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KEY=INTELLIGENCE - GUERRA DUKE

CATALOGUE OF ARTIFICIAL INTELLIGENCE TOOLS

Springer *The purpose of this catalogue is to promote interaction between members of the AI' community. It will do this by announcing the existence of Ai techniques and portable software. and acting as a pOinter into the literature. Thus the AI community wili have access to a common. extensional definition of the field. which will: promote a common terminology. discourage the reinvention of wheels. and act as a clearing house for ideas and software. The cataiogue is a reference work providing a quick guide to the AI tools available for different jobs. It is not intended to be a textbook like the Artificial Intelligence Handbook. It. intentionally. only provides a brief description of each tool. with no extended discussion of the historical origin of the tool or how it has been used in particular AI programs, The focus is on techniques abstracted from their historical origins. The original version of the catalogue. was hastily built in 1983 as part of the UK SERC-Dol. IKBS. Architecture Study [IKBS Architecture Study 831. it has now been adopted by the SERC Specially Promoted Programme in IKBS and is kept as an on line document undergoing constant revision and refinement and published as a paperback by Springer Verlag.*

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Springer Science & Business Media *The purpose of this catalogue is to promote interaction between members of the AI' community. It will do this by announcing the existence of Ai techniques and portable software. and acting as a pOinter into the literature. Thus the AI community wili have access to a common. extensional definition of the field. which will: promote a common terminology. discourage the reinvention of wheels. and act as a clearing house for ideas and software. The cataiogue is a reference work providing a quick guide to the AI tools available for different jobs. It is not intended to be a textbook like the Artificial Intelligence Handbook. It. intentionally. only provides a brief description of each tool. with no extended discussion of the historical origin of the tool or how it has been used in particular AI programs, The focus is on techniques abstracted from their historical origins. The original version of the catalogue. was hastily built in 1983 as part of the UK SERC-Dol. IKBS. Architecture Study [IKBS Architecture Study 831. it has now been adopted by the SERC Specially Promoted Programme in IKBS and is kept as an on line document undergoing constant revision and refinement and published as a paperback by Springer Verlag.*

CATALOGUE OF ARTIFICIAL INTELLIGENCE TECHNIQUES

Springer Science & Business Media *The purpose of the Catalogue of Artificial Intelligence Techniques is to promote interaction between members of the AI community. It does this by announcing the existence of AI techniques, and acting as a pointer into the literature. Thus the AI community will have access to a common, extensional definition of the field, which will promote a common terminology, discourage the reinvention of wheels, and act as a clearing house for ideas and algorithms. The catalogue is a reference work providing a quick guide to the AI techniques available for different jobs. It is not intended to be a textbook like the Artificial Intelligence Handbook. Intentionally, it only provides a brief description of each technique, with no extended discussion of its historical origin or how it has been used in particular AI programs. The original version of the catalogue was hastily built in 1983 as part of the UK SERC-Dol, IKBS Architecture Study. It was adopted by the UK Alvey Programme and, during the life of the programme, was both circulated to Alvey grant holders in hard copy form and maintained as an on-line document. A version designed for the international community was published as a paperback by Springer-Verlag. All these versions have undergone constant revision and refinement. Springer-Verlag has agreed to reprint the catalogue at frequent intervals in order to keep it up to date and this is the third edition of their paperback version.*

COMPUTATION OF LANGUAGE

AN ESSAY ON SYNTAX, SEMANTICS AND PRAGMATICS IN NATURAL MAN-MACHINE COMMUNICATION

Springer Science & Business Media *The study of linguistics has been forever changed by the advent of the computer. Not only does the machine permit the processing of enormous quantities of text thereby securing a better empirical foundation for conclusions-but also, since it is a modelling device, the machine allows the implementation of theories of grammar and other kinds of language processing. Models can have very unexpected properties both good and bad-and it is only through extensive tests that the value of a model can be properly assessed. The computer revolution has been going on for many years, and its importance for linguistics was recognized early on, but the more recent spread of personal workstations has made it a reality that can no longer be ignored by anyone in the subject. The present essay, in particular, could never have been written without the aid of the computer. I know personally from conversations and consultations with the author over many months how the book has changed. If he did not have at his command a powerful typesetting program, he would not have been able to see how his writing looked and exactly how it had to be revised and amplified. Even more significant for the evolution of the linguistic theory is the easy testing of examples made possible by the implementation of the parser and the computer-held lexicon. Indeed, the rule set and lexicon grew substantially after the successes of the early implementations created the desire to incorporate more linguistic phenomena.*

