

(AI EDAM)

ARTIFICIAL INTELLIGENCE FOR ENGINEERING DESIGN, ANALYSIS AND MANUFACTURING

Editor Clive L. Dym

VOLUME 3

ACADEMIC PRESS

Harcourt Brace Jovanovich, Publishers

London San Diego New York Boston
Sydney Tokyo Toronto

ISSN 0890-0604

Author Index

Abelson, H. see Cline, T.	195
Abrams, F. L. see LeClair, S. R.	125
Bartlett, R. see Becker, L. A.	23
Becker, L. A., Bartlett, R., Kinigadner, A. and Roy, M. Using manufacturing process representations	23
Books	137
Brown, D. C. see Carney, S. P.	85
Carney, S. P. and Brown, D. C. A continued investigation into qualitative reasoning about shape and fit	85
Cline, T., Abelson, H. and Harris, W. Symbolic computing in engineering design	195
Cremonini, R., Lamma, E. and Mello, P. ADES: An expert system for ATP design	1
Datseris, P. see Yang, B.	53
Datta, U. see Yang, B.	53
Daube, F. see Howard, H. C.	111
Fenves, S. J. see Reich, Y.	175
Hamilton, D. see Lampert, R.	35
Harris, W. see Cline, T.	195
Howard, H. C., Wang, J., Daube, F. and Rafiq, T. Applying design-dependent knowledge in structural engineering design	111
Kinigadner, A. see Becker, L. A.	23
Kroll, E., Lenz, E. and Wolberg, J. R. Rule-based generation of exploded-views and assembly sequences	143
Lakmazaheri, S. and Rasdorf, W. J. Constraint logic programming for the analysis and partial synthesis of truss structures	157
Lamma, E. see Cremonini, R.	1
Lampert, R., Hamilton, D. and Soloway, E. A case study of software testers	35
LeClair, S. R., Abrams, F. L. and Matejka, R. F. Qualitative process automation: self-directed manufacture of composite materials	125
Lenz, E. see Kroll, E.	143
Matejka, R. F. see LeClair, S. R.	125
Medoff, S. M., Register, M. S. and Swartwout, M. W. A framework for design verification and evaluation systems	71
Mello, P. see Cremonini, R.	1
Rafiq, T. see Howard, H. C.	111
Rasdorf, W. J. see Lakmazaheri, S.	157

Reich, Y. and Fenves, S. J. The potential of machine learning techniques for expert systems	175
Register, M. S. see Medoff, S. M.	71
Roy, M. see Becker, L. A.	23
Soloway, E. see Lampert, R.	35
Swartwout, M. W. see Medoff, S. M.	71
Wang, J. see Howard, H. C.	111
Wolberg, J. R. see Kroll, E.	143
Wu, Y. see Yang, B.	53
Yang, B. Datta, U., Datseris, P. and Wu, Y. An integrated system for design of mechanisms by an expert system—DOMES	53

Volume 3, No. 1

Cremonini, R., Lamma, E. and Mello, P. ADES: An expert system for ATP design	1
Becker, L. A., Bartlett, R., Kinigadner, A. and Roy, M. Using manufacturing process representations	23
Lampert, R., Hamilton, D. and Soloway, E. A case study of software testers	35
Yang, B., Datta, U., Datsaris, P. and Wu, Y. An integrated system for design of mechanisms by an expert system—DOMES	53

Volume 3, No. 2

Medoff, S. M., Register, M. S. and Swartwout, M. W. A framework for design verification and evaluation systems	71
Carney, S. P. and Brown, D. C. A continued investigation into qualitative reasoning about shape and fit	85
Howard, H. C., Wang, J., Daube, F. and Rafiq, T. Applying design-dependent knowledge in structural engineering design	111
LeClair, S. R., Abrams, F. L. and Matejka, R. F. Qualitative process automation: self-directed manufacture of composite materials	125
Books	137

Volume 3, No. 3

Kroll, E., Lenz, E. and Wolberg, J. R. Rule-based generation of exploded-views and assembly sequences	143
Lakmazaheri, S. and Rasdorf, W. J. Constraint logic programming for the analysis and partial synthesis of truss structures	157
Reich, Y. and Fenves, S. J. The potential of machine learning techniques for expert systems	175
Cline, T., Abelson, H. and Harris, W. Symbolic computing in engineering design	195

An International Forum in Computer Science . . .

