

NEWSLETTER / SEPTEMBER 1985

CANADIAN ARTIFICIAL INTELLIGENCE 5

An official publication of CSCSI/SCEIO Canadian Society for Computational Studies of Intelligence/
Société canadienne pour l'étude de l'intelligence par ordinateur





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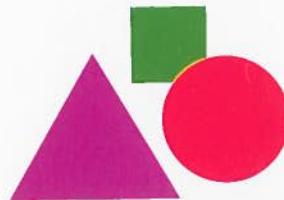
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NEWSLETTER
**CANADIAN
 ARTIFICIAL
 INTELLIGENCE**

An official publication of the Canadian Society for Computational Studies of Intelligence / Société canadienne pour l'étude de l'Intelligence par ordinateur

Number 5, September 1985

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Canadian Society for Computational Studies of Intelligence

Société canadienne pour l'étude de l'intelligence par ordinateur

CSCSI/SCEIO is the Canadian society for the promotion of interest and activity in Artificial Intelligence. It conducts workshops and fully refereed national conferences, publishes this newsletter, sponsors the journal *Computational Intelligence*, and coordinates activities with related societies, government, and industry.

To join CSCSI/SCEIO, use the membership form in this issue. Non-Canadian members are welcomed.

CSCSI/SCEIO is affiliated with the Canadian Information Processing Society and the International Joint Council on Artificial Intelligence.

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Canadian Artificial Intelligence Newsletter

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The *Canadian Artificial Intelligence Newsletter* is published quarterly by CSCSI/SCEIO, and is a benefit of membership in the society.

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The *Newsletter* solicits contributions in English or French on any matter related to artificial intelligence, including:

- Articles of general interest.
- Descriptions of current research and courses.
- Reports of recent conferences and workshops.
- Announcements of forthcoming activities.
- Calls for papers.
- Book reviews (and books for review).
- Announcements of new AI companies and products.
- Opinions, counterpoints, polemic, controversy.
- Abstracts of recent publications, theses, and technical reports.
- Humour, cartoons, artwork.
- Advertisements (rates upon request).
- Anything else concerned with AI.

Please send submissions, either on paper or by network, to the editor or to your local *Newsletter* representative (see list on page 3). On-line submissions are preferred, but they should not contain justification spaces or hyphenated line breaks.

The *Newsletter* is published in March, June, September, and December. Material for publication is due on the 15th of the preceding month.

Please send changes of address to:
CSCSI/SCEIO, c/o CIPS
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Toronto, CANADA M5T 2Y1

Editor rebuts self in exclusive interview

Graeme Hirst
Editor

One of the problems I have as editor of this publication is that I never receive any nasty letters. I occasionally receive flattering letters from people who tell me how nice *Canadian A. I.* is, but never the slightest bit of constructive criticism about how it could be made better. This worries me, because there is plenty about the magazine to criticize, including, in particular, certain aspects of editorial policy that might have been inferred from the previous issue.

I figure that if the readers won't take me to task, I have to do it myself. I therefore caught myself off guard in my office and obtained the following no-holds-barred interview with myself.

Dr Hirst, now that you have completed the first year of publication in its new format, how is Canadian Artificial Intelligence doing?

Quite well, thank you. The membership of CSCSI/SCEIO, that is, the bulk of our readership, has more than doubled in number from under 300 to 650 in the last year. In addition, we distribute about 100 complimentary copies to selected people in Canadian media and government departments, and another 100 or so as samples to prospective members. Our readership is therefore much greater than we originally expected, and I think there is room for continued growth.

In addition, the issues are about twice the size we originally planned for them to be, and we have been able to introduce a glossy cover and high-quality typesetting. While CSCSI/SCEIO membership fees cover some of the costs, this growth would not have been possible without the advertising we have attracted, much more than we had expected.

I'm pleased you brought up the matter of advertising, Dr Hirst, for I cannot but notice that Canadian Artificial Intelligence seems to lack a certain independence in its editorial policy. For example, in the June issue you have printed as

editorial matter what seem to be press releases from two companies, Logicware and Applied AI, who happen to be two of your largest advertisers. You also have reviews that are largely complimentary of two books that happen to be advertised in the same issue. Is Canadian A.I. one of those magazines that carefully tailors its articles around its paid advertising?

No. Our policy is that the two remain independent. I agree that the same company names tend to turn up in each, but there is a simple reason for that: the companies that think to advertise in the magazine tend to also be those that think to favour us with press releases, or books for review.

So you do print press releases then?

In some cases, but usually only after heavy editing so that they meet the content and style requirements of the magazine. It is my position that, in general, at the present stage of AI in Canada, the existence of an AI company is news, and any new Canadian company is worth an article on who they are and what they are doing. Such information has to come from the company itself, and often it comes in the form of a press release.

We by no means print any press release we receive. You should see some of the ones we get. "Fred's Software of North Dakota announces the sale this morning of its TOYLISP system to the Boise, Idaho, Central High School." That kind of stuff.

What about books?

I was pleased that we were able to say nice things about our advertisers' books, because, after all, I'd like their repeat business. But if the books had turned out to be rotten, I would have run the reviews anyway and hoped that the publishers wouldn't be petty about the matter.

I notice that this present issue contains a brochure from The Report Store that quotes from a review you yourself wrote for the last issue.

Yeah. It's a bit embarrassing. I think from now on, if I can't say anything nasty about a book, I won't say anything at all.

(Continued next page)

It's 11 p.m.
**Do you know what
your expert system
just inferred?**

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SCEIO-86

**La Conférence Canadienne
d'Intelligence Artificielle
de 1986**

Montréal, 21—23 Mai

Do you review all the books that publishers send you?

No, because (a) we don't have enough people volunteering to review books, and (b) not all books we receive are of wide enough interest to our readership to warrant review.

And on the other hand, reviews aren't limited just to those books that publishers send us free copies of. We also invite readers to contribute reviews of books that they have read and think deserve mention (or which readers should be warned against).

How can readers help improve the magazine?

Firstly, by helping us with promotion. We are well-known in Canadian academia now, but there are still many people in industry we haven't reached. So I'd like people to tell their friends about us, and encourage them to subscribe.

