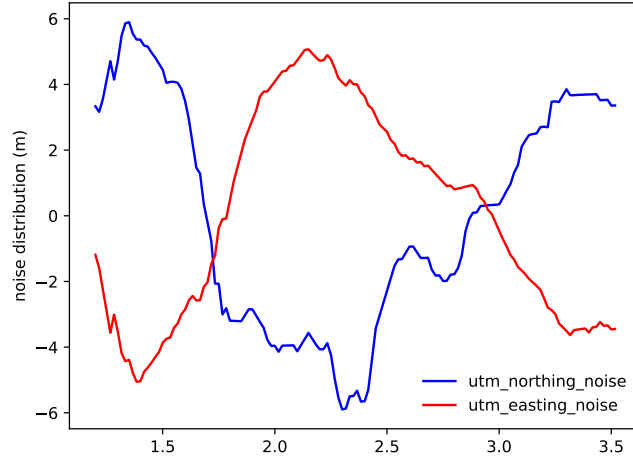


Figure 5: Noise distribution of UTM northing and easting measurements while walking outside. UTM easting measurements have an additive Gaussian noise distribution with 0 mean and standard deviation 3.10 m. Similarly, UTM northing measurements have an additive Gaussian noise with 0 mean and standard deviation 3.43 m.