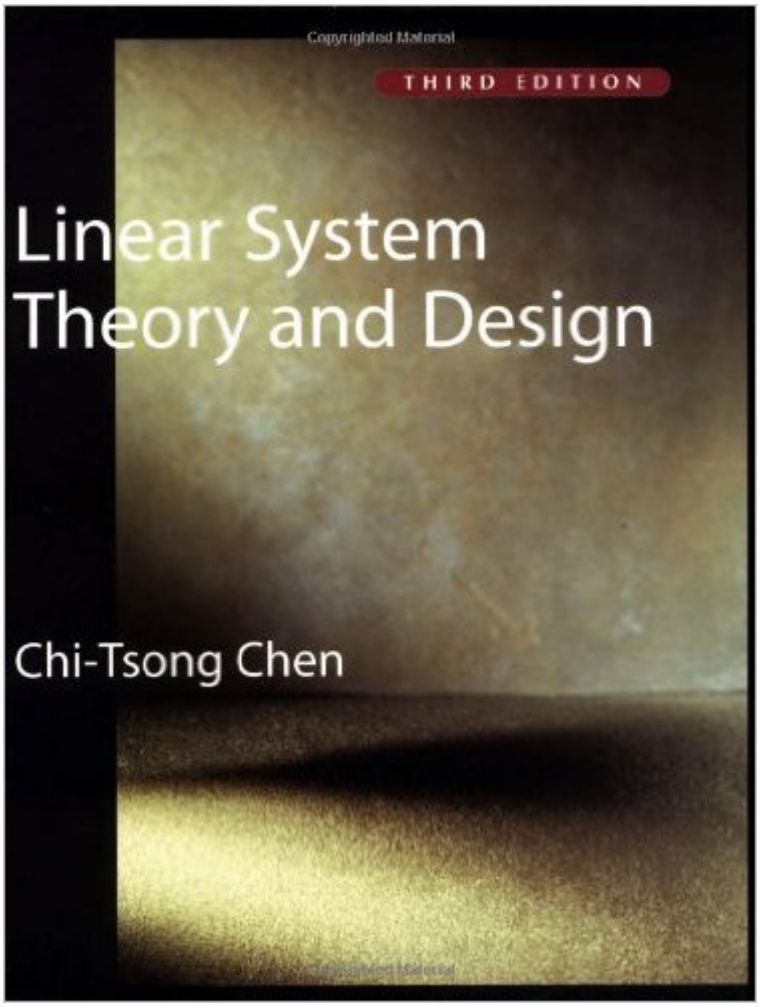
Linear System Theory And Design (The Oxford Series In Electrical And Computer Engineering)



Synopsis

An extensive revision of the author's highly successful text, this third edition of Linear System Theory and Design has been made more accessible to students from all related backgrounds. After introducing the fundamental properties of linear systems, the text discusses design using state equations and transfer functions. In state-space design, Lyapunov equations are used extensively to design state feedback and state estimators. In the discussion of transfer-function design, pole placement, model matching, and their applications in tracking and disturbance rejection are covered. Both one-and two-degree-of-freedom configurations are used. All designs can be accomplished by solving sets of linear algebraic equations. The two main objectives of the text are to: Â use simple and efficient methods to develop results and design procedures Â enable students to employ the results to carry out design All results in this new edition are developed for numerical computation and illustrated using MATLAB, with an emphasis on the ideas behind the computation and interpretation of results. This book develops all theorems and results in a logical way so that readers can gain an intuitive understanding of the theorems. This revised edition begins with the time-invariant case and extends through the time-varying case. It also starts with single-input single-output design and extends to multi-input multi-output design. Striking a balance between theory and applications, Linear System Theory and Design, 3/e, is ideal for use in advanced undergraduate/first-year graduate courses in linear systems and multivariable system design in electrical, mechanical, chemical, and aeronautical engineering departments. It assumes a working knowledge of linear algebra and the Laplace transform and an elementary knowledge of differential equations.

Book Information

Series: The Oxford Series in Electrical and Computer Engineering
Hardcover: 352 pages
Publisher: Oxford University Press, USA; 3 edition (September 10, 1998)
Language: English
ISBN-10: 0195117778
ISBN-13: 978-0195117776
Product Dimensions: 9.4 x 0.9 x 7.6 inches
Shipping Weight: 1.8 pounds
Average Customer Review: 4.2 out of 5 starsÂ Â See all reviewsÂ (20 customer reviews)
Best Sellers Rank: #512,520 in Books (See Top 100 in Books) #102 inÂ Books > Textbooks >

Engineering > Electrical & Electronic Engineering #147 inÂ Books > Science & Math > Physics > System Theory #251 inÂ Books > Computers & Technology > Computer Science > Systems Analysis & Design

Customer Reviews

Up to this time,there are no 5 stars books in Linear Systems. However, this book is one of the best 4 stars books available for the subject. Through the book, the author sometimes assumes that you know or understand some topic, formula,...etc. without mentioning it. However,you can do it, but it may take you some time to figure out what it is. If you are good enough in linear algebra you will have no problems to handle the book up to the last page. Chapter 2 & 3 are the most important chapters in the book because they prepare you for the rest of the book. MATLAB is being used in a nice and helpful way to visualize some concepts and applications of the linear control theory. I recommend this book as a textbook for an introductory linear systems course and also for self teaching purposes.

