

amples. Included, prominently, are the Cuban missile crisis and the American Medical Association's study of the effect of aspirin on heart attacks. These and other examples provide a sense of relevance uncommon among statistics textbooks. I also appreciate the historical notes. This book is interesting to read.

Some familiar topics are described in moderate detail: null hypotheses, chi-squared tests, regression, discrete event simulation, Bayes' theorem, opportunity loss, expectation, expected utility, and objective hierarchies. Chacko also discusses several less familiar techniques, such as fuzzy sets, penalty for nonfulfillment, and the bluff-threats matrix.

His writing style is highly structured. However, much of the book's organization logic was unclear to me.

Each of the five sections begins with a hierarchical topic diagram. A detailed abstract prefaces each chapter. The 10 actual chapters are reinforced by brief endings that include

- Concluding observations,
- Questions: concepts and computations for commitment,
- Conclusions,
- [Resource] commitments, and
- Caveats.

The last section, chapter 11, devotes 34 pages to answers to questions in which the most important elements are described. The book's structure is apparent, and the book should stimulate considerable class discussion.

A post-note indicates that this is Professor Chacko's 39th book. I hope that a second edition will be forthcoming, with refinements drawn from classroom testing.

The formula typesetting style is annoying and possibly confusing in places.

Chacko describes his book as being "ideal for the practitioner." It is unclear what he means, because it is clearly not a handbook. However, as a decision analysis practitioner, I found substantial value in reading this as an idea book.

Overall, I think this is a good text. I agree with the author that it is suited to a one- or two-semester graduate or advanced-undergraduate course. A prior course in statistics would be needed to appreciate the material. Most techniques are described in only moderate depth, and the reader will probably seek more complete references for topics of serious interest.

I suspect that a course with this text would be popular with students because the book contains so many powerful ideas and real-world examples.

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JAIN, RAJ 1991, *The Art of Computer Systems Performance Analysis, Techniques for Experimental Design, Measurement, Simulation and Modeling*. John Wiley and Sons, Inc., New York, 720 pp. \$49.95.

This book aims to be a comprehensive textbook for the computer professional who designs, procures, or uses computer systems; and it is indeed an extremely comprehensive book that can be used for both classroom instruction and self study.

Performance analysis is a key step in the design and procurement of new computer systems, and the book provides the reader with a wide variety of performance analy-

sis techniques that are simple and straightforward and require a minimum level of statistical sophistication.

The major sections are measurement techniques and tools, probability and statistics, experimental design and analysis, simulation, and queuing models; and there is also an introductory section featuring the mistakes often made in performance analysis.

The book's 36 chapters are organized so that each can be presented in 45 minutes. This makes the book ideally suited for a one-semester course, since some elementary material related to statistics and eventually some of the more advanced material related to queuing theory can be omitted.

No prior knowledge of computer systems performance analysis is assumed, but the reader should have a general familiarity with computer systems. The emphasis is on practical techniques that could be used without a great deal of mathematical sophistication, and the author has attached proper importance to the limitations, shortcomings and pitfalls of the techniques presented.

Jain illustrates the analysis techniques discussed in the book with examples and case studies covering a wide variety of subsystems from actual computer systems design projects. To further illustrate the use and misuse of various techniques in the literature, he presents several examples of analysis published in technical journals.

Most performance problems are unique, so the metrics, work loads, and evaluation techniques used for one problem generally cannot be used for the next problem. Jain provides the reader with a systematic approach to performance analysis: how to

state goals and define the system; how to select metrics, factors to study, evaluation techniques, and work load; how to design experiments; and finally how to analyze, interpret, and present data.

The section on experimental design and analysis includes factorial designs, factorial designs with replications, fractional factorial designs and descriptions of one-factor, two-factor, and general full factorial design; moreover, the section on simulation includes techniques for analysis of simulation results, random-number and random-variate generation, testing random-number generators, and a chapter about commonly used distributions. These sections are all well organized and easy to read. If the reader has knowledge of statistics or simulation already, they can easily be skipped.

The last section on queuing models is mathematically the most demanding section, but the author provides a pragmatic and practical introduction to such topics as analysis of a single queue, queuing networks, operational laws, mean-value analysis and related techniques, and hierarchical decomposition of queuing networks.

I have only one criticism, and that is that there are very few references in the individual chapters. After the major sections a number of references are listed in a short "further reading" section, but the book would have been more useful if some key references had been incorporated in the text.

Overall, Jain's *The Art of Computer Systems Performance Analysis* is both a practical addition to the library of anyone whose work includes performance evaluation, simulation of systems, or systems testing and a brilliant introductory textbook.

BOOK REVIEWS

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BRANT, BOB 1991, *Build Your Own Macintosh and Save a Bundle*, Windcrest Books, Blue Ridge Summit, Pennsylvania, 221 pp., \$17.95.

Compared to PC computers, compatibles, and clones that run MS DOS, the Macintosh family still requires a hefty expenditure to obtain a reasonable computing capability. Even with the announcement of new family members in October 1990, prices still remain 10 to 30 percent higher than functionally comparable systems (arguments about user interfaces, ease of use, and so forth aside). Thus, Bob Brant's book is a welcome addition for the do-it-yourselfer community. It is not recommended for the casual user who does not understand hardware components, electronics, or operating systems.

Price and performance are the driving issues behind every design decision in building the "Cat Mac"—Brant's name for his home-grown Macintosh clone. As discussed in chapter 2, a comparison of the Apple Macintosh SE and the Cat Mac SE shows that you can expect to save between 25 and 50 percent of the cost of purchasing a new Apple Macintosh SE. Similar savings, as Brant points out in several sections, can be obtained for other members of the Macintosh family.

Chapter 1 examines the make-or-buy decision using several criteria. Assuming you decide to build a Cat Mac, chapter 2 examines the potential configurations and provides a cost analysis of each. Using this information, you can determine which ma-

chine will fit your budget. Chapter 2 is a thorough economic analysis of the alternative members of the Cat Mac family. Read this chapter before starting to plan your system! My impression from reading these chapters is, if you are not constrained by budget, to go for a Cat Mac based on the 68030 chip as that will be the baseline for Apple for the next several years.

Chapter 3 seems out of place and, unfortunately, contains some outdated information. It discusses the Atari Mac emulator, Mac clones, of which there are very few, and Mac portables. The Atari Mac emulator is a board that plugs into the Atari Mega 2 or 4 series bus which contains a Macintosh ROM. Brant's information on Mac clones is outdated since one of the companies mentioned has been dissolved. His discussion of alternatives to the Mac portable is too brief given the excellent quality of the Dynamac product.

In a step-by-step process, Brant lays out the design decisions and alternatives for each of the major components of the Cat Mac SE: logic board, power supply, floppy disk, hard disk, video board, video display unit, and keyboard and mouse. Chapters 4 and 6 through 10 discuss each of these components and provide information on sources of these components. Each chapter is devoted to examining the physical characteristics of the component with numerous diagrams and pictures. These are helpful in orienting you when you actually begin to build the Cat Mac SE. I recommend that you read these chapters once, then again, before deciding on the final configuration for your machine. Moreover, map out various configurations based on cost and capacity before settling on a final con-