Secondly, by writing and sending things. News items about new companies, people, projects, or the like are always welcome, along with book reviews, cartoons, tech report abstracts, and conference announcements. Opinion pieces are particularly welcome. And constructive criticism. And flattering letters. And any spare VAXes you may have lying around.

Thank you, Dr Hirst. You've certainly put my mind at rest.

You're welcome. □

New Bindings

Arthur Dempster, on leave from Harvard University at University of Toronto.

Mark Fox, on leave from Carnegie-Mellon University at University of Toronto.

Russell Greiner, from Stanford University to University of Toronto.

Armin Haken, from Jet Propulsion Laboratory, Pasadena to University of Toronto.

Jim Little, from University of British Columbia to Massachusetts Institute of Technology.

Fred Popowich, from Simon Fraser University to University of Edinburgh.

**Deadline for the
December Newsletter
is 15 November.**

**L'échéance pour le numéro
de décembre est le 15 novembre.**

Canadian
Artificial Intelligence
Numéro 5, septembre 1985

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Applications de l'Intelligence Artificielle en usine (Richard K. Miller). La *Revue québécoise de linguistique* a publié un numéro spécial au sujet de la linguistique et de l'informatique.

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Golden Common Lisp pour les IBM PCs, et RuleMaster, un outil de la deuxième génération pour le développement de systèmes d'expertise.

The Report Store, à part

L'IA: une bibliographie choisie.

John Wiley and Sons Canada Ltd, à part

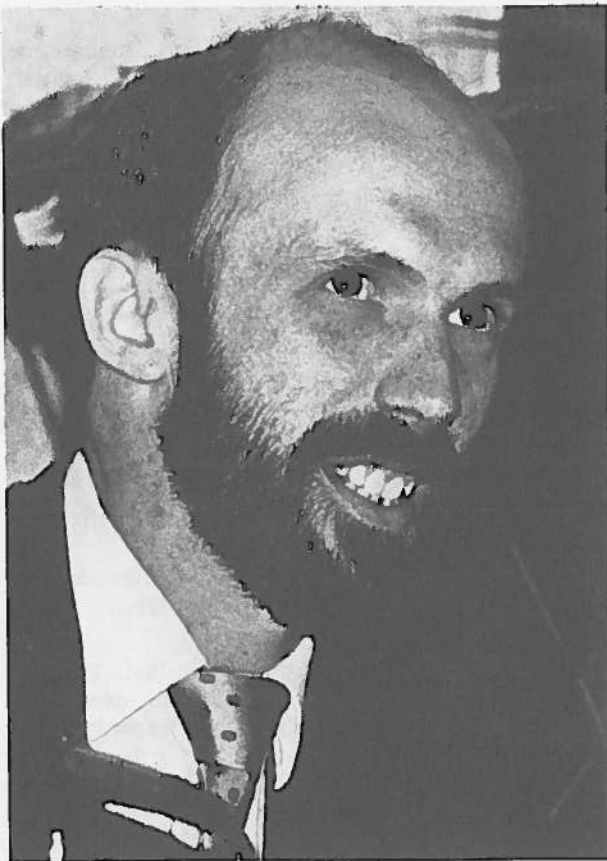
La série Ellis Horwood de livres au sujet de l'IA.

Canada Prominent in IJCAI Awards

Levesque Receives Computers and Thought Award

Hector Levesque of the University of Toronto has been named winner of the 1985 Computers and Thought Award, presented biennially by the International Joint Conference on Artificial Intelligence (IJCAI). The award, generally regarded as the most prestigious in AI, is presented to "an outstanding young scientist in the field". This is the first time a researcher outside the United States has won the award. The award was presented at the conference in Los Angeles last month.

Professor Levesque was nominated for his research on the fundamental issues of knowledge representation which can be broadly classified into three areas. First, the formal treatment of features of knowledge and belief; for example, the nature of incompleteness of knowledge.



UCLA INFORMATION SERVICES

Hector Levesque, winner of the Computers and Thought Award for outstanding research.

Second, the problem of expressiveness versus computational tractability, which involves the discovery of tradeoffs between the expressiveness of a representation language and the difficulty of reasoning correctly with the beliefs expressed in it. Third, the development of knowledge representation formalisms, and the design and implementation of KRYPTON, a knowledge representation system.

Traditionally, the award recipient gives a public lecture at IJCAI. Professor Levesque's lecture, entitled "Making believers out of computers", was extremely well received. The talk outlined how a theory of knowledge representation and reasoning based on logic and computability might shed some light on some fundamental questions about knowledge-based systems, and provide a foundation for understanding their nature and limits. Problems addressed included why it should be possible at all to construct systems that reason effectively about a domain; how the power of knowledge has been harnessed and controlled; and why exactly expert systems have not been blown away by combinatorial explosions.