SEARCH IN ARTIFICIAL INTELLIGENCE

Springer Science & Business Media *Search is an important component of problem solving in artificial intelligence (AI) and, more generally, in computer science, engineering and operations research. Combinatorial optimization, decision analysis, game playing, learning, planning, pattern recognition, robotics and theorem proving are some of the areas in which search algbrithms playa key role. Less than a decade ago the conventional wisdom in artificial intelligence was that the best search algorithms had already been invented and the likelihood of finding new results in this area was very small. Since then many new insights and results have been obtained. For example, new algorithms for state space, AND/OR graph, and game tree search were discovered. Articles on new theoretical developments and experimental results on backtracking, heuristic search and constraint propaga tion were published. The relationships among various search and combinatorial algorithms in AI, Operations Research, and other fields were clarified. This volume brings together some of this recent work in a manner designed to be accessible to students and professionals interested in these new insights and developments.*

ADVANCES IN EMPIRICAL TRANSLATION STUDIES

DEVELOPING TRANSLATION RESOURCES AND TECHNOLOGIES

Cambridge University Press *Introduces the integration of theoretical and applied translation studies for socially-oriented and data-driven empirical translation research.*

INTELLIGENT SYSTEMS AND APPLICATIONS

PROCEEDINGS OF THE 2021 INTELLIGENT SYSTEMS CONFERENCE (INTELLISYS).. VOLUME 3

Springer Nature *This book presents Proceedings of the 2021 Intelligent Systems Conference which is a remarkable collection of chapters covering a wider range of topics in areas of intelligent systems and artificial intelligence and their applications to the real world. The conference attracted a total of 496 submissions from many academic pioneering researchers, scientists, industrial engineers, and students from all around the world. These submissions underwent a double-blind peer-review process. Of the total submissions, 180 submissions have been selected to be included in these proceedings. As we witness exponential growth of computational intelligence in several directions and use of intelligent systems in everyday applications, this book is an ideal resource for reporting latest innovations and future of AI. The chapters include theory and application on all aspects of artificial intelligence, from classical to intelligent scope. We hope that readers find the book interesting and valuable; it provides the state-of-the-art intelligent methods and techniques for solving real-world problems along with a vision of the future research. .*

PROCEEDINGS OF THE 1993 INTERNATIONAL CONFERENCE ON PARALLEL PROCESSING

CRC Press *This three-volume work presents a compendium of current and seminal papers on parallel/distributed processing offered at the 22nd International Conference on Parallel Processing, held August 16-20, 1993 in Chicago, Illinois. Topics include processor architectures; mapping algorithms to parallel systems, performance evaluations; fault diagnosis, recovery, and tolerance; cube networks; portable software; synchronization; compilers; hypercube computing; and image processing and graphics. Computer professionals in parallel processing, distributed systems, and software engineering will find this book essential to complete their computer reference library.*

AN INTRODUCTION TO DEFAULT LOGIC

Springer Science & Business Media *This book is written for those who are interested in a fonnalization of human reasoning, especially in order to build "intelligent" computer systems. Thus, it is mainly designed for the Artificial Intelligence community, both students and researchers, although it can be useful for people working in related fields like cognitive psychology. The major theme is not Artificial Intelligence applications, although these are discussed throughout in sketch fonn. Rather, the book places a heavy emphasis on the fonnal development of default logic, results and problems. Default logic provides a fonnalism for an important part of human reasoning. Default logic is specifically concerned with common sense reasoning, which has recently been recognized in the Artificial Intelligence literature to be of fundamental importance for knowledge representation. Previously, fonnalized reasoning systems failed in real world environments, though succeeding with an acceptable ratio in well-defined environments. This situation enabled empirical explorations and the design of systems without theoretical justification. In particular, they could not be compared since there was no basis to judge*

their respective merits. Default logic turned out to be very fruitful by proving the correctness of some of them. We hope that this book will initiate other successful developments in default logic.

