considered as an extension of Martin Löf's theory with universes by an (impredicative) type of logical propositions. Such philosophical discussion, together with the fact that the ECC is quite a complex type theory and that many of the proofs (of meta-theoretic results) are quite involved, means that this is not a book for the beginner. However, for someone with background knowledge of type theory I recommend *Computation and Reasoning* wholeheartedly.

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IAN PRATT
Artificial Intelligence. Macmillan. 1994. ISBN 0-333-59755-9. £16.99. 280 pp. softbound.

There is a continuing and sometimes heated debate in Artificial Intelligence (AI) between the formalists and experimentalists, often characterized as 'neats' versus 'scruffies'. The former argue for the centrality of logic in AI and its use as a base for further research, while the latter claim that effort is better spent on content rather than form, and that logic can obscure and hinder research. Pratt's book lies in the formalist camp, but while it does indeed give a thorough grounding in the underlying theory of many aspects of AI and concentrate on those aspects that lend themselves to such analyses, it also highlights some of the inherent limitations.

The book can be considered in two parts. The first begins with an introductory chapter which sets the scene by stating that the subject of the book is that part of AI that is the 'enterprise of programming computers to make inferences'. It also describes a couple of motivating examples used subsequently to illustrate various techniques, and characterizes inference as involving *belief* and *heuristics*, key ideas which are further explored throughout the book.

The remainder of the first part includes five other chapters which cover search and planning, logic and inference, closed world assumptions, defeasible inference, and reason maintenance. The thread linking the topics of these chapters is developed coherently and convincingly from the initial example in the introduction concerning a robot moving around a house. Chapter 2 expands on the example by introducing technical details necessary for a fuller account of search and planning. Chapter 3 shows how logic can be used to formalize the previous discussion of planning, and in so doing explores the frame problem and possible solutions to it with alternatives to logic. The next two chapters then develop this further by considering topics in defeasible reasoning including circumscription, inheritance hierarchies and default logic. Finally, the first part ends with a chapter detailing aspects of truth maintenance.

By contrast, a second part of the book is much less cohesive. That this is so is less a criticism of the second part than an appreciation of the first. Here the chapters address such diverse topics as memory organization, probabilistic inference, induction and neural networks. In the preface, the author acknowledges the distinction between these two parts as core chapters and independent chapters, and balances the selectivity of material against the depth of those topics covered.

Much of the material in the book is quite demanding, and despite the appendix providing a tutorial introduction to predicate calculus, the claim made on the back cover that the book gives a 'clear and readable' introduction while 'assuming no prior knowledge of AI or logic' is perhaps a little optimistic. It is certainly well written, but covers the material to a greater depth than is usual in introductory texts and does so very quickly. Those without at least some prior knowledge may easily be intimidated.

Throughout the book, each chapter ends with a set of exercises including programming problems and suggestions for further reading. The suggestions are limited, however, and given that the material is treated in depth, it would have been worthwhile to have included a more extensive bibliography.

Overall, Pratt's book is an ambitious effort at a general AI text which covers its material in detail. It is largely successful and will certainly appeal to those who share Pratt's logical approach.

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MARTIN SHEPPERD AND DARREL INCE
Derivation and Validation of Software Metrics. Oxford Science Publications. 1993. ISBN 0-19-853842-1. £30.00. 167 pp. hardbound.

In the words of the authors, software metrics is *the application of quantitative methods to software engineering*. In fact, while quantitative methods lie at the heart of traditional engineering disciplines, until 3 years ago software metrics was widely viewed as a peripheral subject within software engineering. There were less than a handful of books which covered any aspect of the subject in any depth at all. However, things are changing rapidly. If we judge the importance of a subject by the volume of books produced, then software metrics must now have truly arrived into the mainstream of software engineering. At least 30 books on software metrics have been published in the last three years. There have been a number of high-profile ESPRIT technology transfer projects and a mushrooming of conferences; it appears that metrics is a boom area.

So the question is: given this explosion of very recent activity, does this book offer anything substantially different? I believe it does, although inevitably some of the ground is covered elsewhere. This book concentrates on metrics which can be determined *early* in the software development life-cycle; specifically metrics that can be computed from designs and specifications. The authors