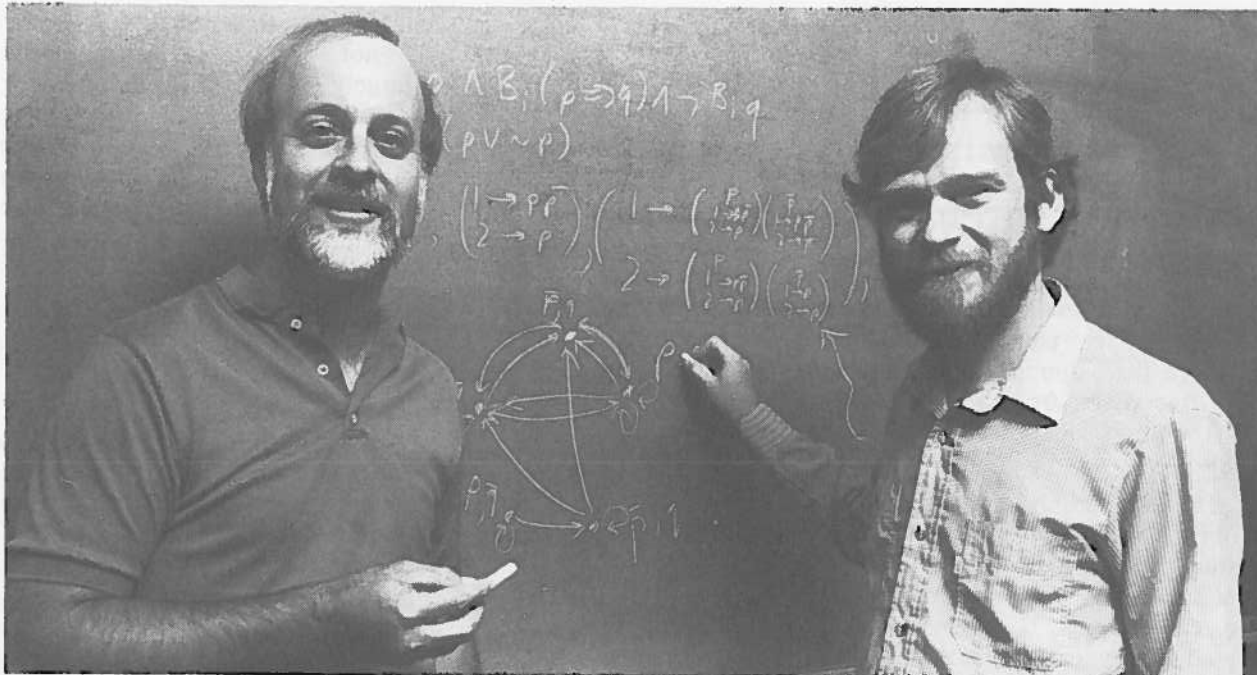
Professor Levesque, 34, received his BSc, MSc, and PhD degrees from the University of Toronto. He worked for three years at the Fairchild Laboratory for AI Research, in Palo Alto, California, before returning to U of T as a member of faculty last year. At last year's AAAI conference, he received two of the five prizes for best submitted paper, one shared with Ron Brachman, then of Fairchild. Professor Levesque is also a Fellow of the Canadian Institute of Advanced Research.

Best Paper Award to Fagin and Halpern

The winners of the Publisher's Prize for the best paper submitted to IJCAI were Ronald Fagin and Joseph Halpern of IBM San Jose Research Laboratory, for their paper "Belief, awareness, and limited reasoning". Dr Halpern is a Canadian who received his BSc degree from the University of Toronto, and his PhD from Harvard University.

The paper introduced new logics for belief and knowledge. These logics have the property that agents are not logically omniscient, and are thus more suitable than traditional logics for modelling beliefs. The first logic is an extension of Levesque's logic of implicit and explicit belief; the second logic deals explicitly with the concept of awareness; and the third models "local reasoning".

(Continued next page.)



IBM

Ronald Fagin and Joseph Halpern, winners of the Publisher's Prize for best paper.

John McCarthy Accepts Research Excellence Award

A new award at this year's IJCAI was the award for Research Excellence, honouring "sustained excellence in AI research". The recipient was John McCarthy of Stanford University.

Professor McCarthy is one of the founders of the field; it was he who coined the term *artificial intelligence*, and was one of the organizers of the 1956 Dartmouth conference, which is generally regarded as the point of commencement of AI as a distinct field of study. With Marvin Minsky, he was director of the AI Laboratory at the Massachusetts Institute of Technology from 1958 to 1962. In 1965, he founded the AI Laboratory at Stanford University, which he directed until 1980.

In 1957, Professor McCarthy made the first proposals for time-sharing computers, and in 1958 invented the AI programming language LISP. Other research areas in which he has made fundamental and substantial contributions are proving properties of programs, the logical foundations of AI, and circumscription and non-monotonic reasoning.

Goebel Stumps Band, Wins Dinner

Another Canadian prize-winner at IJCAI was Professor Randy Goebel of the University of Waterloo.

While in Los Angeles for the conference, he

and some other Canadian AI researchers from Waterloo and Saskatchewan attended a taping of a well-known television programme, *The Tonight Show*. The programme's host, Mr Johnny Carson, selected Professor Goebel from the audience to try to stump the band, a task in which he was successful with the song "Intergalactic Laxative". In return for singing this song on the show, he received a voucher for a \$100 dinner for four at a nearby restaurant.

Professor Goebel, who mentioned IJCAI while talking on air to Mr Carson, was said to have been seen by some tens of millions of viewers, compared to the estimated 3000 who attended Hector Levesque's Computers and Thought lecture; he was recognized by several people on the streets of Santa Monica the next day, whereas Professor Levesque was not. □



VIDEOTAPE EXTRACT BY DAVE FORSEY AND ALAN FAETH, UNIVERSITY OF WATERLOO COMPUTER GRAPHICS LAB

Randy Goebel, winner of a dinner for four for singing "Intergalactic Laxative", with Johnny Carson.

NSERC Proposes Major Increase in Research Funding

The Natural Sciences and Engineering Research Council of Canada (NSERC) has released its second five-year plan, which asks the government to more than double its annual budget over the next five years, from \$311 million in 1984-85 to \$703 million (measured in constant dollars) in 1989-90.

The plan emphasizes the need for Canada to move from an economy dependent on natural resources to one based on "the intellectual ability of Canadians". In a statement, the President of the Council, Dr Gordon MacNabb, said that Canadian governments and industry are desperate for the excellent research talent existing in the Canadian university system, but the system is already stretched to the breaking point with heavy teaching loads and inadequate research facilities. The Council believes that the program it is proposing in the plan is prerequisite to the attainment of any R&D progress in Canada.

Dr MacNabb said in the statement that the Council is well aware that it is releasing its plan during a period of fiscal restraint, but the Council had no choice but to analyse the needs and recommend effective programs to meet them.

The shortage of skilled researchers (see *Canadian A. I.*, June 1985) will prevent Canada reaching the goal of spending 2.5% of its gross national product on R&D by 1990; indeed, a target of 1.5%, originally set for 1983, will only be reached by 1990 with great difficulty, said the plan.

The Council's plan proposes the largest component of the increased spending to go to equipment and infrastructure grants; the present level of \$33 million a year would be increased to \$150 a year (in constant dollars) by 1989-90. Operating grants, which now average \$21,850 a year across all disciplines (and only \$18,240 in computer and information science) would be increased to an average of \$35,600. The Council believes that this is still only about half of what is minimally necessary.

The plan proposes doubling by 1990 the number of NSERC undergraduate student research awards to 4900, and increasing the number of postgraduate scholarships from 2600 to 3700.

