

# The knowledge

VOLUME 3 NUMBER 4 DECEMBER 1988

engineering review

Cambridge University Press

# The knowledge engineering review

The British Computer Society Specialist Group on Expert Systems

## EDITOR

Dr John Fox, Imperial Cancer Research Fund, London

## EDITORIAL BOARD

Alain Bonnet	<i>Ecole Nationale, France</i>
Stefano Cerri	<i>Institute Mario Negri, Italy</i>
W. Clancey	<i>Stanford University, USA</i>
Paul Cohen	<i>University of Massachusetts, USA</i>
R. Davis	<i>Massachusetts Institute of Technology, USA</i>
Mark Drummond	<i>NASA Ames Research Center, USA</i>
Peter Friedland	<i>Stanford University, USA</i>
William Gale	<i>AT &amp; T Bell Laboratories, USA</i>
R. Harrington	<i>Software A &amp; E, UK</i>
Peter Hammond	<i>University of Birmingham, UK</i>
Peter Jackson	<i>McDonnell Douglas Research Labs, USA</i>
J. P. Laurent	<i>University of Savoy, France</i>
Sandra Marcus	<i>Boeing Computer Services, USA</i>
Elaine Rich	<i>Microelectronics and Computer Corporation, USA</i>
Bill Sharpe	<i>Hewlett Packard Labs, UK</i>
Luc Steels	<i>Free University of Brussels, Belgium</i>
Richard Susskind	<i>Ernst &amp; Whinney Ltd, UK</i>
Austin Tate	<i>University of Edinburgh AI Applications Institute, UK</i>

## The Knowledge Engineering Review: Publication Policy

The Knowledge Engineering Review has been established to provide a general source of information and analysis in all areas relevant to research and development in knowledge based systems and applied artificial intelligence. The editors wish to encourage careful preparation of original papers analysing developments in the field. In particular we wish to see tutorial and survey articles, and commentary, criticism and debate. Primary research papers on specialised technical topics are unlikely to be appropriate but research papers on broad topics, such as development methodology or general evaluations of tools and techniques, are of interest. Descriptions of specific projects or particular computer systems will be considered if their presentation draws out general issues in the design, implementation or impact of knowledge based systems.

© Cambridge University Press 1988

## Copying

This journal is registered with the Copyright Clearance Centre, 27 Congress St., Salem, Mass. 01970. Organisations in the USA are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per-copy fee of \$05.00. This consent does not extend to multiple copy for promotional or commercial purposes. Code 0269-8889/88 \$5.00+.00.

FOR ALL OTHER USE, permission should be sought from the Cambridge or New York offices of the Cambridge University Press.

THE KNOWLEDGE ENGINEERING REVIEW (ISSN 0269-8889) is published every three months in March, June, September and December. Four parts form a volume.

ORDERS, which must be accompanied by payment, should be sent to any bookseller or subscription agent, or direct to Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU. Subscriptions in the USA or Canada should be sent to Cambridge University Press, 32 East 57th Street, New York, NY 10022. The subscription price of volume 3, 1988 is £50.00 (US \$98.00 in the USA and Canada) for institutions; £30.00 (US\$49 in the USA and Canada) for individuals; including postage; separate parts cost £15.00 (US\$30.00 in the USA and Canada) plus postage. Second class postage paid at New York, NY, and at additional mailing offices. POSTMASTER: send address changes in USA and Canada to The Knowledge Engineering Review, Cambridge University Press, 110 Midland Avenue, Port Chester, New York, NY 10573.

CLAIMS for missing issues can only be considered if made immediately after receipt of the subsequent issue.

BACK VOLUMES: Volumes 1 and 2 are available from Cambridge University Press.

ADVERTISING: Details of advertising in The Knowledge Engineering Review may be obtained from the publisher.