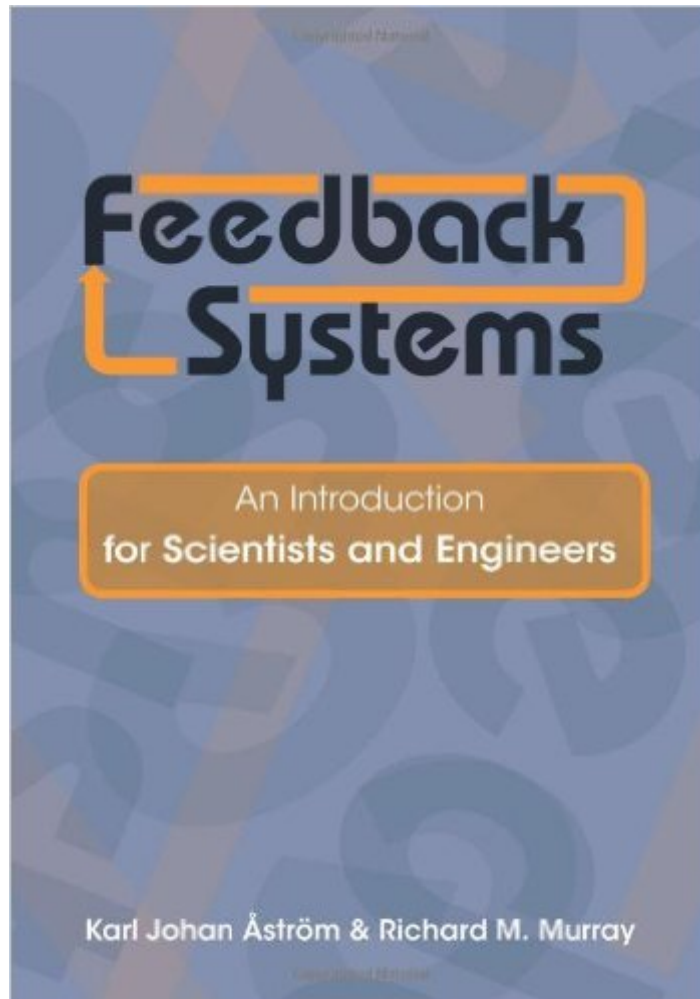# Feedback Systems: An Introduction For Scientists And Engineers

Synopsis

This book provides an introduction to the mathematics needed to model, analyze, and design feedback systems. It is an ideal textbook for undergraduate and graduate students, and is indispensable for researchers seeking a self-contained reference on control theory. Unlike most books on the subject, Feedback Systems develops transfer functions through the exponential response of a system, and is accessible across a range of disciplines that utilize feedback in physical, biological, information, and economic systems. Karl Ã…strÃ¶m and Richard Murray use techniques from physics, computer science, and operations research to introduce control-oriented modeling. They begin with state space tools for analysis and design, including stability of solutions, Lyapunov functions, reachability, state feedback observability, and estimators. The matrix exponential plays a central role in the analysis of linear control systems, allowing a concise development of many of the key concepts for this class of models. Ã…strÃ¶m and Murray then develop and explain tools in the frequency domain, including transfer functions, Nyquist analysis, PID control, frequency domain design, and robustness. They provide exercises at the end of every chapter, and an accompanying electronic solutions manual is available. Feedback Systems is a complete one-volume resource for students and researchers in mathematics, engineering, and the sciences. Covers the mathematics needed to model, analyze, and design feedback systems Serves as an introductory textbook for students and a self-contained resource for researchers Includes exercises at the end of every chapter Features an electronic solutions manual Offers techniques applicable across a range of disciplines

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Customer Reviews

The authors did a poor job in explaining many vital concepts. Apparently they failed to pay attention to their narratives and the writing is too casual for such a highly technical material. Throughout the book I have written down numerous notes to correct errors or clarify confusions due to the authors' ambiguous expressions and careless uses of technical terminologies. Just for one example, the treatment of stability (section 4.3) is a mess -- if you really pay attention when you are reading the text you will understand what I mean. The authors' original intention of presenting basic dynamical systems and control knowledge to a broad scope of audience is commendable, but unfortunately the book simple does not do the job. Seriously I would recommend those classical, rigorous texts such as Antsaklis & Michel (Linear Systems), Khalil (Nonlinear Analysis). A good introductory alternative, although light on transfer function approach, is Luenberger's dynamical systems. It was good that I did not use this book as my starter but I would warn those who hope to do so.ps: I may have been a bit biased, but seriously I think it is dangerous to study a highly technical topic by using a casual textbook.

It's a pretty good book. I got it for a university class. There's a lot of errors in the book though (~20 errata per chapter) for the first edition. Still, it explains things reasonably well, and is a pretty good place to start. Requires a decent linear algebra background to understand most of the early material.

I used this book in a course on classical control theory. It's a great book for explaining concepts in control theory. You'll need background in calculus, differential equations, and linear algebra in order to understand it.The book is great for giving you an understanding of control theory. Whoever said that there are errors in the book is correct, and you will notice errors if you choose to work out the steps that the author chooses to skip. The author has created a list of Errata to go through at [...]

Needed this for a class. Ended up not using it too much, and when we did use it the book it often contradicted what was taught in class and was certainly not used in the same order. Other controls & systems textbooks I have read are much more concise and less abstract than this one.

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