

Kalman 101

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Abstract

Kalman Filtering is a widely used algorithm that has been around for more than 30 years. The terminology “Kalman Filter” is often used. You see it in training books, product description, and user manuals. But what is really behind a Kalman Filter? Why is it used in Dynamic Positioning systems? And how is it implemented?

The paper discusses a brief history of the Kalman Filter. The concept of predictor-corrector type of estimator is then introduced using a simple example. A broad overview of the discrete Kalman Filter algorithm is presented following the step-by-step operations. The complete picture of the operation of the Kalman Filter is discussed so that the reader can start to understand how such an estimator can be used for Dynamic Positioning.

The next section of the paper tries to answer this question “Where does the Kalman Filter fit in the overall DP algorithm?” and introduces a DP System typical block diagram.

The third and final section of this paper take an example taken from simulation to illustrate all the concepts introduced above and to illustrate how it all works in real life?

The conclusion touches on the advantages and disadvantages of Kalman Filter, and introduces other types of estimators.

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