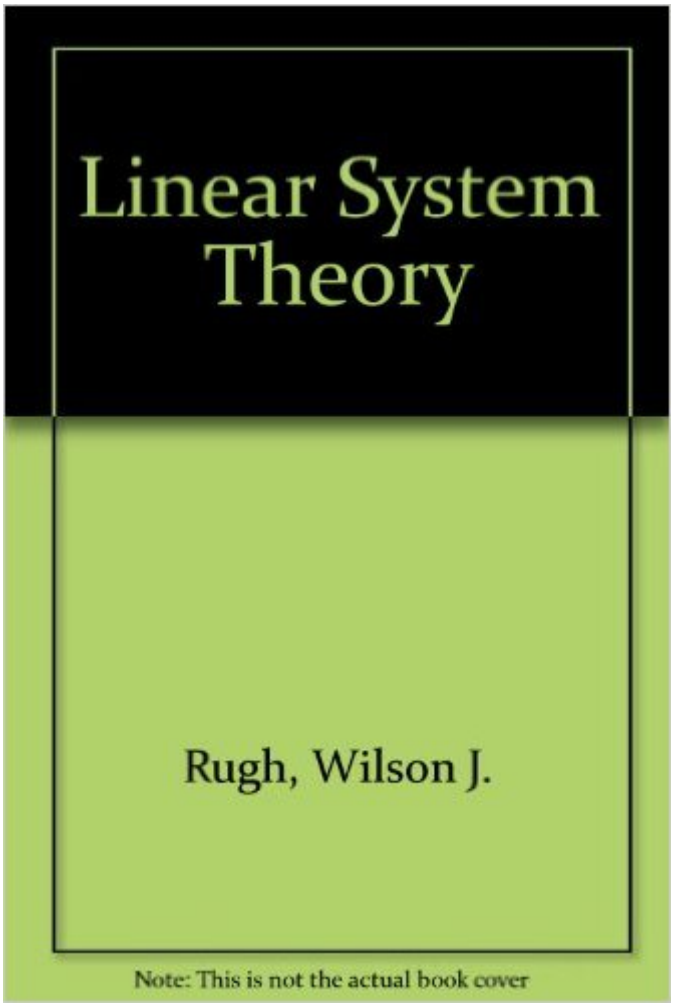
Linear System Theory



Synopsis

This introduction to linear system theory has been class tested at several universities. It focuses on time-varying linear systems, with frequent specialization to time-invariant case. Optional chapters pursue refinements and extensions, many confined to time-invariant linear systems. This text offers a clear, careful theoretical treatment, as well as modular organization for flexibility and provides compact, basic treatments of esoteric topics such as the polynomial fraction description and the geometric theory. There are also results that have not previously appeared in text form, for example, realization theory for time-varying linear systems, noninteracting control for time-varying linear systems and output feedback stabilization for time-varying linear systems. This text is intended for graduate level courses in linear system theory, theory of time-varying linear systems and linear state equations.

Book Information

Hardcover: 368 pages
Publisher: Prentice Hall (June 1992)
Language: English
ISBN-10: 0135550386
ISBN-13: 978-0135550380
Product Dimensions: 0.8 x 7.2 x 9.8 inches
Shipping Weight: 1.6 pounds
Average Customer Review: 2.3 out of 5 starsÂ Â See all reviewsÂ (6 customer reviews)
Best Sellers Rank: #1,592,041 in Books (See Top 100 in Books) #144 inÂ Books > Computers & Technology > Computer Science > Cybernetics #982 inÂ Books > Textbooks > Humanities > Library & Information Science #1693 inÂ Books > Politics & Social Sciences > Social Sciences > Library & Information Science > General

Customer Reviews

This is an authoritative book on linear systems theory, containing a good blend of state space methods, transfer matrix methods, and geometric theory. It is not necessarily an easy read, but it is thorough. As an example, many linear systems theory books "cheat" when presenting the solution of linear time invariant system: they assume that the structure of the solution is already known, e.g. that the solution is of the form x(t) = exp(At)*z(t) where z(t) is then shown to have the desired form. In Rugh’s book, instead, few assumptions of prior knowledge are used. This necessarily makes the proof more demanding, but also leads to a more realistic problem -- for students who want to really

understand how to develop new results.There are other valuable -- and simpler books. E.g. Chen's book in its third edition is very nice wrt. relating the various methods of analysis with standard linear algebra methods such as QR decomposition, etc.

This was the prescribed book for a Linear Systems course I took. The author believes in discovering various facets of the subject through the exercise problems. As a result, it is not the best book to be used for self study. Also, continuous and discrete systems are treated independently of each other, so one has to keep turning the pages back to understand various analogies. The book by Antsaklis/ Michel is a better choice. Being taught by a good instructor however does offset some of the problems. Another irritating point was the poor quality of the bind. I had pages coming out two months into the semester :(

I got the book for a course I was taking in my masters program. I had taken one Linear Systems course in my undergraduate. While I bought the book new, it didn't make it through HALF of the semester before the binding broke and pages fell out. The book omits many useful proofs, and if it doesn't omit the proof, it expects you to figure out on your own with very little prompting. It does have some useful examples but assumes the reader has a VERY broad and deep understanding about linear algebra and calculus. It's very high level and often difficult to follow.

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