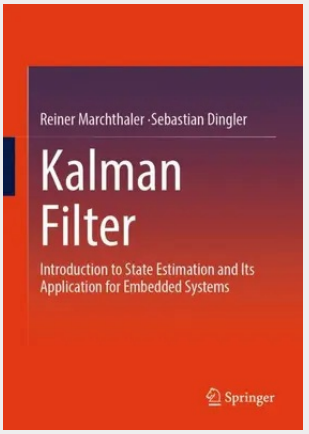
Marchthaler / Dingler

Kalman Filter

Introduction to State Estimation and Its Application for Embedded Systems



This textbook presents the theory of Kalman filtering in an easy-to-understand way. The authors provide an introduction to Kalman filters and their application in embedded systems. In addition, the design of Kalman filters is demonstrated using concrete practical examples – individual steps are explained in detail throughout the book.
Kalman filters are the method of choice for eliminating interference signals from sensor data. This is particularly important because many technical systems obtain their process-relevant information via sensors. However, every sensor measurement contains errors due to various factors. If a system were to operate solely based on these inaccurate sensor readings, many applications—such as navigation systems or autonomous systems—would not be feasible.
The book is suitable for interested bachelor's and master's students in the fields of computer science, mechanical engineering, electrical engineering, and mechatronics. It is also a valuable resource for engineers and researchers who want to use a Kalman filter, for example, for data fusion or the estimation of unknown variables in real-time applications.

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