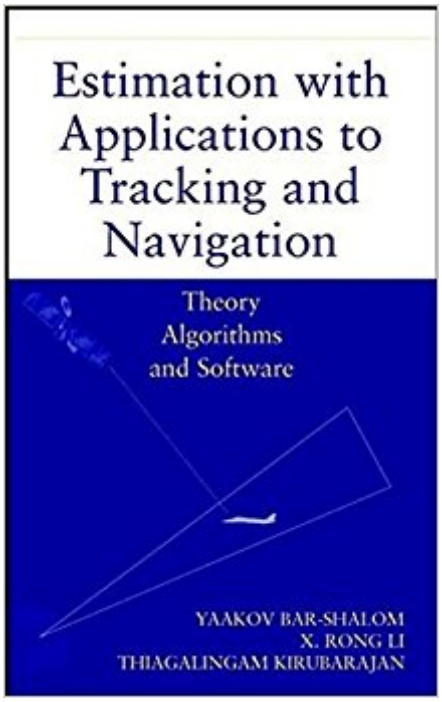
# Estimation With Applications To Tracking And Navigation



## Synopsis

Expert coverage of the design and implementation of state estimation algorithms for tracking and navigation Estimation with Applications to Tracking and Navigation treats the estimation of various quantities from inherently inaccurate remote observations. It explains state estimator design using a balanced combination of linear systems, probability, and statistics. The authors provide a review of the necessary background mathematical techniques and offer an overview of the basic concepts in estimation. They then provide detailed treatments of all the major issues in estimation with a focus on applying these techniques to real systems. Other features include:  Problems that apply theoretical material to real-world applications In-depth coverage of the Interacting Multiple Model (IMM) estimator Companion DynaEst(TM) software for MATLAB(TM) implementation of Kalman filters and IMM estimators Design guidelines for tracking filters  Suitable for graduate engineering students and engineers working in remote sensors and tracking, Estimation with Applications to Tracking and Navigation provides expert coverage of this important area.

## Book Information

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## Customer Reviews

This text--set of lecture notes--presents the material from a second semester graduate level course on estimation offered in the Dept. of Electrical and System Engineering at the U. of Connecticut. The main goal of the course is to convey the knowledge necessary for the evaluation and design of state estimators that operate in a stochastic environment. The material covers the topics usually taught in control-oriented EE/systems and aeronautical engineering programs. The prerequisites are

a solid knowledge of linear systems and probability theory at the first semester graduate level. Annotation copyright Book News, Inc. Portland, Or.

Expert coverage of the design and implementation of state estimation algorithms for tracking and navigation  Estimation with Applications to Tracking and Navigation treats the estimation of various quantities from inherently inaccurate remote observations. It explains state estimator design using a balanced combination of linear systems, probability, and statistics.  The authors provide a review of the necessary background mathematical techniques and offer an overview of the basic concepts in estimation. They then provide detailed treatments of all the major issues in estimation with a focus on applying these techniques to real systems. Other features include: * Problems that apply theoretical material to real-world applications * In-depth coverage of the Interacting Multiple Model (IMM) estimator * Companion DynaEst(TM) software for MATLAB(TM) implementation of Kalman filters and IMM estimators * Design guidelines for tracking filters  Suitable for graduate engineering students and engineers working in remote sensors and tracking, Estimation with Applications to Tracking and Navigation provides expert coverage of this important area.

This is an excellent book for applications of Optimal Estimation to Target Tracking using Kalman Filtering techniques. As such, it belongs on the desk of every serious designer of Target Tracking algorithms. I have read this book cover to cover and found it extremely useful for learning and as a reference. The book is co-authored by Princeton’s Dr.Yaakov Bar-Shalom whose several lectures using this book I have personally attended and enjoyed at UC Storrs. He is the King of Tracking algorithms. I recommend this book without any reservations.

The electronic kindle version of this book is not readable. The electronic version of this book is filled with errors. I bought the hardcover after trying the electronic version. Fortunately, the physical book has no issues.The math in it is good too.

