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Book reviews

LOGIC Programming: expanding the horizons reviewed by Paul Krause, Imperial Cancer Research Fund, London, WC2A 3PX.
Uncertainty and vagueness in knowledge based systems reviewed by: Paul Krause, Imperial Cancer Research Fund, London WC2A 3PX.
A beginner's book of TEX reviewed by: Ali Rahmanzadeh, Imperial Cancer Research Fund, London WC2A 3PX.

LOGIC Programming: expanding the horizons by Tony Dodd, Richard Owens and Steve Torrance (Eds), Intellect Books, Oxford, 1991, pp 208, £29.95, ISBN 1-871516-15-03.

Even in this age of electronic publishing, it still seems to take an inordinate amount of time for some conference proceedings and scientific papers to be published. This is a collection of papers from a workshop held at Imperial College in February of 1989. This book was not published until 1991; although I suppose I have no grounds to criticize, given the time it has taken me to complete this review. Late as it is, this book is in a small way an historic document. It records what was the last activity of the Alvey logic programming club, and (retrospectively) the first of the UK Logic Programming Conferences organized by the Association for Logic Programming.

I find it a little difficult to understand the rationale behind the precise choice of the papers which have been included in this book. Of the 20 or so presentations at the workshop, only seven have been included. That is not meant as a criticism of the papers which are in the book. But we were treated to invited talks by many of the key figures in logic programming in Britain and Europe during the two days of the meeting, and yet of those, only Dov Gabbay has a paper in this book (and even then, Gabbay's paper on Temporal Logic Programming does not quite cover the same ground as his talk on meta-level logic at the workshop). It would have been worth recording the collected wisdom of Bob Kowalski, John Lloyd, David Warren, Hervé Gallaire *et al* at least in some form of extended abstracts were it possible. However, they are busy people and I expect it is difficult to elicit written words from them.

What *is* in the book? We have an extensive treatment of the *Pure Logic Language* (PLL) by Ed Babb of ICL. This is a logical rewrite language with classical negation. The version discussed in the book incorporates some constraint handling technology derived from work at ECRC and ICL to give PLL some of the properties of a constraint logic language. PLL has a very flexible problem solving capability, and there are a large number of simple examples in this paper to demonstrate it in action. It rather looks as though that is its forte; a problem solving assistant and not so much a programming language. In fact, that is not at all surprising as the original intent was for PLL to be a database query language. Basically, the idea is that PLL will take a query expressed in first order logic and attempt to rewrite it in a form which is in some sense 'more concrete' than the original. So for example, the query $(x = y*2 - u) \wedge (y = z*2) \wedge (z = 2)$ would yield the response $(z = 2) \wedge (y = 4) \wedge (x = 8 - u)$.

More details of the actual implementation of PLL are contained in a paper by Peter McBrien of Imperial College. The main purpose of this paper is to describe the computational model of PLL, although there is some discussion of graph rewriting as a general purpose technique for executing logic languages. A claim is made that the technique of graph rewriting used is equally applicable, for example, as an implementation technique for Prolog. But the benchmarks given show that PLL is significantly slower than Prolog, so the comments on implementing Prolog by graph rewriting

seem to be more useful as an illustration of the technique rather than as a serious alternative for implementing Prolog. Nevertheless, the project as reported here was still in its youthful stages, and one would not expect issues of efficiency to have been aggressively addressed.

Tim Flannagan's '*PR: a logic for practical reasoning*' made it into the book. The motivation behind this work is to develop a logic for planning and for action, drawing heavily from Kenny's 'logic of satisfactoriness'. The latter seems to be a work aimed at the philosophical logic community. With the example

> I want to be in San Francisco by noon
> If I take the 11.30 train I will be in San Francisco by noon
> So I'll take the 11.30 train

Flannagan introduces the inference schema of 'co-modus ponens'. That is:

$$\frac{G, C \rightarrow G}{C}$$

This rather looks like abduction to me, in which case the properties of defeasibility do not seem at all surprising. Dov Gabbay among others has on occasion talked enthusiastically about the properties of abduction, and I suspect that what Tim Flannagan is trying to express could be expressed more clearly in these terms. But that is perhaps a statement of my prejudice against heavy philosophy.

Dov Gabbay's mischievously entertaining presentation style can belie the seriousness of what he has to say. The aforementioned paper by Gabbay included in this book is comprehensive and hard work. It is the second part of an extended study of modal and temporal logic programming, and does demand a much higher degree of mathematical sophistication to read than any of the other papers in the book. I think this is a pity, and suspect that the paper will go largely unread by most purchasers. A little more guidance through the paper for the uninitiated would have been useful. It is highly interesting and original work as you would expect. But in deference to the hard of understanding like myself, I rather think that this is the wrong place for this paper to have appeared in its raw form.

So what have we got left? The handling of incomplete information in a logical database is discussed by Kong and Williams; 'Virtual logical neurons' implemented in a concurrent logic language by Kozato and Ringwood; Kelpie, by Hamish Taylor, addresses the development of a concurrent logic programming system for large scale database applications. Referring back to my opening comments, the interfacing of logical languages to large databases is a particularly fast moving field of research at the moment, as is the development of concurrent logic languages themselves. One wonders a bit just how much these three papers reflect current technology?

This book does contain an interesting selection of papers, and they are all certainly worth reading. The main reason for a slight feeling of disappointment with it is its very limited coverage of the material which was actually presented in the workshop of February 1989. I think that in an ideal world I would like to have seen a slightly better balanced presentation of material, and a much broader coverage of the state of the art at the time. But it is worth a read all the same.

Uncertainty and vagueness in knowledge based systems by R Kruse, E Schwecke and J Heinsohn, Springer-Verlag, Berlin, £35.00. ISBN 3-540-54165-9.

When ECAI was held at Stockholm a couple of years ago, Mark Wallace of ECRC began his presentation with words to the effect: 'There seem to be two general approaches to giving short presentations at conferences like this. The first is that of the established figure who just gives one or two pointers and refers the audience to the literature for further information. The second is that of the enthusiastic young researcher who wants to tell the audience everything he or she has learnt.