USER MODELS IN DIALOG SYSTEMS

Springer Science & Business Media *User models have recently attracted much research interest in the field of artificial intelligence dialog systems. It has become evident that flexible user-oriented dialog behavior of such systems can be achieved only if the system has access to a model of the user containing assumptions about his/her background knowledge as well as his/her goals and plans in consulting the system. Research in the field of user models investigates how such assumptions can be automatically created, represented and exploited by the system in the course of an "on-line" interaction with the user. The communication medium in this interaction need not necessarily be a natural language, such as English or German. Formal interaction languages are also permit ted. The emphasis is placed on systems with natural language input and output, however. A dozen major and several more minor user modeling systems have been de signed and implemented in the last decade, mostly in the context of natural-language dialog systems. The goal of UM86, the first international workshop on user model ing, was to bring together the researchers working on these projects so that results could be discussed and analyzed, and hopefully general insights be found, that could prove useful for future research. The meeting took place in Maria Laach, a small village some 40 miles south of Bonn, West Germany. 25 prominent researchers were invited to participate.*

COMPUTATIONAL MODELS OF LEARNING

Springer Science & Business Media *In recent years, machine learning has emerged as a significant area of research in artificial intelligence and cognitive science. At present, research in the field is being intensified from both the point of view of theory and of implementation, and the results are being introduced in practice. Machine learning has recently become the subject of interest of many young and talented scientists whose bold ideas have greatly contributed to the broadening of knowledge in this rapidly developing field of science. This situation has manifested itself in an increasing number of valuable contributions to scientific journals. However, such papers are necessarily compact descriptions of research problems. Computational Models of Learning supplements these contributions and is a collection of more extensive essays. These essays provide the reader with an increased knowledge of carefully selected problems of machine learning.*

EURO-PAR 2015: PARALLEL PROCESSING

21ST INTERNATIONAL CONFERENCE ON PARALLEL AND DISTRIBUTED COMPUTING, VIENNA, AUSTRIA, AUGUST 24-28, 2015, PROCEEDINGS

Springer *This book constitutes the refereed proceedings of the 21st International Conference on Parallel and Distributed Computing, Euro-Par 2015, held in Vienna, Austria, in August 2015. The 51 revised full papers presented together with 2 invited papers were carefully reviewed and selected from 190 submissions. The papers are organized in the following topical sections: support tools and environments; performance modeling, prediction and evaluation; scheduling and load balancing; architecture and compilers; parallel and distributed data management; grid, cluster and cloud computing; distributed systems and algorithms; parallel and distributed programming, interfaces and languages; multi- and many-core programming; theory and algorithms for parallel computation; numerical methods and applications; and accelerator computing.*

PARALLEL ALGORITHMS FOR MACHINE INTELLIGENCE AND VISION

Springer Science & Business Media *Recent research results in the area of parallel algorithms for problem solving, search, natural language parsing, and computer vision, are brought together in this book. The research reported demonstrates that substantial parallelism can be exploited in various machine intelligence and vision problems. The chapter authors are prominent researchers actively involved in the study of parallel algorithms for machine intelligence and vision. Extensive experimental studies are presented that will help the reader in assessing the usefulness of an approach to a specific problem. Intended for students and researchers actively involved in parallel algorithms design and in machine intelligence and vision, this book will serve as a valuable reference work as well as an introduction to several research directions in these areas.*

EXPLORATION AND INNOVATION IN DESIGN

TOWARDS A COMPUTATIONAL MODEL

Springer Science & Business Media *Exploration and Innovation in Design is one of the first books to present both conceptual and computational models of processes which have the potential to produce innovative results at early stages of design. Discussed here is the concept of exploration where the system, using computational processes, moves outside predefined available decisions. Sections of this volume discuss areas such as design representation and search, exploration and the emergence of new criteria, and precedent-based adaptation. In addition, the author presents the overall architecture of a design system and shows how the pieces fit together into one coherent system. Concluding chapters of the book discuss relationships of work in design to other research efforts, applications, and future research directions in design. The ideas and processes presented in this volume further our understanding of computational models of design, particularly those that are capable of assisting in the production of non-routine designs, and affirm that we are indeed moving toward a science of design.*

