

are covered in the "Image understanding" article. The article "Literature, AI" says nothing about the vision literature (except for an incidental mention under "Cognitive sciences" (!) on p. 532).

In short, the vision articles in the Encyclopedia are generally quite good, but their authors were constrained by a list of topics that they didn't create, and the overall organization leaves much to be desired. I hope the coverage of the other parts of AI is better organized.

BUILDING EXPERT SYSTEMS: COGNITIVE EMULATION

Philip E. Slatter

Ellis Horwood Limited

ISBN: 0-7458-0065-3, \$39.00

Reviewed by: Chris Westphal

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Building Expert Systems: Cognitive Emulation provides a good thorough overview of cognitive emulation and its relation to knowledge engineering techniques. Cognitive emulation as defined by Slatter refers to *the strategy of expert system design that attempts to emulate human thinking*. Although cognitive emulation appears to be inherent in knowledge engineering, it provides expert system practitioners with additional mechanisms to acquire and integrate the representation of knowledge constructs with the reasoning strategies employed by domain experts to effectively achieve a reliable system. The book assumes no prior exposure to cognitive psychology and therefore is not overloaded with jargon.

As stated in the introductory chapter, this book is *extremely* rich in references (200 + bibliography), which allows the reader to actively pursue additional topics of related interest; the reader should be prepared for some difficulty in gaining access to many of the citations of European origin. The variety of expert system topics (e.g. knowledge representation, multiple experts, uncertainty, etc.) and their relations to cognitive emulation are supported by simple examples that define and clarify areas of discussion. These examples try to support opposing viewpoints where appropriate. Although the depth of the material for these areas is relatively shallow, Slatter does a good job at relating them to previously distinguished topics (breadth) as may be seen throughout the book and chapter summaries.

Breadth is the strong point of the book. Although many of the topics discussed are standard aspects of knowledge engineering, there are additional sections that cover more remote concepts, such as behavioral mimicry, tutoring, and novices vs. experts. There is even a section discussing cognitive emulation and neural processing. These selected discussions of human cognition are provided at the conceptual level, rather than the implementation level, which may account for the somewhat limited overview of how current systems incorporate the proposed principles.

There were editorial shortcomings of the book. Specifically, numerous typographical errors and an over-generalized table of contents. Furthermore, chapter 4 made references to non-existent text.

Overall, I give this book a favorable review. As an introductory text to cognitive emulation, the book meets all of its stated objectives (p. 12-13). Aspiring knowledge en-

gineers should find this text a good reference for their libraries.

Automated Reasoning: 33 Basic Research Problems

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Prentice Hall 1988

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This book covers a basic overview of the automation of reasoning, test problems and as the title says 33 basic problems relating to research in automated reasoning. It gave clear examples of problems and obstacles. The intended audience of the book is the new researcher, someone looking for a direction as to how to proceed in the area of automation of reasoning.

Chapter one starts the book out with an overview of the book and automatic reasoning programs. Not only does the author point you to a Journal, he also supplies sources for programs and a plug for another of his books. The author has a companion book, "Automated Reasoning: Introduction and Application" also published by Prentice Hall. I haven't seen this book; but if this one is any indication of the type of work done by this author, I will be looking for it. The author does state that the difficulty of solving these problems is equal in difficulty to a Ph.D. thesis. I have to agree that most of the problems are very difficult.

Chapter two attempt to focus the researcher to particular problems and to limit the attempt to solve all the world's problems with one program.

Chapter three lists each research problem giving a short description of the problems. The problems are grouped into the categories of Strategy, Inference Rules, Demodulation, Subsumption, Knowledge Representation, Logic Programming, Self Analysis, and others. This chapter is kind of a preview of the problems used to setup the next chapter.

Chapter four gives a good review of the basic elements of Automated Reasoning with some examples. This chapter is the kind of text that really is of use to someone like myself who is a relative novice in this area. This chapter gives the reader a good start with plenty of references to continue their education.

Chapter five goes into the 33 research problems in more detail than chapter three. Each problem is given about a page to describe the details more fully.

Chapter six discusses ways to test your solutions to the problems and methods of developing experiments. This chapter gives you some test cases to try again your efforts.

In general, I liked the author's method of presenting the material. I would have liked to see a little more variety in the level of difficulty of the problems. This book points a researcher to other sources of information to go with the problems. I would recommend this text to anyone looking for research problems.