

Fundamentals Of Kalman Filtering



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Product Description

This text is a practical guide to building Kalman filters and shows how the filtering equations can be applied to real-life problems. Numerous examples are presented in detail, showing the many ways in which Kalman filters can be designed. Computer code written in FORTRAN, MATLAB[registered], and True BASIC accompanies all of the examples so that the interested reader can verify concepts and explore issues beyond the scope of the text. Sometimes mistakes are introduced intentionally to the initial filter designs to show the reader what happens when the filter is not working properly. The text spends a great deal of time setting up a problem before the Kalman filter is actually formulated to give the reader an intuitive feel for the problem being addressed. Real problems are seldom presented in the form of differential equations and they usually do not have unique solutions. Therefore, the authors illustrate several different filtering approaches for tackling a problem. Readers will gain experience in software and performance tradeoffs for determining the best filtering approach for the application at hand. The second edition has two new chapters and an additional appendix. In the first new chapter, a recursive digital filter known as the fading memory filter is introduced and it is shown that for some radar tracking applications the fading

memory filter can yield similar performance to a Kalman filter at far less computational cost. A second new chapter presents techniques for improving Kalman filter performance. Included is a practical method for preprocessing measurement data when there are too many measurements for the filter to utilize in a given amount of time. The chapter also contains practical methods for making the Kalman filter adaptive. A new appendix has been added which serves as a central location and summary for the text's most important concepts and formulas. MATLAB is a registered trademark of The MathWorks, Inc.

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目录:

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