The Council believes that its first five-year plan, although not funded to the extent requested, was largely successful in commencing the recovery of Canada's R&D effort; the Council's second plan is intended to complete the first plan, consolidate the gains, many of which would otherwise be lost again, and continue the recovery.

The plan is presently before Cabinet.

But Science Council Budget Is Cut

Not long after NSERC's plan was released, the government confirmed that it had halved the budget of the Science Council of Canada, from \$4.9 million to \$2.5 million. Nearly half its staff will be laid off by next April.

The Science Council is an independent government body, set up in 1966, to advise the government on science policy, to increase public awareness of issues in science and technology, and to encourage dialogue between government, industry, and universities on the development and use of science and technology.

The Minister of State for Science and Technology, Dr Thomas Siddon, said in a statement that the Science Council would, however, be consulted more often on scientific matters of national importance.

R&D Incentives

Dr Siddon also released a booklet explaining the government's new industrial R&D incentives that were first outlined in the May budget. These included the following:

The definition of "scientific research" in the Income Tax Act has been broadened to include "experimental development", and rules allowing tax claims for companies engaged in R&D have been relaxed so that all expenditures directly attributable to R&D may be claimed.

To encourage small firms, especially start-ups, to engage in R&D, the full 35% tax credit (up to \$700,000) earned for R&D will be directly and immediately refundable.

In addition, the budget is said to increase the availability of investment capital. A new personal capital gains tax exemption, up to a \$500,000 in a lifetime, was introduced. Registered retirement savings plans (RRSPs) will be permitted to invest up to 50% of their assets in arms-length Canadian-controlled private companies. Pension funds will be allowed to invest in small and medium-sized Canadian businesses.

The budget eliminated the earlier scientific research tax credit system, which permitted the sale of R&D tax credits. This system had been widely criticized as ineffective. □

Michel Pilote Starts Own Firm

Dr Michel Pilote, formerly of Emerald City Research, has started his own AI consulting service. Dr Pilote will be also be offering seminars emphasizing the application of AI in business and government. He is particularly concerned with the integration of AI techniques with more traditional methods in data processing and office automation.

Dr Pilote has a PhD in AI from the University of Toronto, and over ten years of industrial experience. Fluently bilingual, he is one of the few consultants in Canada to offer his services and courses in French as well as English.

Dr Pilote may be contacted at 45 Carlton Street, Suite 715, Toronto, Ont., M5B 2H9; phone 416-597-0881.

Coast Mountain Intelligence Specializes in Resource Applications

Coast Mountain Intelligence Ltd. is the new name for Dogwood AI Ltd. The British Columbia-based consulting firm, headed by Dr Peter Rowat, specializes in resource-management applications of AI.

The company presently has an R&D project aimed at producing an expert system for forest management, and another developing an expert system for the interpretation of snow profiles for avalanche predictions. The company recently completed an expert system that gives advice on choosing statistical packages for the analysis of geophysical data.

The company also offers consulting and programming services in general AI.

Dr Rowat received his PhD in AI from the University of British Columbia in 1979.

Coast Mountain Intelligence can be contacted at 1826 West 1st Avenue, Vancouver, BC, V6J 1G5; phone 604-734-1901.

P. S. Mueller



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LPA micro-PROLOG professional

LPA micro-PROLOG professional is a new powerful version of micro-PROLOG with its own window handling primitives and "Wordstar-like" screen editor. With "Macintosh-style" menus and windows, LPA micro-PROLOG professional is fully intergrated with the MS-DOS 2 environment using all the memory available.

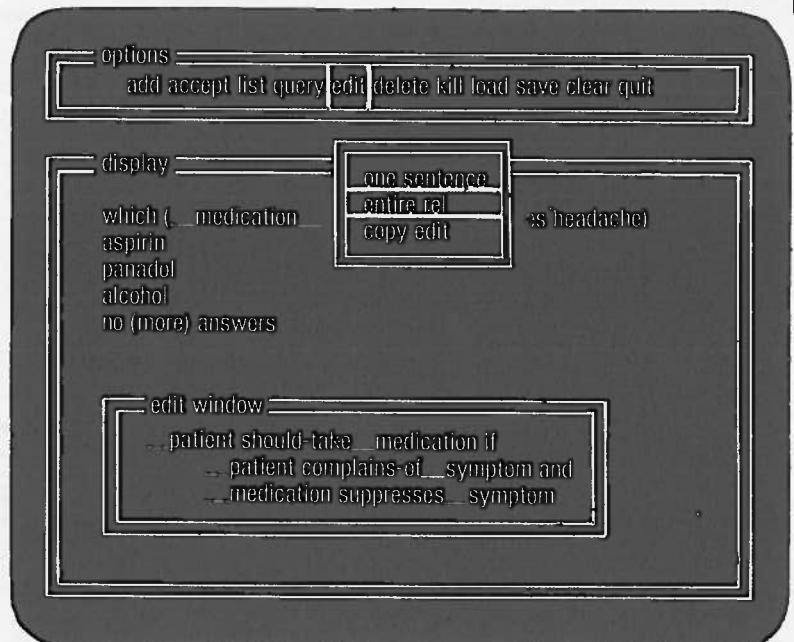
LPA sigma-PROLOG

LPA sigma-PROLOG is the version of PROLOG tailored to UNIX. Like UNIX, LPA sigma-PROLOG has a coherent design philosohy. This provides:

- * an elegant and expressive core syntax
- * a choice of user friendly syntaxes
- * a wide range of predefined facilites including file handling, string and chracter manipulation and logical operations
- * the power to create and communication with existing UNIX commands and utilities
- * the ability to write and to include new facilities into the language

LPA Mac PROLOG

LPA Mac PROLOG is the Version of PROLOG implemented for Apple Macintosh computers, This implemen- tation is an incremental compiler fully compatible with the Macintosh window and mouse philosophy.



LPA PROLOG Compiler is being developed, and will be available soon.