REDUCE

SOFTWARE FOR ALGEBRAIC COMPUTATION

Springer Science & Business Media *CONTRIBUTED BY DR. ANTHONY C. HEARN THE RAND CORPORATION, SANTA MONICA, CALIFORNIA REDUCE is a computer program for algebraic computation that IS III world-wide use by thousands of scientists, engineers, and mathematicians. Although it traces its beginnings to 1963, until recently it has only been available on main-frame computers because of its relatively large resource requirements. In 1980 I predicted (1) that by the mid-1980's it would be possible to obtain personal computers in the $10,000 $20,000 range capable of running REDUCE. I am therefore delighted to see that machines of the power of the IBM PC can now run this system, even though these computers are more modestly priced than my 1980 vision of the personal algebra machine. In addition to the need for the more widespread access that personal computers can now provide, there has been a longstanding need for a textbook to help the beginning user become better acquainted with the system. I am therefore very glad that Dr. Rayna has undertaken to write such a book, just as the era of the REDUCE personal algebra machine is beginning. In order to understand the nature of REDUCE, a little history is in order. In 1963 I met Dr. John McCarthy, the inventor of LISP.*

EXPERT SYSTEM APPLICATIONS

Springer Science & Business Media *While expert systems technology originated in the United States, its development has become an international concern. Since the start of the DENDRAL project at Stanford University over 15 years ago, with its objective of problem-solving via the automation of actual human expert knowledge, significant expert systems projects have been completed in countries rang ing from Japan to France, Spain to China. This book presents a sample of five such projects, along with four substantial reports of mature studies from North American researchers. Two important issues of expert system design permeate the papers in this volume. The first concerns the incorporation of substantial numeric knowledge into a system. This has become a significant focus of work as researchers have sought to apply expert systems tech nology to complex, real-world domains already subject to statistical or algebraic description (and handled well at some level in numeric terms). A second prominent issue is that of representing control knowledge in a manner which is both explicit, and thus available for inspection, and compatible with the semantics of the problem domain.*

A THEORY OF HEURISTIC INFORMATION IN GAME-TREE SEARCH

Springer Science & Business Media *Searching is an important process in most AI systems, especially in those AI production systems consisting of a global database, a set of production rules, and a control system. Because of the intractability of uninformed search procedures, the use of heuristic information is necessary in most searching processes of AI systems. This important concept of heuristic informatioD is the central topic of this book. We first use the 8-puzzle and the game tic-tac-toe (noughts and crosses) as examples to help our discussion. The 8-puzzle consists of eight numbered movable tiles set in a 3 x 3 frame. One cell of the frame is empty so that it is possible to move an adjacent numbered tile into the empty cell. Given two tile configurations, initial and goal, an 8-puzzle problem consists of changing the initial configuration into the goal configuration, as illustrated in Fig. 1.1. A solution to this problem is a sequence of moves leading from the initial configuration to the goal configuration, and an optimal solution is a solution having the smallest number of moves. Not all problems have solutions; for example, in Fig. 1.1, Problem 1 has many solutions while Problem 2 has no solution at all.*

NATURAL LANGUAGE GENERATION SYSTEMS

Springer Science & Business Media *Natural language generation is a field within artificial intelligence which looks ahead to the future when machines will communicate complex thoughts to their human users in a natural way. Generation systems supply the sophisticated knowledge about natural languages that must come into play when one needs to use wordings that will overpower techniques based only on symbolic string manipulation techniques. Topics covered in this volume include discourse theory, mechanical translation, deliberate writing, and revision. Natural Language Generation Systems contains contributions by leading researchers in the field. Chapters contain details of grammatical treatments and processing seldom reported on outside of full length monographs.*

PROLOG BY EXAMPLE

HOW TO LEARN, TEACH AND USE IT

Springer Science & Business Media *Prolog has a declarative style. A predicate definition includes both the input and output parameters, and it allows a programmer to define a desired result without being concerned about the detailed instructions of how it is to be computed. Such a declarative language offers a solution to the software crisis, because it is shorter and more concise, more powerful and understandable than present-day languages. Logic highlights novel aspects of programming, namely using the same program to compute a relation and its inverse, and supporting deductive retrieval of informa tion. This is a book about using Prolog. Its real point is the examples introduced from Chapter 3 onwards, and so a Prolog programmer does not need to read Chapters 1 and 2, which are oriented more to teachers and to students, respec tively. The book is recommended for introductory and advanced university courses, where students may need to remember the basics about logic program ming and Prolog, before starting doing. Chapters 1 and 2 were also kept for the sake of unity of the whole material. In Chapter 1 a teaching strategy is explained based on the key concepts of Pro log which are novel aspects of programming. Prolog is enhanced as a computer programming language used for solving problems that involve objects and the relationships between objects. This chapter provides a pedagogical tour of pre scriptions for the organization of Prolog programs, by pointing out the main draw backs novices may encounter.*