Journal of Parallel and Distributed Computing

Editors-in-Chief: **Kai Hwang**

University of Southern California, Los Angeles

Howard J. Siegel

Purdue University, West Lafayette, Indiana

This international journal is directed to researchers, engineers, educators, managers, programmers, and users of computers who have particular interests in parallel processing and/or distributed computing. The *Journal of Parallel and Distributed Computing* publishes original research papers and timely review articles on the theory, design, evaluation, and practices of parallel and/or distributed computing systems.

Research Areas Include

- Theory of parallel/distributed computing
- Innovative computer architectures
- Supercomputers and numerical methods
- Software tools and environments
- Parallel algorithms and implementations
- Languages, compilers, and operating systems
- Shared-memory multiprocessors
- Multicomputers and distributed processing
- Fault-tolerant computing
- Artificial intelligence machines
- Applications and performance analysis
- Optical computing
- Neural networks

Volumes 8–10 (1990), 12 issues
ISSN 0743-7315

In the U.S.A. and Canada: \$261.00
All other countries: \$324.00

Sample copies and privileged personal subscription rates are available.
For more information or to enter your subscription, please write or call:



ACADEMIC PRESS, INC., Journal Promotion Dept.
1250 Sixth Avenue, San Diego, CA 92101, U.S.A. (619) 699-6742

All prices are in U.S. dollars and are subject to change without notice

S0086



JOURNAL OF MATHEMATICAL PSYCHOLOGY

EDITOR

Thomas S. Wallsten

The University of North Carolina at Chapel Hill

The *Journal of Mathematical Psychology* is concerned with empirical research directly relevant to theoretical questions within psychology and presents research articles, monographs and reviews, notes and comments, and book reviews in all areas of mathematical and theoretical psychology. The journal emphasizes the development or experimental testing of psychological process models. Work in fundamental measurement also falls within this journal's area of interest.

Research Areas Include

- Artificial intelligence and computer simulation (e.g., computational vision as applied to human vision) of psychological processes
- Fundamental measurement or scaling
- Human factors and human-computer interaction
- Learning and memory
- Motivational dynamics
- Neural networks and neural modeling
- Neuropsychological theories
- Perception and/or psychophysics
- Problem solving
- Psycholinguistics
- Psychometric research that bears on the explication of psychological concepts or process models

Volume 34 (1990), 4 issues

In the U.S.A. and Canada: \$165.00

ISSN 0022-2496

All other countries: \$203.00

Sample copies and privileged personal subscription rates are available.

To enter your subscription or for more information, please write or call:

ACADEMIC PRESS, INC., Journal Promotion Dept.
1250 Sixth Avenue, San Diego, CA 92101, U.S.A.
(619) 699-6742

All prices are in U.S. dollars and are subject to change without notice.

S0084

ACADEMIC PRESS *Harcourt Brace Jovanovich, Publishers*

San Diego New York Boston London Sydney Tokyo Toronto

(AI EDAM): *Artificial Intelligence for Engineering Design, Analysis and Manufacturing* is a journal intended for engineers and designers who see artificial intelligence technologies as powerful tools for handling difficult engineering problems and for research workers in artificial intelligence and computer science who are interested in applications of artificial intelligence and in the theoretical issues that arise from such applications. The Editor is particularly seeking articles that develop new and interesting applications based on the most up-to-date research in chemical, civil, industrial and mechanical (i.e. non-VLSI) engineering. Specifically,

the Journal is interested in the use of artificial intelligence in planning, design, finite element analysis, simulation, spatial reasoning and graphics, process planning, optimization and manufacturing. Areas of special interest include: expert (knowledge-based) systems, including knowledge acquisition and representation, control, and system architectures; spatial reasoning and the integration of graphics and solid modelers; artificial intelligence languages and machines, including exploratory programming environments and expert system shells.

