Chapter 5 is an introduction to the main approaches to machine learning, which is an excellent review of this particular field. It covers a wide range of issues and techniques from general architecture of learning systems, inference rules used, to different learning strategies. It is one of the few chapters in the book that just assume a general knowledge of AI to understand the contents.

Chapter 6 addresses the definition of a formal language for requirements engineering of software systems. After articulating the activity of requirements engineering and its role within the software development lifecycle, the author primarily systematically reconstructed a language which incorporates various logics such as temporal logic, multi-sorted logic, logic of partial functions, etc.

Chapter 7 deals with the extension of Montague's semantics. This chapter heavily depends on the material described in the first two volumes, although it includes a brief overview of the basic concepts and limitations of Montague's intensional logic. The purpose of this chapter is to show how these limitations can be overcome by the translation of the alternative formalisms such as the theory of discourse and boolean semantics, into the language of intensional logic. The power of this enriched logic is exhibited by its application to natural language representation. The chapter concludes with a discussion of the flexible Montague grammar and its extension.

Chapter 8 is devoted to proof verification in type-theoretic languages. It discusses type-theoretical logic of higher order, and shows how this powerful language can tackle the tasks which would be difficult to handle by directly using first order logic. A particular system called Automath for proof checking of constructive type theory is described in detail. Towards the end of the chapter, tactics are introduced as a way to enhance the performance of the systems.

In general, the book met its original motive and showed several uses of logic in different areas of artificial intelligence. Many concrete applications have been presented and analysed. The book is well edited, and forms an integral part to the previous two volumes. Each chapter contains a good bibliography. However, it is doubtful whether someone without familiarity with the application domains would be able to make sense of the details of the specialized discussions. Certainly, the book does not provide an easy way of becoming familiar with the issues in each of the fields convered. The editor and indeed the authors did make an effort to link the diverse applications together, and a foreword is included to summarize each chapter and the possible links between them. However, the connection between them is weak, which I think is due to the nature of such a book.

All in all the book would seem to be of interest to those with a particular involvement in one of the areas covered, rather than a way to learn from practical applications in these fields. It is doubtful that any reader could find that all the material in the book is useful.

Reviewed by Zhan Cui, Imperial Cancer Research Fund, London WC2A 3PX, UK

Artificial intelligence from A to Z by Jenny Raggett and William Bains, Chapman & Hall, UK, 1992, pp 246, £11.95, ISBN 0-412-37950-3.

This book must have seemed like a great idea when it was first proposed. I can just imagine a sharp-suited someone with an eye on their profit margin announcing "Let's provide a 'Bluff your way in AI' guide for all those harassed middle managers who've heard about the subject but are far too overworked to read a serious textbook, it'll be a bestseller", and then deciding upon a glossary of AI topics, each being explained in jargon-free terms. It sounds like a good idea, and in fact the book almost lives up to its back cover billing of *entries . . . which are extensive and discursive, . . . written in a clear, informal manner*. Except that many of the entries are riddled with errors, and not even the cute icons with which the book is littered, or the folksy hand-drawn diagrams, or even the large friendly letters with which the entries are titled, can make up for the inaccuracies.

These inaccuracies range from the complete fabrication of some terms to sloppy referencing in others. For example, the authors define something called "Bayesian Logic" (page 24), which just does not exist—what they describe is a confused version of Bayes theorem, which in reality has very

little to do with logic. The section on "Expert Systems" (page 77) is similarly flawed. The system XCON/R1 was used to configure systems in the manufacturing plant, not help salesmen (that was XSEL). It was Edward Shortliffe who developed MYCIN, not Edward Shortcliff, and it is the Dempster–Shafer theory, not the Dempsey–Shafer theory. Further errors are obvious in the definition of "Genetic algorithm" (page 94), which is almost entirely misleading (and genetic algorithms certainly don't belong in the category "Theory/Philosophy") and that of "Monotonic Reasoning" (page 138) which completely misses the point about non-monotonic reasoning. This is not that contradictions are tolerated (they aren't in most systems), but that contradictions are prevented by withdrawing old incorrect conclusions when new information is added to the database (it is the fact that conclusions cannot be withdrawn that makes classical logic monotonic). Even when the basic ideas are correct, the authors are extremely slapdash in putting the entries together, as the entry for "Meta Rule" (page 134) clearly shows—the example simply does not make sense.

To be fair to the authors, it is extremely difficult to provide anything like a comprehensive overview of artificial intelligence in a single book, especially a slim volume such as this. Even some AI textbooks, written by people with long involvement in the field, occasionally contain factual errors in the description of subfields with which the authors are unfamiliar, and it must be almost impossible for people coming from outside the field to grasp any part of it quickly. Thus it is completely understandable that this book should include as many facts as it does that are just plain wrong. However, just because it is very difficult to write a book such as this well, it is not excusable to write it badly, or to fill it full of incorrect information.

So, if you want to learn about AI, go out and buy one of the many introductory textbooks, several of which are just as clear and informal (for the most part) as *Artificial Intelligence from A to Z*, and which have the definite advantage of being correct.

Reviewed by Simon Parsons, Advanced Computation Laboratory, Imperial Cancer Research Fund, PO Box 123, Lincoln's Inn Fields WC2A 3PX, UK

Intelligent decision support—handbook of applications and advances of the rough sets theory edited by Roman Słowiński, Kluwer Academic, The Netherlands, 1992, pp 471, £88.00, ISBN 0-792-31923-0.

The first thing to note about this book is that the title is partly misleading since the book says little about intelligent decision support. However, as the second part of the title suggests, it has a lot to say about rough sets, being a collection of papers on the subject. Rough sets, as the book seems to mention every other page, were introduced by Pawlak in 1984 as a means of extracting "decision rules" of the form "if a car is small and has a large engine then it is fast" from a mass of data about the size and speed of a car and the size of its engine. They have been quite widely adopted, forming the basis of a number of systems of machine learning and inexact reasoning, and any new work on them is automatically of interest. Unfortunately, this collection of papers, many of which are interesting in their own right, give the impression of having been thrown together rather randomly (perhaps because they have no more connection than having been presented at the same conference), and so, despite the editor's best efforts, sit rather uneasily together. As a result, it is difficult to see who is going to shell out £88.00 for the priviledge of having a copy of this book on their bookshelf. Even I, a confirmed advocate of the use of rough sets, would think twice about it. This is a shame, because in a more attractive (and cheaper) format the book might well go further, and give the idea of rough sets some well deserved publicity.

The book opens with a section of 13 papers on applications of rough sets to a wide range of problems from the control of a rotary clinker kiln to the prediction of earthquakes in Belgium, taking in on the way, the analysis of voting in the 1988 US Presidential election, and that favourite chestnut of the rough set community, the prediction of the prognosis for patients having undergone a highly selective vagotomy. All of these are fine descriptions of applications, except that none of them actually explain what a rough set is, so one has to read to page 205 to find a definition—the