Expert system shell

apes: An augumented prolog for expert systems

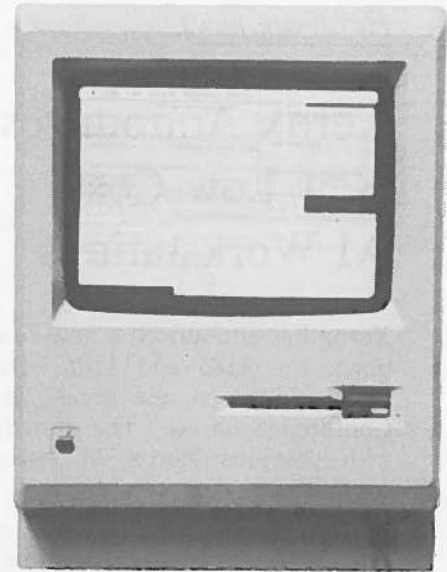
apes is an effective logic programming and Expert System construction tool which runs on LPA PROLOG. Features of PROLOG may be accessed from within **apes** for sophisticated programming. A simple Natural Language facility enhances the robustness of application. **apes** has been successfully applied in various AI projects in the world including Expert Systems in the domains of Geology, Law, Biochemistry, Medicine, and Engineering.



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Telephone: (613) 592-0084

An Expert System development kit including:
LPA micro-PROLOG professional, apes, LPA micro-
PROLOG Reference manual, apes manual, introductory
logic programming text book "micro-PROLOG: Program-
ming in Logic", by Clark & McCabe; available for
\$975.00 + tax.



Example Knowledge Bases for apes

An easy way to build first Expert Systems

Applied AI offers coded knowledge bases for
building text Expert Systems using apes shell.
They can be used for:

- 1) Self-teaching on how to build apes-based
Expert Systems through study and modifi-
cation of examples (Source files supplied),
- 2) Demonstrating Expert Systems to others,
- 3) Redesigning and expanding examples into
practical applications.

BANAL (apesEX-001, Price:\$65 + tax): Barbaric Aspects of Negotiating Academic
Life, a light-hearted Expert System to determine a student's success/failure
potential in university/college life. About 90 rules.

TaxExpert (apesEX-002, Price: \$95 + tax): Assesses liability for income tax
and then calculates it based on information gathered from the user. Simplified
assessment rules but most important programming techniques for apes exercised.
Demonstrates how a typical consultation Expert System may be constructed.

Knowledge bases are shipped with machine-readable documentation on a 5-1/4",
MS-DOS format diskette. System requirements: apes Expert System shell running
on either micro-PROLOG or sigma-PROLOG. Minimum total RAM 128 KBytes.

For additional information, call or write Applied AI Systems Inc.

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Xerox Announces New Low-Cost AI Workstations

Xerox has announced a new series of AI workstations, the 1185 and 1186. Both systems were demonstrated at the recent International Joint Conference on AI. The systems are compatible with previous Xerox AI workstations, but are considerably cheaper.

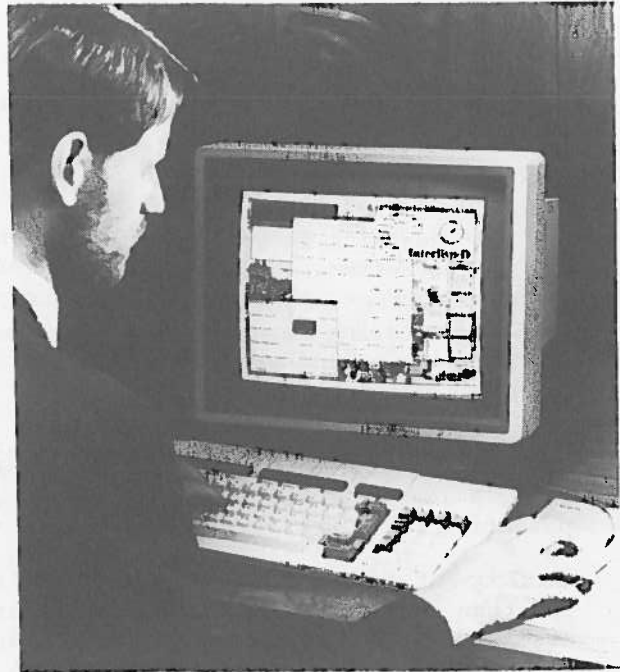
The 1185, the smaller of the two systems, is intended as a "delivery vehicle" for commercial applications. The larger, the 1186, is for system development.

The systems incorporate Xerox's new 6000 series of processors. An option on both systems is a co-processor that can run software for the IBM PC; the PC environment and the regular Xerox Interlisp-D environment can be run and windowed simultaneously.

Delivery of the systems starts immediately in the U.S., and early next year in Canada.

Other products announced by Xerox include the following:

- Common Lisp. Xerox will continue to support Interlisp-D as well, and extend it with many features of Common Lisp.
- Quintus Prolog, a Prolog system that runs in the Xerox AI environment.
- Busmaster, a hardware and software package that allows Xerox 1108 AI workstations to interface with IBM PC-, IEEE 488-, and Multibus-compatible peripherals.
- A new laser printer, the 4045, that can connect directly to a workstation. The resolution is 300 dots per inch.
- The Notecards-D software package, a system for sketching out and organizing ideas.
- An improved workstation console, which will be used not only on the 1185 and 1186, but also from now on in the existing 1108 series. An improved mouse is included.
- The Xerox 1108-105T, a version of the 1108 AI workstation for secure government installations in which the emission of detectable radio frequency signals is undesirable.



The console of the new Xerox 1185 and 1186 workstations is not dissimilar to that of many other high-resolution bit-mapped consoles. In this photograph, kindly made available by Xerox, the windows on the screen appear to include an airline operations record, a short budget, a clock showing nine minutes past one o'clock; a status line giving the time as 09:31:12, a half-tone picture, the Interlisp-D logo, and some other things too blurry to make out. The unidentified operator is typing with his left hand while mousing with the right. The palm tree just visible in the background is not part of the system.

Renewal notices

Because CIPS handles administration for CSCSI/SCEIO, our renewal notices are printed on standard CIPS invoice forms. Don't let this confuse you — if you aren't also a CIPS member, you won't be slyly billed for a CIPS membership you didn't ask for.