PROGRAMMING IN PROLOG

USING THE ISO STANDARD

Springer Science & Business Media *Since the first publishing of Programming in Prolog in 1981, Pro log has continued to attract an unexpectedly great deal of interest in the computer science community and is now seen as a potential ba sis for an important new generation of programming languages and systems. We hope that Programming in Prolog has partially satisfied the increasing need for an easy, yet comprehensive introduction to the language as a tool for practical programming. In this second edition we have taken the opportunity to improve the presentation and to correct various minor errors in the original. We thank the many people who have given us suggestions for corrections and improvement. W. F. C. C. S. M. Cambridge, England August, 198-1 Preface to the First Edition The computer programming language Prolog is quickly gaining popularity throughout the world. Since its beginnings around 1970, Prolog has been chosen by many programmers for applications of symbolic computation, including: • relational databases • mathematical logic • abstract problem solving • understanding naturallangur~ge • design automation • symbolic equation solving • biochemical structure analysis • many areas of artificial intelligence Until now, there has been no textbook with the aim of teaching Prolog as a practical programming language. It is perhaps a tribute to Prolog that so many people have been motivated to learn it by referring to the necessarily concise reference manuals, a few published papers, and by the orally transmitted 'folklore' of the modern computing community.*

QUALITATIVE PROCESS THEORY USING LINGUISTIC VARIABLES

Springer Science & Business Media *8. 5 Summary In this chapter we have identified three basic patterns of influences that lead to ambiguity in the QP analysis of the basic active furnace state. We have then shown how modification of these patterns, by adding equilibrium values and sensitivity annotations on influence arcs, could permit resolu tion of the ambiguities. Finally, we have described in detail the extensions needed to the basic influence resolution algorithm in QP theory to oper ate on these extended descriptions. We have also shown that the modified influence resolution algorithm corrects an error in Forbus' original method for combining influences. We have then presented an extended example in which introduction of equilibrium assumptions eliminates all ambigu ity in the influence resolution deduction. In the next chapter we extend these techniques further, by developing a qualitative perturbation analysis technique that permits us to answer "what ir' control questions; then we extend this technique to obtain quantitative, as well as qualitative, effects of hypothetical control actions. 8.*

ABDUCTIVE INFERENCE MODELS FOR DIAGNOSTIC PROBLEM-SOLVING

Springer Science & Business Media *Making a diagnosis when something goes wrong with a natural or m- made system can be difficult. In many fields, such as medicine or electr- ics, a long training period and apprenticeship are required to become a skilled diagnostician. During this time a novice diagnostician is asked to assimilate a large amount of knowledge about the class of systems to be diagnosed. In contrast, the novice is not really taught how to reason with this knowledge in arriving at a conclusion or a diagnosis, except perhaps implicitly through ease examples. This would seem to indicate that many of the essential aspects of diagnostic reasoning are a type of intuiti- based, common sense reasoning. More precisely, diagnostic reasoning can be classified as a type of inf- ence known as abductive reasoning or abduction. Abduction is defined to be a process of generating a plausible explanation for a given set of obs- vations or facts. Although mentioned in Aristotle's work, the study of f- mal aspects of abduction did not really start until about a century ago.*

FOUNDATIONS OF LOGIC PROGRAMMING

Springer Science & Business Media *In the two and a half years since the frrst edition of this book was published, the field of logic programming has grown rapidly. Consequently, it seemed advisable to try to expand the subject matter covered in the first edition. The new material in the second edition has a strong database flavour, which reflects my own research interests over the last three years. However, despite the fact that the second edition has about 70% more material than the first edition, many worthwhile topic!! are still missing. I can only plead that the field is now too big to expect one author to cover everything. In the second edition, I discuss a larger class of programs than that discussed in the first edition. Related to this, I have also taken the opportunity to try to improve some of the earlier terminology. Firstly, I introduce "program statements", which are formulas of the form A+-W, where the head A is an atom and the body W is an arbitrary formula. A "program" is a finite set of program statements. There are various restrictions of this class. "Normal" programs are ones where the body of each program statement is a conjunction of literals. (The terminology "general", used in the first edition, is obviously now inappropriate).*

