

BOOK REVIEW

Bernard Friedland, *Control System Design*, 513 pages, \$45.00, McGraw-Hill, New York, 1986.

Many control engineers educated in the frequency-domain design methods of control systems have felt that the state-space approach is a mathematical exercise which suits only graduate research. State-space methods, however, have been applied in the U.S. Apollo project and in a few other high-technology applications. The purpose of this book is to demonstrate that state-space methods not only provide a design philosophy of control systems, but also have useful results. The author shows that both state-space and frequency domain methods are useful and complement each other.

The usefulness of the state-space results is demonstrated through design examples. Since to start a meaningful and comprehensive example, or a homework problem, in an advanced chapter of a book is quite complex and tedious, the author had an excellent idea. He selected about 15 examples and homework problems and developed them gradually throughout the text. Several of the examples start in Chapter 2 or 3 and are taken again and again later in the book. Unfortunately, my students disliked the idea (I used the book as a text in a graduate course). They complained that in Chapter 9, for example, they had forgotten how the example had started in Chapter 3. The obvious response that they should review the material, was not welcomed.

A disadvantage of the book is that discrete systems are not mentioned and only the continuous case is discussed. The addition of a chapter or two discussing sampled-data systems and difference equations would make the book more balanced.

Nevertheless, I like the philosophical approach to the topics and the broad perspective of their presentation. It is an excellent approach to the education of graduate students. The author is both a scholar and an applied engineer, a combination which is reflected in the text by the mathematical treatment of the subjects and the emphasis on applications. Overall, a recommended text that I plan to use again.

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