Theoretical Approaches to Natural Language Understanding

Graeme Hirst
Department of Computer Science
University of Toronto

The workshop on Theoretical Approaches to Natural Language Understanding, sponsored by CSCSI/SCEIO at Dalhousie University in May, was a great success.

The workshop was attended by about 80 researchers in natural language understanding. This proved to be the right size for promoting extensive discussion on the various controversies selected by the organizers and invited speakers as current issues in the field. There were sufficient people present to ensure many points of view, but the meeting was small and friendly enough that there were few inhibitions among the speakers and audience in expressing opinions.

Attendees were from Canada, the U.S., and Europe, with a good balance among the countries. The workshop achieved the aim of being a Canadian-hosted international meeting, rather than just a parochial Canadian meeting.

The workshop was divided into Grammar Day, Semantics Day, and Knowledge Representation Day. The organizers of each day gave an overview of the sub-field and current issues, and then presented several invited speakers to address the issues. There were also some submitted papers. Ample time was allowed for questions and discussion.

The Workshop Program

Below is a capsule summary, prepared by Fred Popowich of Simon Fraser University, of each of the papers presented at the workshop. Many of the papers appear in the workshop's *Pre-proceedings*, copies of which can be obtained for \$CDN10 from either the general chairman or program chairman of the workshop:

Richard Rosenberg
Department of Math and Computing Science
Dalhousie University

Halifax, NS, CANADA B3H 4H8

Nick Cercone
School of Computing Science
Simon Fraser University
Burnaby, BC, CANADA V5A 1S6

A supplement to the *Pre-proceedings*, containing most of the remaining papers, is also forthcoming, and selected papers will appear in a special issue of *Computational Intelligence*.

Grammar Day

Len Schubert and Veronica Dahl, organizers

Len Schubert (Introduction):

"Overview of theoretical and computational linguistics"

Ron Kaplan (Invited Speaker):

"Lexical Functional Grammar vs. Logic Grammars"

Some differences between lexical functional grammars and logic grammars were highlighted. In particular, the *intermediate structures* between the word string and the "logic form" were examined.

Dan Flickinger (Invited Speaker):

"Using the Head in Natural Language Processing"

The author argued that the lexicon should be the central store of information in a natural language system. Using a framework from generalized phrase structure grammars, a system was outlined where lexical rules are used in lieu of metarules.

Mitch Marcus and Don Hindle (Invited Speaker):

"Time is of the Essence"

It was noted that speakers often change their minds during the utterance of a sentence. A system was presented which parses sentences that may contain restarts, fragments, and ungrammatical usage.

Mike Maxwell (Submitted Paper):

"On Double Slash Categories in GPSG"

The author proposed an analysis of tough-movement constructions that does not require double slash categories.

Fred Popowich (Submitted Paper):

"Unrestricted Gapping Grammars for ID/LP Grammars"

A simple procedure for converting ID/LP grammars into unrestricted gapping grammars for direct processing was outlined.

Veronica Dahl (Introduction):

"Overview of Logic-Based Meta-Grammars"

Patrick Saint-Dizier (Invited Speaker):

"Logic-Based Grammars: a framework to describe linguistic theories"

The author examined the use of logic grammars, in particular gapping grammars, for description of movement allowed by linguistic theories (such as in government-binding). Their use in semantics was also discussed.

Fernando Pereira (Invited Speaker):

"Deductive Computation of Grammar Properties"

A method was presented which uses tables of properties deduced from the grammar for improved performance of definite clause grammar parsers.

Harvey Abramson, Veronica Dahl, Lynette Hirschman, Fernando Pereira (Panel Discussion):

The panel members discussed the definitions of logic-based metagrammars and logic grammars. They also argued about the advantages and disadvantages of the logic grammar formalisms.

Semantics Day

Graeme Hirst and David Israel, organizers

Graeme Hirst (Introduction): "Overview of Montague Semantics"

David Israel (Introduction): "A look at Situation Semantics"

Per-Kristian Halvorsen (Invited Speaker):

"Why I like Montague Semantics, and what they have for Natural Language Understanding"

A general discussion of intensional logic and possible worlds, and their application to unrestricted English.

Robin Cooper (Invited Speaker):

"Meaning Representation in Montague Grammar and Situation Semantics"

The author compared the meaning representations of Montague grammars and situation semantics, and discussed research toward a computationally useful representation of situation semantic constructs.

Bill Woods (Invited Speaker):

The author discussed the importance of knowledge representation, using examples from KL-One and its successors.

David Scott Warren (Invited Speaker):

"Montague Grammar and Natural Language Understanding"

An architecture for a natural language system that uses Montague semantics was outlined.

Yves Lespérance (Invited Speaker):

"Toward a Computational Implementation of Situation Semantics"

A discussion of the problems of using situation semantics in a computational system.

Robin Cooper, Per-Kristian Halvorsen, David Israel, Yves Lespérance, David Scott Warren (Panel Session):

The panel members discussed merits and differences of Montague semantics and situation semantics.

Knowledge Representation Day

James Allen and Ralph Weischedel, organizers

Ralph Weischedel (Introduction):

"Overview of Knowledge Representation"

Candy Sidner (Invited Speaker):

"Plan Parsing for Intended Response Recognition in Discourse"

The author addressed the questions of how one represents plans and how one uses them. NIKL and the KL-Two system were examined. A framework for discourse theory was also presented.

Stan Rosenchein (Invited Speaker):

"Knowledge and Action in Situated Automaton"

Issues of knowledge arise in the study of communication between multiple agents or processes. The author discussed an architecture for mutual belief.

Bill Mark (Invited Speaker):

"Special Purpose Reasoning in the Consul System"

The question of how one designs a knowledge based system was addressed, with the Consul system used as an example.

Eric Mays (Invited Speaker):

"Some Conditions on Providing a Class of Extended Responses"

The author examined the use of a modal temporal logic in a database system, and demonstrated how this logic might be used to obtain extended responses.

Chuck Rich (Invited Speaker):

"Hybrid Knowledge Representation and Reasoning Systems"

The author discussed the design and merits of a hybrid system. The systems discussed included Krypton, CAKE, and KL-Two.

David Touretzky (Invited Speaker):

"Inheritable Relations: A Logical Extension to Inheritance Hierarchies"

A representation for inheritable relations was proposed that handles negations, exceptions, multiple inheritance, and many-valued relations.