NATURAL LANGUAGE PARSING SYSTEMS

Springer Science & Business Media *Up to now there has been no scientific publication on natural lan guage research that presents a broad and complex description of the current problems of parsing in the context of Artificial Intelli gence. However, there are many interesting results from this domain appearing mainly in numerous articles published in pro fessional journals. In view of this situation, the objective of this book is to enable scientists from different countries to present the results of their research on natural language parsing in the form of more detailed papers than would be possible in professional jour nals. This book thus provides a collection of studies written by well known scientists whose earlier publications have greatly contributed to the development of research on natural language parsing. Jaime G. Carbonell and Philip J. Hayes present in their paper "Robust Parsing Using Multiple Construction-Specific Strategies" two small experimental parsers, implemented to illustrate the advantages of a multi-strategy approach to parsers, with strategies selected according to the type of construction being parsed at any given time. This presentation is followed by the description of a parsing algorithm, integrating some of the best features of the two smaller parsers, including case-frame instantiation and partial pat tern-matching strategies.*

LOGIC GRAMMARS

Springer Science & Business Media *Logic grammars have found wide application both in natural language processing and in formal applications such as compiler writing. This book introduces the main concepts involving natural and formal language processing in logic programming, and discusses typical problems which the reader may encounter, proposing various methods for solving them. The basic material is presented in depth; advanced material, involving new logic grammar formalisms and applications, is presented with a view towards breadth. Major sections of the book include: grammars for formal language and linguistic research, writing a simple logic grammar, different types of logic grammars, applications, and logic grammars and concurrency. This book is intended for those interested in logic programming, artificial intelligence, computational linguistics, Fifth Generation computing, formal languages and compiling techniques. It may be read profitably by upper-level undergraduates, post-graduate students, and active researchers on the above-named areas. Some familiarity with Prolog and logic programming would be helpful; the authors, however, briefly describe Prolog and its relation to logic grammars. After reading Logic Grammars, the reader will be able to cope with the ever-increasing literature of this new and exciting field.*

THE KNOWLEDGE FRONTIER

ESSAYS IN THE REPRESENTATION OF KNOWLEDGE

Springer Science & Business Media *Knowledge representation is perhaps the most central problem confronting artificial intelligence. Expert systems need knowledge of their domain of expertise in order to function properly. Computer vlslOn systems need to know characteristics of what they are "seeing" in order to be able to fully interpret scenes. Natural language systems are invaluably aided by knowledge of the subject of the natural language discourse and knowledge of the participants in the discourse. Knowledge can guide learning systems towards better understanding and can aid problem solving systems in creating plans to solve various problems. Applications such as intelligent tutoring. computer-aided VLSI design. game playing. automatic programming. medical reasoning. diagnosis in various domains. and speech recogOItlOn. to name a few. are all currently experimenting with knowledge-based approaches. The problem of knowledge representation breaks down into several subsidiary problems including what knowledge to represent in a particular application. how to extract or create that knowledge. how to represent the knowledge efficiently and effectively. how to implement the knowledge representation scheme chosen. how to modify the knowledge in the face of a changing world. how to reason with the knowledge. and how tc use the knowledge appropriately in the creation of the application solution. This volume contains an elaboration of many of these basic issues from a variety of perspectives.*

SATISFIABILITY PROBLEM

THEORY AND APPLICATIONS : DIMACS WORKSHOP, MARCH 11-13, 1996

American Mathematical Soc. *The satisfiability (SAT) problem is central in mathematical logic, computing theory, and many industrial applications. There has been a strong relationship between the theory, the algorithms, and the applications of the SAT problem. This book aims to bring together work by the best theorists, algorithmists, and practitioners working on the sat problem and on industrial applications, as well as to enhance the interaction between the three research groups. The book features the applications of theoretical/algorithmic results to practical problems and presents practical examples for theoretical/algoritmic study. Major topics covered in the book include practical and industial SAT problems and benchmarks, significant case studies and applications of the SAT problem and SAT algorithms, new algorithms and improved techniques for satisfiability testing, specific data structures and implementation details of the SAT algorithms, and the theoretical study of the SAT problem and SAT algorithms.*

