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Book Reviews

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The visual display of quantitative information reviewed by Darren van Laar, Management School, Imperial College of Science and Technology, London SW7.
Crafting knowledge based systems reviewed by Brian Jones, Department of Business Information Systems, Slough College of Higher Education, Slough, Berkshire SL1 1YG.
Knowledge engineering for expert systems reviewed by Ian Neale, City University Business School, London EC1V 0HB.
Knowledge engineering reviewed by Ian Neale, City University Business School, London EC1V 0HB.
What every engineer should know about artificial intelligence reviewed by Paul Chung, Artificial Intelligence Applications Institute, University of Edinburgh, Edinburgh EH1 1HN.
Artificial intelligence and expert systems—case studies in the knowledge domain of archaeology reviewed by Dr Jim Doran, Department of Computer Science, Essex University, Colchester CO4 3SQ.
Artificial intelligence—a handbook of professionalism reviewed by Richard Ennals, Coordinator of College Central Support Service, Kingston College of Further Education, Kingston, Surrey KT1 2AQ.
Expert systems in law reviewed by Richard Ennals, Coordinator of College Central Support Service, Kingston College of Further Education, Kingston, Surrey KT1 2AQ.

Expert systems for experts by Kamran Parsaye and Mark Chignell, John Wiley & Sons, Inc., 1988, pp 462, £18.95, ISBN 0-471-60175-6.

Since the beginning of Computer Science, many researchers have been tempted by the idea of simulating and duplicating human abilities using a computer. A computer, after all, is a device that parallels the human ability to perform calculations. However, the real temptation was to produce a machine that simulates all of human abilities. The ideal was to produce an intelligent machine that could cope with every situation the way a human does.

Soon, researchers found that the task of producing an intelligent machine was much, much bigger than they had initially thought. The computer resources and theory needed were far beyond their reach (and it still is). However, they found that applying some of their ideas to a very restricted domain, some of the so-called human abilities could be duplicated. An expert system (or knowledge-based system) is a computer program that performs a task within a very narrow area of expertise, duplicating to a certain extent the abilities of a human expert in that area.

Expert systems have generated a great deal of interest. Since the first simple expert system, many more complex systems have been developed. Expert systems have since developed in two directions. The first is the application of expert system technology to a wider and wider class of problems. The second is the formalization of reasoning and knowledge representation which could be applied to a problem area. The knowledge and experience gained in these two interwoven developments have led to the development of expert shells. That is, expert systems with a reasoning mechanism, sometimes several, and some knowledge representation scheme, but no domain knowledge (data).

Since the first expert system appeared, there have been many technical publications in the area. Most of which were technical papers describing specific examples. In the early eighties many

companies noticed the potential of such systems and many other applications were produced. Since the mid-eighties there has been a boom of publications in the area of expert and knowledge-based systems, ranging from the most technical collection of papers, to the most general user oriented that claimed that you could write an expert system in your favourite microcomputer programming language. However, there have been few books that could explain to the non initiated public all the ideas, concepts and methods used to build an expert system.

When building an expert system there are at least two experts interacting, the knowledge engineer and the expert in the specific domain. The knowledge engineer will help the domain expert to clarify and formalize his knowledge in such a way that it can be fed into a computer. Initially, both will be ignorant of the other's domain, so a great amount of time is spent training each other. This book aims to instruct the human expert, so the time spent in the initial phase of development of a expert system is reduced. Moreover, as more and better expert systems development tools appear in the market, it should be possible for an expert to use the tool directly and produce the expert system without the help of a knowledge engineer.

This book will help those human experts who need to augment their knowledge of expert systems, but who do not necessarily know anything about computer science. It will also help those people, non experts, who want to have a good idea of what an expert system is and all the tools needed to build one.

The book is organized in nine chapters and four appendices. The appendices are used to give the reader a background of some concepts needed for a better understanding of the book. There are appendices for each methods, general-purpose reasoning, propositional logic and relational databases.

Within the chapters, the reader receives a good background on expert systems, and introductions to logic, knowledge, knowledge representation using frames, uncertainty, inference and, finally, some issues on building expert systems and knowledge acquisition. It also provides a very large bibliography (around 650 references). A good number of figures and examples help our understanding of the many different concepts introduced. However, just because of the large amount of new information, some people may feel overwhelmed by the jargon.

I would recommend the book to anybody that needs a good introduction to expert system concepts and methodology.

The visual display of quantitative information by E. R. Tufte, Graphic Press UK, 1988, pp 197, £20.

The correct and aesthetic display of information in graphs and diagrams is a skill required by researchers in all fields. Unfortunately obtaining this skill is often a case of trial and error or complaint and compliment learning, with people rarely being explicitly taught how to produce good data graphics.

This book sets out clearly, with many illustrative and amusing examples, a theory of data graphics and principles for graphical excellence. Tufte has put his many years of experience and research—he was a consultant in the design of IBM's Presentation Manager interface—into this highly useful and entertaining book. The result is a wonderful collection of both good and bad data graphics from the earliest Playfair histogram to the latest computer generated maps.

The first part of the book concentrates on providing examples of good graphical design, from a tenth century time series plot, to what Tufte regards as possibly the best realization of data in graphical form ever: CJ Minard's illustration of Napoleon's Russian campaign.

The next section is devoted to "graphical integrity", and has many examples of misleading graphical representations from a wide variety of ostensibly responsible publications. One illustration from Time magazine uses increasing barrel size to represent rising oil prices over time, with an actual price rise of 454% being depicted by a barrel whose volume increases by 4,280%—a "lie factor" of 9.4. Tufte points out ways to avoid being taken in by, and producing, misleading diagrams and