INSTRUCTIONS FOR AUTHORS

Submission of manuscripts

Three (3) copies of articles, in English, should be submitted to the Editor. Research briefs and books for review should be submitted to the appropriate section editor.

Typescripts

Paper should be typed in *double* spacing throughout, including tables, footnotes, references and legends to tables and figures. One side of the paper, only, should be used and there should be a margin of at least 2.5 cm all round. The position of tables and figures should be clearly indicated, in sequence, in the text. Tables, footnotes and legends to figures should be typed separately. Where it is essential for clear cross-referencing, particularly in mathematically-orientated material, paragraphs and subparagraphs may be numbered, and the decimal system should be used, i.e. 1.1.1., 1.1.2., etc. A short running title of not more than 40 characters (including spaces) should be indicated if the full title is longer than this. The name of the laboratory where the work has been carried out should be indicated on the title page and the full postal address for the despatch of proofs and offprints should be included on a separate page. Photocopies of typescripts will not be accepted for publication. For refereeing purposes only, good photocopies may be submitted. Upon acceptance of the manuscript the top copy and the original illustrations should be submitted for publication.

Abstract

An abstract will be printed at the head of all papers: this should not exceed 300 words, and should be intelligible to the general reader without reference to the main text. Abbreviations should be avoided.

Author biographies

Brief author biographies will be printed at the end of each paper: they should not exceed 100 words for each author.

Conventions

References should be listed alphabetically by first author at the end of the paper. All authors' names should be given, followed by the year of publication, the full title of the journal, volume, issue number, and inclusive page numbers. For books, the full title should be given, followed by the volume number (if any), page numbers, place of publication and publisher. Citations in the text should read: Brown,

Smith & Robinson (1973). Where there is more than one author all names should be given when first mentioned and subsequently thus: Brown *et al.* (1973). The convention Brown (1973a), Brown (1973b) should be used where more than one paper by the author has appeared in the same year. Authors are responsible for checking the accuracy of all references and that all references cited in the text also appear in the list of references at the end of the paper. Examples of the style to be used are:

Reyling, G. Jr 1974. Performance and control of multiple multiprocessor systems. *Computer Design* **13**, 81–86.

Enslow, P.H. 1974. *Multiprocessors and Parallel Processing*. New York: John Wiley.

Abbreviations

Customary abbreviations will be accepted and the authors are recommended to employ *Système Internationale* (metric) units. Special and unusual symbols should be clearly identified, especially if handwritten.

Preparation of illustrations

Artwork, preferably no larger than 30 cm × 22 cm, may be submitted in any medium providing that the image is very sharp. When submitting illustrations it should be borne in mind that the page area is 222 mm × 177 mm and that computer output and program listings cannot be reduced by more than 20% before the clarity of the image is affected. Authors are requested to use the reverse side of the printout paper and to ensure that conditions, generally, are such as to assist maximum clarity in reproduction. Photographs will be accepted only if the information cannot be presented easily in any other form. Explanation and keys should, as far as possible, be placed in the legends.

Copyright/offprints

Authors submitting a manuscript do so on the understanding that if it is accepted for publication, exclusive copyright in the paper shall be assigned to the Publisher. In consideration for assignment of copyright, the Publisher will supply 50 offprints of each paper. Further offprints may be ordered at extra cost; the copyright assignment form and offprint order form will be sent with the proofs. The Publisher will not put any limitation on the personal freedom of the author to use material contained in the paper in other works which may be published elsewhere.

Contents

Kroll, E., Lenz, E. and Wolberg, J. R. Rule-based generation of exploded-views and assembly sequences	143
Lakmazaheri, S. and Rasdorf, W. J. Constraint logic programming for the analysis and partial synthesis of truss structures	157
Reich, Y. and Fenves, S. J. The potential of machine learning techniques for expert systems	175
Cline, T., Abelson, H. and Harris, W. Symbolic computing in engineering design	195