AI MAGAZINE

ADVANCES IN COMPUTATIONAL COLLECTIVE INTELLIGENCE

12TH INTERNATIONAL CONFERENCE, ICCCI 2020, DA NANG, VIETNAM, NOVEMBER 30 – DECEMBER 3, 2020, PROCEEDINGS

Springer Nature *This book constitutes refereed proceedings of the 12th International Conference on International Conference on Computational Collective Intelligence, ICCCI 2020, held in Da Nang, Vietnam, in November – December 2020. Due to the the COVID-19 pandemic the conference was held online. The 68 papers were thoroughly reviewed and selected from 314 submissions. The papers are organized according to the following topical sections: data mining and machine learning; deep learning and applications for industry 4.0; recommender systems; computer vision techniques; decision support and control systems; intelligent management information systems; innovations in intelligent systems; intelligent modeling and simulation approaches for games and real world systems; experience enhanced intelligence to IoT; data driven IoT for smart society; applications of collective intelligence; natural language processing; low resource languages processing; computational collective intelligence and natural language processing.*

RESEARCH DIRECTIONS IN COMPUTATIONAL MECHANICS

National Academies Press *Computational mechanics is a scientific discipline that marries physics, computers, and mathematics to emulate natural physical phenomena. It is a technology that allows scientists to study and predict the performance of various products--important for research and development in the industrialized world. This book describes current trends and future research directions in computational mechanics in areas where gaps exist in current knowledge and where major advances are crucial to continued technological developments in the United States.*

ARTIFICIAL INTELLIGENCE IN DESIGN '94

Springer Science & Business Media *Design is an important research topic in engineering and architecture, since design is not only a means of change but also one of the keystones of economic competitiveness and the fundamental precursor to manufacturing. However, our understanding of design as a process and our ability to model it are still very limited. The development of computational models founded on the artificial intelligence paradigm has provided an impetus for much of current design research -- both computational and cognitive. Notwithstanding their immaturity noticeable advances have been made both in extending our understanding of design and in developing tools based on that understanding. The papers in this volume are from the Third International Conference on Artificial Intelligence in Design held in August 1994 in Lausanne, Switzerland. They represent the cutting edge of research and development in this field. They are of particular interest to researchers, developers and users of computer systems in design. This volume demonstrates both the breadth and depth of artificial intelligence in design and points the way forward for our understanding of design as a process and for the development of computer-based tools to aid designers.*

HANDBOOK OF COMBINATORIAL OPTIMIZATION

SUPPLEMENT

Springer Science & Business Media *This volume can be considered as a supplementary volume to the major three-volume Handbook of Combinatorial Optimization published by Kluwer. It can also be regarded as a stand-alone volume which presents chapters dealing with various aspects of the subject including optimization problems and algorithmic approaches for discrete problems. Audience: All those who use combinatorial optimization methods to model and solve problems.*

PARALLEL PROCESSING FOR ARTIFICIAL INTELLIGENCE 1

Elsevier *Parallel processing for AI problems is of great current interest because of its potential for alleviating the computational demands of AI procedures. The articles in this book consider parallel processing for problems in several areas of artificial intelligence: image processing, knowledge representation in semantic networks, production rules, mechanization of logic, constraint satisfaction, parsing of natural language, data filtering and data mining. The publication is divided into six sections. The first addresses parallel computing for processing and understanding images. The second discusses parallel processing for semantic networks, which are widely used means for representing knowledge - methods which enable efficient and flexible processing of semantic networks are expected to have high utility for building large-scale knowledge-based systems. The third section explores the automatic parallel execution of production systems, which are used extensively in building rule-based expert systems - systems containing large numbers of rules are slow to execute and can significantly benefit from automatic parallel execution. The exploitation of parallelism for the mechanization of logic is dealt with in the fourth section. While sequential control aspects pose problems for the parallelization of production systems, logic has a purely declarative interpretation which does not demand a particular evaluation strategy. In this area, therefore, very large search spaces provide significant potential for parallelism. In particular, this is true for automated theorem proving. The fifth section considers the problem of constraint satisfaction, which is a useful abstraction of a number of important problems in AI and other fields of computer science. It also discusses the technique of consistent labeling as a preprocessing step in the constraint satisfaction problem. Section VI consists of two articles, each on a different, important topic. The first discusses parallel formulation for the Tree Adjoining Grammar (TAG), which is a powerful formalism for describing natural languages. The second examines the suitability of a parallel programming paradigm called Linda, for solving problems in artificial intelligence. Each of the areas discussed in the book holds many open problems, but it is believed that parallel processing will form a key ingredient in achieving at least partial solutions. It is hoped that the contributions, sourced from experts around the world, will inspire readers to take on these challenging areas of inquiry.*