F. Gomez (Submitted Paper):

"A Model of Comprehension of Elementary Scientific Texts"

The system described by the author is based on the decomposition of an expository text into explanatory and descriptive components, and on the use of "explanatory links" to connect sentences.

Advertising in *Canadian A. I.*

An advertisement in *Canadian A. I.* reaches CSCSI/SCEIO's 650 (and rapidly growing) members in the AI R&D community, and also key people in the Canadian media and federal and provincial governments. Total print of this issue: 1000 copies.

Workshop on the Foundations of Adaptive Information Processing

Vijay Raghavan
Department of Computer Science
University of Regina

A workshop on the Foundations Of Adaptive Information Processing was held on 10–11 June 1985 at the University of Regina. It was sponsored by the Faculty of Graduate Studies and Research and the Computer Science Department of the university.

The impetus for the workshop came as result of the following:

- i. There has been a great surge of interest in the recent years on investigating research progress in AI and its implications for computer science research in general.
- ii. In a number of sub-disciplines of computer science such as information retrieval, pattern recognition, expert systems, and decision support, there is a striking similarity in the manner in which the problems of interest are formulated.
- iii. There are several faculty members in the Computer Science Department at University of Regina whose research interests overlap information retrieval, AI, expert systems and so on.
- iv. The ACM SIGIR annual conference was in Montreal in the first week of June, and several individuals coming to that conference had expressed a desire to visit University of Regina, and
- v. The dean of the Graduate Studies and Research faculty was enthusiastic in providing financial support for this venture.

The total attendance at the workshop was 20, including faculty members and graduate students of the department and eight guests who agreed to participate upon invitation. There were, in all, twelve presentations each approximately forty minutes. Four of the presentations were by faculty members of the department. There was

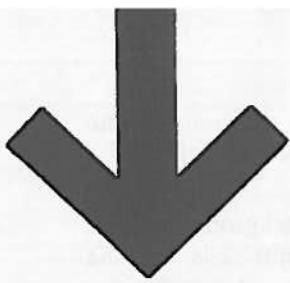
ample opportunity for informal discussions and exchange of ideas. This contributed greatly to the success of the workshop.

The participants had varied backgrounds. This was in line with the main emphasis of the workshop, which was to compare and contrast the various problem formulations in the disciplines represented by the participants and to discuss models and theoretical foundations upon which solutions to these problems are based. Following is a list of individuals who participated and the titles of their presentations.

- D. Kraft, (Louisiana State University):
"Research into fuzzy extensions of information retrieval."
- A. Bookstein, (University of Chicago):
"Problems of introducing a Boolean structure into probabilistic retrieval."
- T. Radecki, (Louisiana State University and Technical University of Wroclaw):
"Adaptive Boolean information retrieval."
- L. Goldfarb, (University of New Brunswick):
"On metric data models and associated search strategies."
- M. Wong, (University of Regina):
"A unified model for information retrieval."
- M. Gordon, (University of Michigan):
"Effectiveness of genetic algorithm for document redescription."
- L.A. Rendell, (University of Illinois at Urbana-Champaign):
"Cluster analysis and genetic algorithm in machine learning."
- M. Janta-Polczynski, (University of Regina):
"A system for detecting 'deep' and 'shallow' concepts in simple definitions."
- W. Ziarko, (University of Regina):
"A concept-learning information retrieval system: Basic ideas."
- J.S. Deogun, (University of Nebraska-Lincoln):
"A generalized retrieval facility for management decision support."
- P. Bollmann, (Technical University of Berlin):
"Two axioms for performance evaluation of information retrieval systems."
- V.V. Raghavan, (University of Regina):
"Some thoughts on adaptive clustering for information retrieval."

Dr Jeff Sampson of the University of Alberta was to have given a presentation entitled "Genetic algorithms: A class of adaptive search procedures", but to our great disappointment and deep sorrow, we learned that he passed away a week earlier, while travelling in France.

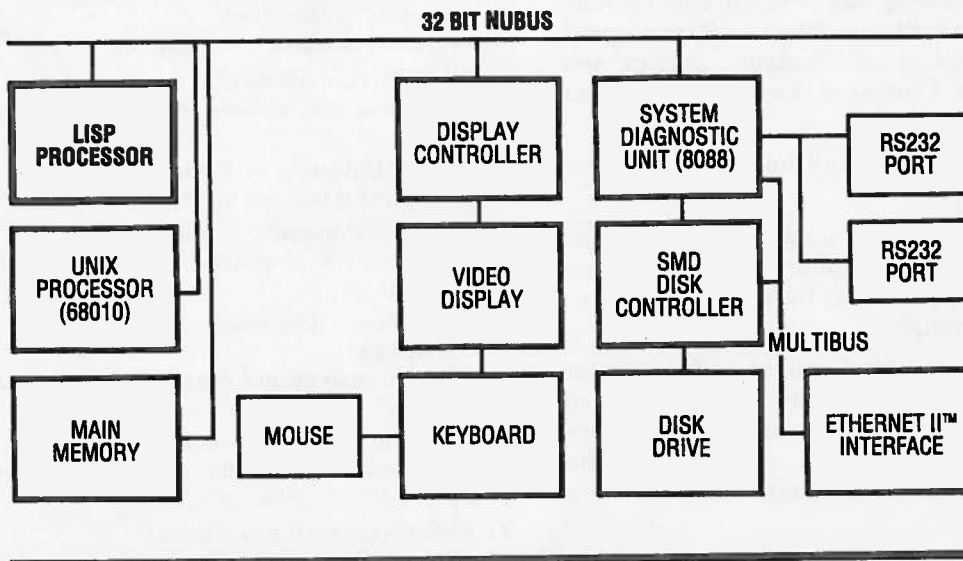
The proceedings of the workshop will be published in the near future, and a summary of the presentations will appear in *SIGIR Forum*. □



