Kalman Filter Application

Alssandro Riccardi

January 15, 2021

Abstract

This is a simple exercise where you will have to complete the Kalman Filter algorithm.

1 The Exercise

What you have to do is simple, implement the *Propagation* and *Correction* step of the Kalman Filter. I provide you with a framework where the 80% of the work is already done, but still not complete. Find the correct functions that needs to be completed and complete them. Just remember, the required matrices are already implemented.

1.1 The Software

The *kalman_filter_applied* is the name of the software. Its function is to simulate a trajectory and generate GPS measurements that will be recorded. With these recordings you can then estimate the truth trajectory by using the KF (that you have to complete).

1.1.1 The Kalman Filter

The Kalman Filter is an algorithm that uses a series of measurements observed over time, containing statistical noise and other inaccuracies, and produces estimates of unknown variables that tend to be more accurate than those based on a single measurement alone, by estimating a joint probability distribution over the variables for each timeframe. The filter is named after Rudolf E. Kálmán, one of the primary developers of its theory.

Some useful resources:

- `https://en.wikipedia.org/wiki/Kalman_filter`
- `https://www.kalmanfilter.net/default.aspx`