EXPERT SYSTEMS AND RELATED TOPICS

SELECTED BIBLIOGRAPHY AND GUIDE TO INFORMATION SOURCES

IGI Global *This comprehensive reference to all areas of expert systems and applications, plus advanced related topics, lets you spend your time reading expert systems literature rather than searching for it. It gives you a source of historical perspectives and outlooks on the future of the field. Whether you are a manager, a developer or an end user or researcher, Expert Systems and Related Topics: Selected Bibliography & Guide to Information Sources puts all the sources of expert systems literature at your fingertips.*

WHO'S WHO IN SCOTLAND

CATALYZING INQUIRY AT THE INTERFACE OF COMPUTING AND BIOLOGY

National Academies Press *Advances in computer science and technology and in biology over the last several years have opened up the possibility for computing to help answer fundamental questions in biology and for biology to help with new approaches to computing. Making the most of the research opportunities at the interface of computing and biology requires the active participation of people from both fields. While past attempts have been made in this direction, circumstances today appear to be much more favorable for progress. To help take advantage of these opportunities, this study was requested of the NRC by the National Science Foundation, the Department of Defense, the National Institutes of Health, and the Department of Energy. The report provides the basis for establishing cross-disciplinary collaboration between biology and computing including an analysis of potential impediments and strategies for overcoming them. The report also presents a wealth of examples that should encourage students in the biological sciences to look for ways to enable them to be more effective users of computing in their studies.*

EXPERT SYSTEMS AND DECISION SUPPORT IN MEDICINE

33RD ANNUAL MEETING OF THE GMDS EFMI SPECIAL TOPIC MEETING PETER L. REICHERTZ MEMORIAL CONFERENCE HANNOVER, SEPTEMBER 26–29, 1988 PROCEEDINGS

Springer Science & Business Media *The 33rd Annual Meeting of the German Association for Medical Documentation, Informatics and Statistics was combined with a Special Topic Conference of the European Federation for Medical Informatics and takes place at Hannover, F. R. of Germany, from September 26 to 29, 1988. It was planned and initililly prepared by the late Prof. P. L Reichertz, who headed the Hannover institute from 1969 to 1987. To commemorate his contribution to the development of medicine the conference was devoted to him "Peter Reichertz Memorial Conference on Expert Systems and Decision Support in Medicine" Since computers in the early Fifties were first applied to support medical reasoning, various phases of euphoria and resi~ation have . followed. Every new methodology which became technically possible was and will be applied to the old questlon of how to diagnose diseases more reliably. Artificial Intelligence is just one new approach to the old challenge. Over the years some· authors have been very optimistic and put forward opinions which motivated the common press to coin the phrase 'Dr. med. computer'. Papers printed under this heading rebuffed the majority of physiCians for many years. Today we know that medical decision making is a most complex buman performance. And 30 years of research on decision support have given us only limited insight into the underlying processes. Most of the principal methodological questions were already asked very early on.*

BOOKS IN PRINT SUPPLEMENT

INTELLIGENT SOFTWARE METHODOLOGIES, TOOLS AND TECHNIQUES

13TH INTERNATIONAL CONFERENCE, SOMET 2014, LANGKAWI, MALAYSIA, SEPTEMBER 22-24, 2014. REVISED SELECTED PAPERS

Springer *This book constitutes the best papers selection from the proceedings of the 13th International Conference on Intelligent Software Methodologies, Tools and Techniques, SoMeT 2014, held in Langkawi, Malaysia, in September 2014. The 27 full papers presented were carefully reviewed, thoroughly revised or enlarged, and selected as best papers from the 79 published proceedings papers, which had originally been selected from 192 submissions. The papers are organized in topical sections on artificial intelligence techniques in software engineering; requirement engineering, high-assurance system; intelligent software systems design; creative and arts in interactive software design; software methodologies for reliable software design; software quality and assessment for business enterprise; software analysis and performance model; software applications systems.*

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