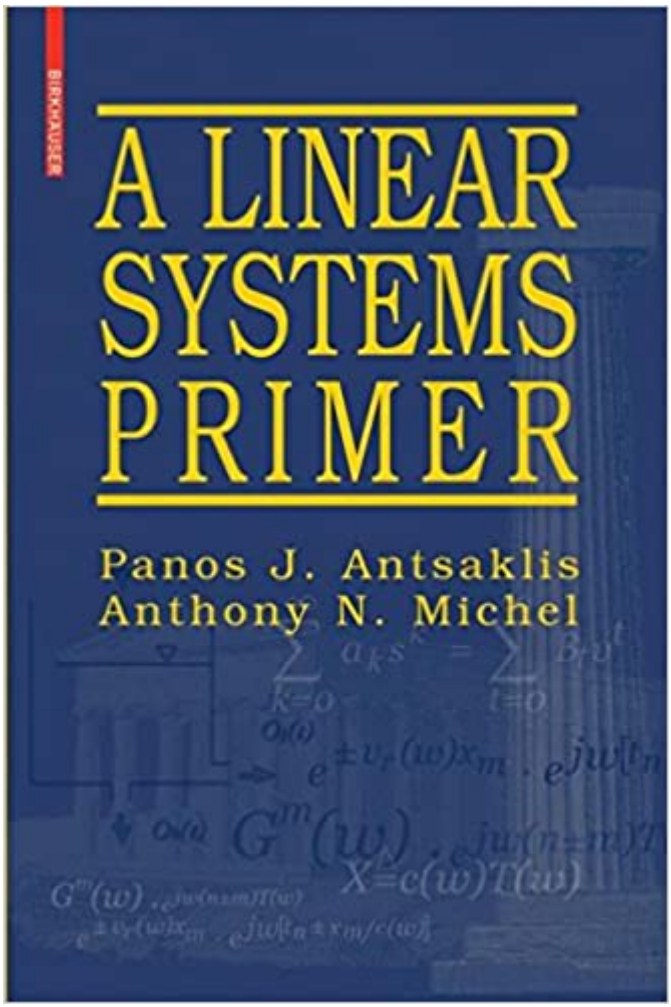
A Linear Systems Primer



Synopsis

Based on a streamlined presentation of the authorsÃ¢â ¬â„¢ successful work Linear Systems, this textbook provides an introduction to systems theory with an emphasis on control. Initial chapters present necessary mathematical background material for a fundamental understanding of the dynamical behavior of systems. Each chapter includes helpful chapter descriptions and guidelines for the reader, as well as summaries, notes, references, and exercises at the end. The emphasis throughout is on time-invariant systems, both continuous- and discrete-time.

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Customer Reviews

From the reviews: "This book is an excellent addition to existing textbooks on linear systems theory. With emphasis on topics and results that are fundamental to systems theory and control, the book strikes a balance between breadth and depth, and between basics concepts and tools and mathematical rigor. The book is clearly written, and its presentation is transparent and smooth. It is an excellent textbook for a one-semester, first-year graduate-level course on linear systems theory. Indeed, I have adopted this book as the textbook for the linear systems course that I teach. The book is also a useful reference for researchers and engineering practitioners. Ã¢â ¬â ¢Lihua Xie, IEEE Control Systems Magazine "The primer is an introduction to systems, geared to advanced undergraduate and graduate students. The authors are prominent and authoritativeÃ¢â ¬Â¦Topic coverage is broad, ranging from basics like system models, controllability, and observability, to state feedback and controllers with two degrees of freedom. Ten brief appendixes cover basic

background material such as vector spaces and eigenvalues. Summing up: Recommended. Upper-division undergraduates through faculty. Ã¢â ¬â ¢CHOICE "This is a textbook introduction to system theory and linear systems control, for a one-semester course at the first-year graduate level Ã¢â ¬Â¦ . This primer is aimed essentially at course use, with an emphasis on key results and essential theory.Ã¢â ¬Â¦ Each chapter ends with a useful Ã¢â ¬Ëœsummary and highlightsÃ¢â ¬â„¢ section and well-documented historical notes pointing back to the technical literature. Ã¢â ¬â ¢Didier Henrion, Mathematical Reviews Ã¢â ¬Å“The book A Linear Systems Primer is a streamlined presentation of the book Linear Systems Ã¢â ¬Â¦ of the same authors. It provides an introduction to system theory with an emphasis on control theory. Ã¢â ¬Â¦ The book is accompanied by many illustrative examples Ã¢â ¬Â¦ . used as a textbook for senior undergraduate of a typical one-semester course introduction to linear systems primarily for first-year graduate and senior undergraduate students in engineering, but also in mathematics, physics and the rest of the sciences.Ã¢â ¬Â• (Nicholas Karampetakis, Zentralblatt MATH, Vol. 1168, 2009)

Based on a streamlined presentation of the authors' successful work Linear Systems, this textbook provides an introduction to systems theory with an emphasis on control. The material presented is broad enough to give the reader a clear picture of the dynamical behavior of linear systems as well as their advantages and limitations. Fundamental results and topics essential to linear systems theory are emphasized. The emphasis is on time-invariant systems, both continuous- and discrete-time. Key features and topics: * Notes, references, exercises, and a summary and highlights section at the end of each chapter. * Comprehensive index and answers to selected exercises at the end of the book. * Necessary mathematical background material included in an appendix. * Helpful guidelines for the reader in the preface. * Three core chapters guiding the reader to an excellent understanding of the dynamical behavior of systems. * Detailed coverage of internal and external system descriptions, including state variable, impulse response and transfer function, polynomial matrix, and fractional representations. * Explanation of stability, controllability, observability, and realizations with an emphasis on fundamental results. * Detailed discussion of state-feedback, state-estimation, and eigenvalue assignment. * Emphasis on time-invariant systems, both continuous- and discrete-time. For full coverage of time-variant systems, the reader is encouraged to refer to the companion book Linear Systems, which contains more detailed descriptions and additional material, including all the proofs of the results presented here. * Solutions manual available to instructors upon adoption of the text. A Linear Systems Primer is geared towards first-year graduate and senior undergraduate students in a typical one-semester

introductory course on systems and control. It may also serve as an excellent reference or self-study guide for electrical, mechanical, chemical, and aerospace engineers, applied mathematicians, and researchers working in control, communications, and signal processing. Also by the authors: Linear Systems, ISBN 978-0-8176-4434-5.

Linear Systems Primer serves as a very good reference at the graduate and/or professional level. The mathematics are very thorough (proofs included) in regards to linear time-invariant systems. However, I would not recommend this book as your source for explanations of the concepts or physical meaning lying behind all the math. In engineering, one often encounters what I consider as "engineering" books and "math" books. For me, this one falls under the category of math book. If you can understand concepts through other means, this book can serve as a good reference.

This is an effective text book, but you should really go through it in a class. It is very technical and would be hard to understand if you want to teach yourself or use as a reference with no background.

Book was exactly as advertised and shipped in a timely fashion. Received in brand new condition. Incredibly, some of the textbook rental companies want MORE to rent this book than I paid to own a copy.

I used this book for graduate course on linear systems theory. The book covers all important parts of linear systems theory. All the parts are very good explained. I think the style of the book is friendly to newcomers and certainly is suitable for graduate students. Every chapter contains a lot of examples that always help understanding the theory. I really liked studying with this book and I still use it as a reference.

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