certainly purchase the text. For practitioners and those academics wanting to get into the field, the book is well worth the money.

The integration of expert systems into mainstream software by Alan C Gillies, Chapman and Hall, London, 1991, pp 246, £19.95.

Reviewed by: Professor R Rada, Department of Computer Science, The University of Liverpool, Liverpool, UK.

This book fills an empty niche in the marketplace. The author notes that he is targeting upper level students in software engineering curricula and software engineers at companies. This seems a reasonable target for the material. Many universities around the world now offer courses on expert systems, and when the course is to emphasize the practical, engineering aspects of building expert systems this book would be helpful.

There are many older books in the area which are well-respected, such as *Building Expert Systems* edited by Hayes-Roth, Waterman and Lenat from 1983, and *Programming Expert Systems in OPS5* by Brownston, *et al.* from 1985. Books appeared in 1990 like *Introduction to Expert Systems* by Peter Jackson, and *Knowledge Systems and IBM Prolog* by Walker, *et al.*, but Gillie's book targets a more specific niche than these 1990 books, and is obviously more recent than the 1983 and 1985 books.

The early chapters of the book address various basic principles, such as the human-computer interface and the assessment of quality. The section on interfaces notes some interesting concepts about the relationship between the normal human–computer interface issues and what are more appropriate decompositions of the problem for expert systems work. My negative comment is that some chunks from these sections on principles could come from a book on another topic as they are not always closely integrated to the specific topic of expert systems.

The book contains three case studies, each occupying its own chapter. The topics are: using the joint knowledge-based system approach to combine human, algorithmic, and knowledge-based approaches to a pattern analysis problem, building an American military decision aid according to classic software engineering rules, and diagnosing tax problems with a system written in Prolog and integrated via C with the relational database management system INGRES. These case studies show the application of the principles described earlier and are crucial to the book's success.

About the style, my positive comments include that the writing style is conducive to relaxed, entertaining reading, and the illustrations are plentiful and helpful. There is a good mix of sentence lengths and use of metaphor. Nevertheless, there are a few places where the jump between a low-level and a high-level explanation seems too large.

The currentness of the topic is complemented by the constructive nature of it. I agree 100% with the author of the book that the major challenge to expert systems is to integrate them successfully in the workplace. This requires both integrating expert systems with the social and psychological needs of people and integrating expert systems with the other computer systems which people use. This book should help those in the commercial audience who want guidelines on how to integrate expert systems into the workplace.

Knowledge-based approaches for structural design by D. Sriram, Computational Mechanics Pubs, USA, 1990, pp 159, £29.00.

Reviewed by: Bimal Kumar*, Design Computing Unit, University of Sydney, Sydney NSW 2006, Australia (*On leave from Department of Civil Engineering, Strathclyde University, Glasgow, UK).

Around the early 1980s there was a sudden upsurge of activity in applications of artificial intelligence (AI) tools and techniques to just about anything. Structural engineers obviously did not want to be left behind, and numerous projects were started in different parts of the world on applying AI techniques to structural engineering. One of the first persons to recognize the

applications in structural engineering was Professor Steven Fenves of Carnegie-Mellon University. This book is a reproduction of one of the first doctoral projects carried out under his supervision. As this book is a reproduction of the author's doctoral dissertation, it forms quite a technical text. The target readership of the book could probably be researchers in AI applications to structural design.

The most important contribution of the work described in the book is a knowledge-based integrated model for structural design. The book also contains a detailed description of a prototype knowledge-based system for the preliminary design of buildings. This prototype is essentially an extension of an earlier doctoral done in the same department (Maher, 1984). The heart of the work presented in the book has to be chapters three and four, which describe the author's own research work. The rest of the book is either standard AI material or comparisons of DESTINY with other related systems. Chapter two is a description of important problem-solving and other techniques from AI, more detailed and involved treatment of which can be found in any standard text on AI. Chapter three is the most important chapter as it presents an integrated model for structural design, DESTINY and forms quite interesting and readable material on AI applications, or more appropriately knowledge-based applications, to structural design. Chapter four is a detailed description of the implementation of one of the knowledge modules of DESTINY responsible for the preliminary design of buildings, ALL-RISE. This chapter is extremely technical, and many readers may find it a little dreary. In fact, this chapter is only a description of the implementation of a small part of the DESTINY model and thus is not as important as the model itself described in the previous chapter three. Chapter five compares DESTINY to other related systems, and forms quite enjoyable reading. Finally, like any other doctoral dissertation, chapter six is a summary of the whole work as well as suggestions for further extensions.

In my opinion, this book should form a valuable reference for researchers in AI applications to structural design. The importance of the book derives from the fact that it presents one of the pioneering works in the field. The fact that similar systems to DESTINY do not still exist on the commercial scene, even after more than half a decade of this work being done, should not be seen as a handicap of research works in the field and hence books like these should not be rejected because of that. After all, research does not (and should not) guarantee a "finished product" at the end of the day. Research should extend the frontiers of knowledge more than anything else. To those readers who reject works like the one presented in this book on the aforementioned precarious grounds, I can only urge them to see the results of research as education. When are we going to see education as an end in itself?

References

Maher, ML, 1984, *HI-RISE: An Expert System for the Preliminary Structural Design of High Rise Buildings* PhD Thesis, Department of Civil Engineering, Carnegie-Mellon University, Pittsburgh, USA.