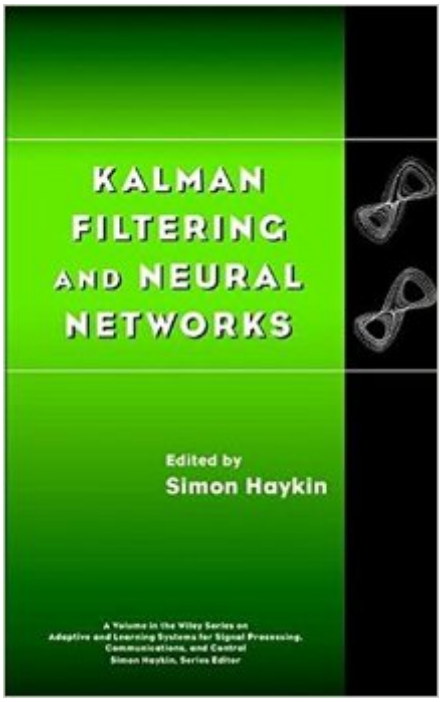
Kalman Filtering And Neural Networks



Synopsis

State-of-the-art coverage of Kalman filter methods for the design of neural networks This self-contained book consists of seven chapters by expert contributors that discuss Kalman filtering as applied to the training and use of neural networks. Although the traditional approach to the subject is almost always linear, this book recognizes and deals with the fact that real problems are most often nonlinear. The first chapter offers an introductory treatment of Kalman filters with an emphasis on basic Kalman filter theory, Rauch-Tung-Striebel smoother, and the extended Kalman filter. Other chapters cover: An algorithm for the training of feedforward and recurrent multilayered perceptrons, based on the decoupled extended Kalman filter (DEKF) Applications of the DEKF learning algorithm to the study of image sequences and the dynamic reconstruction of chaotic processes The dual estimation problem Stochastic nonlinear dynamics: the expectation-maximization (EM) algorithm and the extended Kalman smoothing (EKS) algorithm The unscented Kalman filter Each chapter, with the exception of the introduction, includes illustrative applications of the learning algorithms described here, some of which involve the use of simulated and real-life data. Kalman Filtering and Neural Networks serves as an expert resource for researchers in neural networks and nonlinear dynamical systems. An Instructor's Manual presenting detailed solutions to all the problems in the book is available upon request from the Wiley Makerting Department.

Book Information

Hardcover: 304 pages

Publisher: Wiley-Interscience; 1 edition (October 8, 2001)

Language: English

ISBN-10: 0471369985

ISBN-13: 978-0471369981

Product Dimensions: 6.4 x 0.8 x 9.7 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 starsÂ Â See all reviewsÂ (1 customer review)

Best Sellers Rank: #1,654,418 in Books (See Top 100 in Books) #175 inÂ Books > Computers & Technology > Computer Science > AI & Machine Learning > Neural Networks #2643 inÂ Books > Computers & Technology > Certification #4969 inÂ Books > Engineering & Transportation > Engineering > Telecommunications & Sensors

Customer Reviews

This book is very coherent in its exposition of ideas and reads almost like an "authored" book. There are some redundancy in explanation of ideas by different authors, but proper references are made to other chapters in the book (that were written by other authors) for a complete explanation.You can find a self contained explanation of Extended Kalman Filter, Unscented Kalman Filter, and Particle Filter as applied to machine learning, where you have some parameter values to be automatically identified such as in weights for neural networks.My interest was primarily in Unscented Kalman Filter and the book was detailed enough so that I could code my own Unscented Kalman Filter and reproduce some examples in the book. In the process, I had to look up on the internet on Robbins-Monro Algorithm because the book lacked a detailed explanation about it even though it was a suggested method for updating innovation covariance. Overall, the explanations were clear, and it has been a smooth process from reading this book to applying the algorithms to my own problem at hand.

Comprehensive Foundation (2nd Edition) Elements of Artificial Neural Networks (Complex Adaptive Systems) Manual of Microsurgery on the Laboratory Rat. Part 1: General Information and Experimental Techniques (Techniques in the Behavioral and Neural Science, 4) (Pt.1)