Φίλτρα Kalman

Νικόλαος Ασημάκης

Abstract

Kalman filters have been used and are used successfully in a wide range of applications, such as aeronautics, telecommunication systems design, energy systems and image processing. The book deals with Kalman filters and includes the necessary material for understanding and programming Kalman filters. It is addressed to undergraduate and graduate students and is a useful tool for the study of problems related to Kalman filters. It can also be used by researchers, lifelong learners and working graduates who update and apply their knowledge. The structure of the book is the following: Optimal Control Theory, Linear Kalman Filter, Riccati and Lyapunov equations solution algorithms, Information Kalman Filter, special Riccati equation, Kalman filter gain elimination, calculation burden of Kalman filters, calculation burden of Riccati and Lyapunov equations solution algorithms, examples of Kalman filters application, parallel implementation of Kalman filter, linear model extension and Extended Kalman Filter. Each chapter includes theory, exercises, summary, bibliography and Evaluation tests. In the book special emphasis is given to Kalman filters programming using software that has been established in the scientific community: Matlab commercial software and Octave free open source software. Due to the fact that this is an e-book, special emphasis is given to the multimedia elements that include the recorded summaries at the end of each chapter and the interactivity elements that include the evaluation tests in each chapter. Finally, special interactive software has been designed for three applications: Kalman filter, the faster Kalman filter and the optimal distributed Kalman filter.