I purchased a book that’s a likeNew. It was shipped very fast; I got it in a few days after I ordered. The book was actually new - no bent and clean like new.Awesome seller. Thanks :)

I have had this book for a while now. It was on the shelves of a collegues desk, collecting dust, when I started working with tracking a little over a year ago with no prior background in the field (I am a physicist). It is now no longer collecting dust at it is now on my shelves instead. For the first

introductory steps within this field, I found the book a little too advanced. However, after having spend some time on some more introductory and old school texts, like "Tracking and Kalman Filtering made Easy" by Brookner, I have learned to appreciate the enourmous usefulness of this book.The formalism is very concise. The choise of symbols is consistent and logical througout the book. The words and terminology is very precise, which has become evident to me, after reading other sources. The examples are very useful and spot on for many of my applications. Like the two-model uniform motion/nearly coordinated turn IMM as an excellent estimator workhorse in tracking.Just this morning, I was struggling to understand the term "dilution of precision" - a measure, which is available in various flavours in some GPS devices. I had searched the net, read on Wikipedia, etc, but still could not quite get my grips on the exact meaning of the term. Then I recalled I had "the purple book". I looked up "dilution of precision", and of course, the term was explained in the most useful and concise way there on a little more than a page, following a treatment of other GPS accuracy terms, which set things quite well in perspective, and made me understand GPS accuracy much better.Many of the problems are already very useful for specific applications. Solving the problems actually gives very useful results.The book has steadily grown into my favorite resource for the estimation part of tracking and one of the best text books I have available, like Numerical recipes.... I simply enjoy reading it, and as I flip through the pages I find more and more useful stuff, especially in the last chapters. With text books it is often such that the last chapters become harder and harder and more and more marginal for practical use. Here, although the later parts are more advanced, they are also increasingly useful - for me at least.

I use this outstanding text in combination with Robert Brown’s inexpensive older edition (Introduction to Random Signals and Applied Kalman Filtering, 3rd Edition (Book only)) to teach Kalman filtering in robotics. The one note to add to the wonderful reviews here, with which I wholeheartedly agree, is Wiley has also now made this volume available free as a pdf on their online library. Just Google the title with pdf and wiley (with Shalom) and you’ll find the link. I still have a hard copy I use for my classes that I got used at Abe Books (an  sister company) for $10 US, but if you’re on a tight budget, the pdf will do the trick here in 2015.

Try "Advanced Kalman Filtering, Least-Squares and Modeling" by Bruce P. Gibbs instead. Much more grounded and concrete. Perhaps Yaakov’s exposition simply didn’t fit my style.

I think any person who major in target tracking system related to the Kalman filter must see this

book. This book present the fundamentals of state estimation theory and the tools for the design of state-of-the-art algorithms for target tracking. The book covers the basic concepts and estimation techniques for static and dynamic systems, linear and nonlinear, as well as adaptive estiomation. This constitutes a one semester graduate course in estimation theory in an electrical/systems engineering program. The discussion deals mainly with discrete time estimation algorithms, which are natural for digital computer implementation. The basic state estimation algorithm-the Kalman filter-is presented in discrete as well as in continuous time. The use of the estimation algorithms is illustrated on kinematic motion models because they reveal all the major issues and in particular the subtleties encountered in estimation, and this serves as an introdution to tracking. Guidelines for tracking filter design-selection of the filter design parameters-are given and illustrated in several examples. At the end of each chapter, a number of problems that enhance the understanding of the theory and the connection of the theoretical material to the real world are given. And I have this book as text for my paper.

I don’t usually write online reviews but this book is so clear and useful that I really want to recommend it to others. It is well written with a good outline and summary for every chapter. It also has a pretty diverse range of topics on estimation, including an introductory chapter on basic estimation approaches (e.g., ML, MAP, least squares), and very practical extensions (e.g., state augmentation, square-root filters). Even though I am not in EE and some of the examples are thus not particularly helpful to me, I still find this book one of the best of all the estimation/Kalman filter books out there.

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