My overall impression with this book is: satisfactory. Though there are a more errors then desired, and a few that are pretty confusing, the majority of the book is accurate and very instructive. I would recommend this book as a reference for introductory treatment of Linear System Theory and DI just completed this book in the beginning of March. Having a Controls background I found this book both helpful and instructive, yet lacking in sufficient detailed explanation on some tough topics. Chapter 2: 'Mathematical Descriptions of Systems' was very helpful with the detailed definitions and easy examples. Chapter 3: 'Linear Algebra' is a chapter that could use expanding. Some of the topics addressed in this section are speedily discussed and rapidly completed. The first edition of this book was chided for it length. This edition must be chided for it brevity. However, when lack of explanation abounds, examples and homework problems can make up for deficient instruction. Chapters 4 through 6 are easy to follow and through in their treatment. Chapter 7, however, is another chapter where too much explanation was removed. The examples are hard to follow in this chapter, and there are a few very confusing mistakes. Chapters 8 and 9 are very well written, though confused at times. However, they yield a sufficient knowledge of the addressed topics.My overall impression with this book is: satisfactory. Though there are a more errors then desired, and a few that are pretty confusing, the majority of the book is accurate and very instructive. I would recommend this book as a reference for introductory treatment of Linear System Theory and Design.esign.

This is the first textbook for grad-level control systems.It is engineering textbook, so it shows derivation, but doesn't show any rigorous proof.Organization, explanation, examples... everything is very good.I took a class that uses only class note, and this textbook saved me.It doesn't skip any step nor use any esoteric math.Also, it has many examples.Overall, a friendly textbook for control engineers.

I found this book to be inadequate at all levels. It does not go into sufficient detail for beginners, and neither does it provide rigor for the experienced controls student. Do yourself a favor and buy separate texts for the basics (like Brogan's Modern Control Theory) and for the advanced.

This is one of the best books on linear systems at a junior graduate level. On the positive side, the book is well organised, clearly written, brings a fair amount of solved examples, exercises with answers, tips on using Matlab. The linear algebra approach to the topic is adequate (sometimes too specific) and elegant. If I stopped here, it would sound like a five star book. However, there are some aspects that will not let me give it five stars. First and foremost is the total lack of references that would help the reader link the material with its historical origin. One example of this will suffice: the paper clearly presents the concepts of observability, controllability, Kalman decomposition etc. and not one work by Kalman is to be found on the reference list. In second place, and not so grave as the first point, is the fact that some topics that are dear to the author are given what in my opinion is undue emphasis along the text. Students tend to imagine that such topics are fundamental, when they are not. Overall it is a very good book, and it has been my first choice as a textbook for teaching linear systems in state-space to graduate students.

This book will not be appreciated by a junior control student.Senior students will be very pleased by the content of the book.Very direct, very dense and cover all necessary aspects for a first year senior course in state-space control theory.This book, as it should be, is very linear algebra oriented. The author places a strong review in some necessary aspects of linear algebra in order to provide the student the capability of going on with the content in the book without pulling a linear algebra book from the shelf.

I thought this book was very useless. We had a homework problem assigned (The one describing a satellite in orbit around Earth asking us to solve for its movement using Lagrange's equation in CH1

) and found many errors in the solutions provided by Chen. I understand Chen is very good at what he does, but he is NOT the brightest in explaining and demonstrating his ideas to graduate students. His examples are very hard to follow and 2 of my fellow classmates opted for purchasing other textbooks to actually learn from. Some of these books were in linear algebra and other on modern control.This book is only good, in my opinion, if you have the solutions manual because otherwise the problems solved within the chapter are not easy to understand. Chen skips many crucial steps stalling the reader from getting useful info required for class. I never used the solns manual; but from other classes, I have found them to be a great tool to moving swiftly through the homework and really getting experience in solving problems "the right way." The solns manual is being sold here on for $40.As a reference I used Modern Control Engineering by Paraskevopoulos, P. N (2002) and it proved to be extremely helpful. There are also other books similar to this out there, you just have to search.

Engineering) Principles of Semiconductor Devices (The Oxford Series in Electrical and Computer Engineering) Analog Methods for Computer-Aided Circuit Analysis and Diagnosis (Electrical and Computer Engineering)