tional training model. Chapter 13 reviews the methods and tools of human factors engineering (HFE). The chapter includes short sections on the following methods and tools: time-motion studies, link analysis, operational sequence diagrams, task analysis, workload analysis, accident and incident analysis, anthropometric and biomechanical analyses and field studies, survey techniques, and usability analysis. Although comprehensive in the range of topics covered, the chapter often lacks depth in key areas. The section on workload analysis is too brief to be useful, and there is virtually no mention of methods for measuring situational awareness. These topics should have a more visible place in any reference text on HSI or human factors engineering. In general, the chapter provides only a descriptive presentation of tools and methods rather than a more useful critical assessment of them.

Chapter 14 covers systems safety techniques and methods and includes a reference table that provides a comprehensive summary of over 100 analytical techniques. Several of the most commonly used techniques are covered in more detail in the text following the table. Chapter 15 is an excellent reference on environmental health hazard analysis and assessment. This chapter provides enough technical detail to be useful to the practicing systems engineer without being too theoretical. Chapter 16 presents the personnel survivability methodology primarily as it relates to military systems, but it briefly addresses issues concerning civilians working in hostile environments. Chapter 17 presents cost-benefit frameworks for HSI and effectively lays out the tools needed to make the business case for HSI. However, the chapter is narrow in focus and fails to address how to measure organizational performance within the HSI framework. It also misses the opportunity to relate how tools used to measure outcomes of other organizational models (CQI, TQM, etc.) could be used in HSI.

Part IV (Chapters 18-24) presents applications of HSI in various domains, including military, aviation, and new product development. Overall these chapters serve the *Handbook* well in bringing together the theories, models, and methods presented in Parts I-III. The historical examples are valuable because they are real-world examples that shed insight into the challenges and benefits of applying HSI in organizations with widely varying cultures and climates. Only Chapter 19 seems out of place in this section—it should either be incorporated into Chapter 13 or be placed directly after it.

The Afterword effectively uses examples in healthcare, education, and national security to discuss the implications of integrating HSI into systems engineering. Overall, the *Handbook* is as an informative reference for organizational leaders, human factors engineers, and systems engineers. However, the text would benefit from an early chapter summarizing the literature on high reliability organizations, human and organizational error, complex work environments, and high-risk systems (Authors: Reason, Perrow, Rasmussen, Weick, Sagan, Rochlin, etc.). Although much can be learned from the U.S. Army's MANPRINT program, readers would benefit from broader coverage of other interpretations and implementations of the HSI approach. The *Handbook's* bias toward defense applications detracts from its appeal and relevance as a general reference book.

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Virtual Reality Technology, 2nd Edition

by Grigore Burdea and Philippe Coiffet, John Wiley & Sons, 2003. ISBN: 0-471-36089-9, xvi + 444 pages. US$115.

This is an interesting book. My initial impression was to look at the text to see what might apply to Biomedical Engineering, and I was pleased to see good coverage of this material in the last two chapters [traditional and emerging virtual reality (VR)]. I was hoping to evaluate the text as a teaching/learning tool, but there are some problems here. If one already knows how to program using a virtual reality modeling language (VRML), the text and associated CD look excellent as a resource. However, it would be exceedingly difficult for one to pick this text up and learn VRML from it.

The text coverage is very good and well structured—each chapter contains chapter review questions, most chapters have relevant (some excellent!) video clips on the associated CD, and chapter references are extensive and up to date. After a brief introduction (Chapter 1), input devices and output devices associated with current VRML techniques are covered. Current computing architecture (Chapter 4) and modeling techniques (Chapter 5) are well covered. Chapter 6 reviewed VR programming, and it was interesting enough to move this author to download a VRML viewer from the Web and view several freely available movies. Chapter 7 gives brief coverage to human factors, an area that may be complemented by proper use of VRML. As mentioned above, the final two chapters review traditional and emerging VR applications.

The associated CD also contains a Lab Book, which consists of a 121-page manual, which includes some six major chapters, with a mixture of homework and project exercises. It appears that specialized hardware (Stereo Eyes and Data Gloves) is necessary for some of these exercises; a required lab equipment list is included.

As a novice, I feel that the CD Lab Book material would be better included within the physical text (as well as on the CD); integrating this material with the text material would have helped me make more sense of the text as I read through it. An instructor who has once or more taught this material, I will find the totality of this text and CD material a good and adequate resource.

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