

that their dependency was useful to them in terms of intellectual development, job prospects, self-confidence and self-esteem etc. Their partners however generally saw the dependency as having negative effects, particularly on social relationships.

Shotton suggests that the results from her study reveal that although computer dependency does occur for a small proportion of computer users, its impact on those people is not as negative or as serious as popular images would suggest. Excessive computer use does not turn sociable individuals into recluses. Rather those that become dependent are those that would be socially isolated anyway. Computer dependents do not differ significantly from other types of hobbyists or enthusiasts and in most cases are merely creating their own personal challenges and excitements through computer use. Within the conclusions, computer dependency is firmly located within the context of everyday living in the 1990s where the philosophies of self-need and individuality are cultivated at the expense of the group.

As a result of comprehensive empirical research Margaret Shotton has succeeded in describing, analyzing and understanding the world of the computer dependent without resorting to stereotypical images or popular representations. Their worlds, their personalities and their relationships are treated sensitively and perceptively. The result makes extremely interesting reading which would be of particular use to those researchers and academics concerned with the more social-psychological aspects of human-computer interaction. As well as being an excellent example of the right way to do psychological research, the book provides a fascinating insight into a group of individuals for whom interaction with computers is considered preferable to the majority of their interactions with people.

References

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 Turkle, S, 1984. *The second self: Computers and the human spirit*, London: Granada.

AI and expertise: heuristic search, inference, automatic proving by H Farreny, 1988, translated by Jonathan Barchan, Ellis Horwood, pp 260, £39.95.

This is a translation of the original French edition, "Exercices programmes d'intelligence artificielle" (Masson Editeur, Paris, 1987). The two titles plus the beginning of the introduction give an accurate flavour of the book: "In many training courses the participants are asked to complete 'projects', which consist of implementing and testing basic methods, or variants, for solving actual problems. . . . This book is designed to extend a foundation course in: (i) heuristic problem-solving using state spaces, (ii) expert systems generators, (iii) automatic theorem proving. . . . The book is divided into three large chapters corresponding to these themes."

The structure of the book is to review a topic, and then give code for implementing algorithms of increasing complexity. The initial algorithms are given in a simple procedural notation, and the implementations in Lisp (Le-Lisp 15.2). The programs use, in the main, primitives which are common to most Lisp dialects, and have been tested on an Apple Macintosh Plus micro with a megabyte of main memory. However the code and usage sessions presented in the book were entered by hand during translation from the French version—which itself does not seem to have been produced electronically from the source code. Nevertheless, this has been done with care; the quality of the code reproduction appears high, and the translation reads very well.

The first chapter reviews the A and A* algorithms and variants; hardly gripping stuff to start with, but leading to solutions to the 8-puzzle and the travelling salesperson problem.

The second chapter starts by developing an EMYCIN-style inference engine using uncertain knowledge which allows questions and revisions of replies during a session. Next a planning-type expert system generator is developed which is nonmonotonic, uses mixing chaining, works depth first according to a tentative regime with control over the depth, and searches for all solutions

within the first depth. Neither of these engines allows variables in the rules or facts. This omission is redressed by a discussion of one of the pattern matching mechanisms in Argos-II.

The discussion of automatic proving constructs, in five stages, a Prolog-type prover with a depth-first linear input strategy, which searches for and displays all proofs. Predefined predicates are included: there is a detailed description of the implementation of the cut, and of evaluable functions. This chapter finishes with the construction of another prover, still based on Horn clauses but different from Prolog. It uses a breadth-first positive unit strategy, the final version of which eliminates subsumed unit clauses.

This is more a book to study than to read, although the general reader will find it interesting to dip into; the structure of the book, with several different topics, invites this. The claim that an elementary knowledge of Lisp will suffice to tackle the book seems justified, and reading code which implements interesting mechanisms/strategies is an enjoyable way to improve one's knowledge both of the language and of the functions described.

Artificial intelligence expert systems and languages in modelling and simulation—Proceedings of the 1st IMACS Symposium on Artificial Intelligence 1987, eds. Casimir A. Kulikowski, Rafael M. Huber and Gabriel A. Ferrate 1987, ISBN 0-444-70482-5, pp 374, \$97.74.

This book contains the papers presented at the first conference of the International Association for Mathematics and Computers in Simulation. The papers refer to work carried out prior to mid-1987 and, as such, are now a little dated. At a cost of over \$90 this is an expensive book, and cannot be recommended for individual purchase. In what follows I hope to say something about its contents that will help the reader decide whether there are any papers in these proceedings worth looking at. My guess is that for some readers there may be a few papers of interest if they are working in a very specialized area that is also being investigated by some of the authors of these papers and they want to see how others are tackling or planning to tackle similar problems. However, if the reader is looking for helpful hints as to how to solve practical problems in detail then he or she will be disappointed. If you are writing a review of the uses of AI in modelling and simulation then you should certainly scan through these papers. As is, unfortunately, common with many conference proceedings which rely on camera ready copy the quality of presentation varies from good to awful.

The book starts with a survey article by Kulikowski which covers most of the standard aspects of the evolution of AI, modelling, and simulations techniques now in use and the relationships between them. It is followed by a series of papers describing various environments for combining AI and simulation. These include the various standard approaches using Prolog, Lisp, Object Oriented programming languages, distributed and parallel computing environments and associated graphics interfaces. Disappointingly no substantial applications developed using these approaches are described, neither is there any information as to the availability of some of the environments or methodologies described, nor is there any discussion of their relative strengths and weaknesses. I could not help feeling that many of these papers were little more than extended abstracts. A major grumble is that many of the authors spend a lot of time extolling the virtues of their particular dialect of Prolog or Lisp or their particular enhancement or extension. I would dearly have liked to see some well documented heuristics or fragments of algorithm. Nowhere was this more frustrating than in those papers where symbolic and numerical techniques were combined. Often I was left at the end of the paper feeling "high and dry". After my appetite had been whetted by some promising introduction it eventually transpired that the paper was describing yet another piece of "preliminary design" or those very questions I was expecting answers to were "topics to be investigated further".

What I did get from this book, however, was an appreciation of the sheer number and modelling point of view. There were papers describing attempts to tackle problems in such diverse areas as forestry, transportation, computer integrated manufacturing, CAD, the modelling of ecosystems, planning haemo-dialysis treatment for patients with kidney disease and modelling of offshore escape and evacuation procedures. I hope that those attending the conference benefitted by getting