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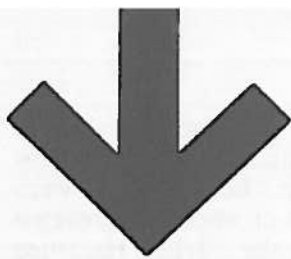
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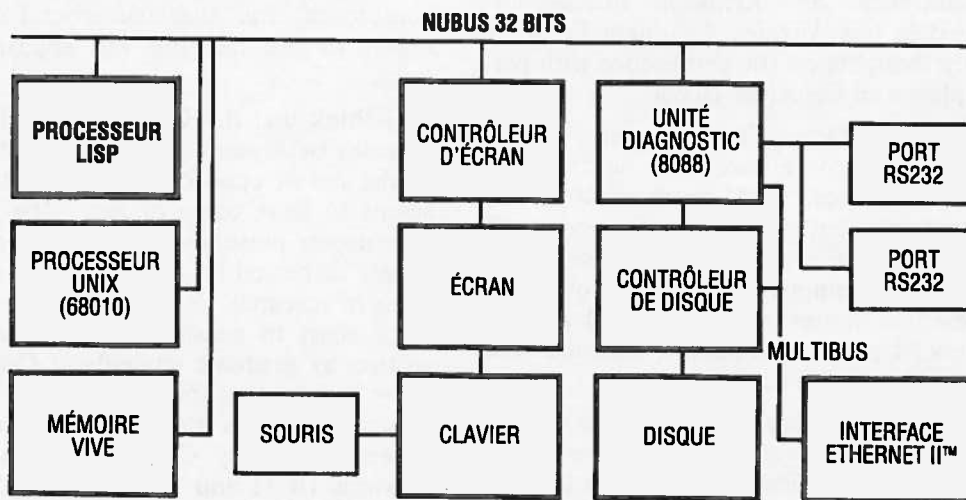
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Canada Conquers Los Angeles

Gord McCalla
President, CSCSI/SCEIO

Having just returned from the Ninth International Joint Conference on Artificial Intelligence, recently held in Los Angeles, I thought I'd share some of my thoughts on the conference with particular emphasis on Canadian aspects.

First some raw facts. The conference was by far the biggest AI conference ever held. There were 4800 attendees, and another 400 who attended tutorials, but not the conference itself. It was held in ideal weather conditions on the very posh UCLA campus. There were over 200 papers presented representing over 400 authors and speakers. Up to seven parallel sessions were needed to squeeze everybody in.

Canada had a very high profile at the conference. Of course, the whole shebang was under the direction of Alan Mackworth (of the University of British Columbia), general chairman of the conference. As if this didn't give Canada enough claim on the conference, Hector Levesque of the University of Toronto won the Computers and Thought Award (see page 8). The night of Hector's public presentation was singularly Canadian. Not only was Hector the first Canadian to win this prestigious award (in fact the first person not at an American university), but he was introduced by Alan Mackworth, who explained the history behind the award, and by John Mylopoulos (also of U of T) who summarized Hector's illustrious career. It will come as no surprise that Hector gave one of the best talks in the history of this award. The talk was both humorous and serious, both speculative and firmly based on existing research, and aimed at various levels throughout so that everybody in the audience, from the lay public through to AI experts, could benefit from his insights.

Perusing the *Proceedings* of the conference, I counted around a dozen papers written by researchers currently at Canadian research establishments, and another dozen or so written by

expatriate Canadians. In addition there were many other Canadians acting as session chairpeople, referees, panelists, etc. Finally, there were the Canadian masses, most of whom congregated at one time or another at the "J-12" residence suite at which the University of Waterloo contingent (for other exploits of which see page 9) hosted what seemed to be a continuous party for the entire four days of the conference. Certainly, we had to be world-class revellers!

Other Canadian influences included the *Computational Intelligence* booth in the exhibit area, which not only advertised the new NRCC sponsored journal, but also acted as a staging area for advertisements for other Canadian endeavours such as *Canadian A. I.*, and next year's Canadian AI Conference. As well, the annual general meeting of the CSCSI/SCEIO was held at the conference, and attracted around 50 people. A report of the meeting will appear in the next issue.

I think that the Canadian activities at the Los Angeles IJCAI, and our other activities mentioned in the report opposite, indicate that Canadian AI seems to have come of age. The various Canadian papers presented at the IJCAI conference are widely dispersed both geographically, and in their areas of research. It appears that good AI is being done coast to coast. Many of the papers were written by graduate students at Canadian universities, a good sign for the vigour of our university programmes. As the number of award-winning papers written by Canadians at this IJCAI (and previous IJCAI and AAI conferences) indicate, we are producing people who not only do good research, but who also can elucidate it clearly. Congratulations to all involved with IJCAI — we meet again in Montreal next May.

Finally let me conclude on a sadder note. The Canadian AI community has recently lost a number of outstanding researchers and scholars. Don Kuehner and Julian Davies (of the University of Western Ontario), Jeff Sampson (of the University of Alberta), and Danny Berlin (a Canadian graduate student at Stanford) have passed away; obituaries appear elsewhere in this issue. I am sure that the entire membership of CSCSI/SCEIO will join with me in offering deepest sympathies to their loved ones. They will be impossible to replace, and those of us who knew them will miss them. □

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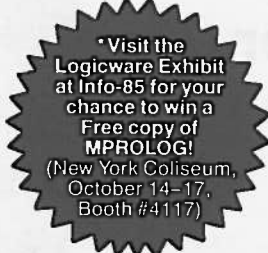
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Seminar Agenda

8:30 – 9:00 am Registration

9:00 – Noon "An Introduction to Logic Programming and Knowledge Based Expert Systems"
Using simple case studies, we'll demonstrate some of the many lucrative applications of Logic Programming. Learn about MPROLOG, a portable, user-friendly version of the language endorsed by Japan's 5th Generation Computer Project and many multi-national corporations to bring Expert Systems on-line. You will also discover how MPROLOG can be utilized to implement Explanation Systems, Natural Language applications and Rapid Prototyping through Logic Programming. The seminar will conclude with suggested strategies for getting on the road to dramatic increases in performance and productivity.



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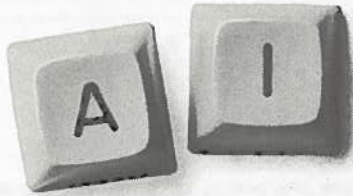
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- Multiprocessing capacity
- Support of an extensible, interpreted language
- Display-oriented programming tools
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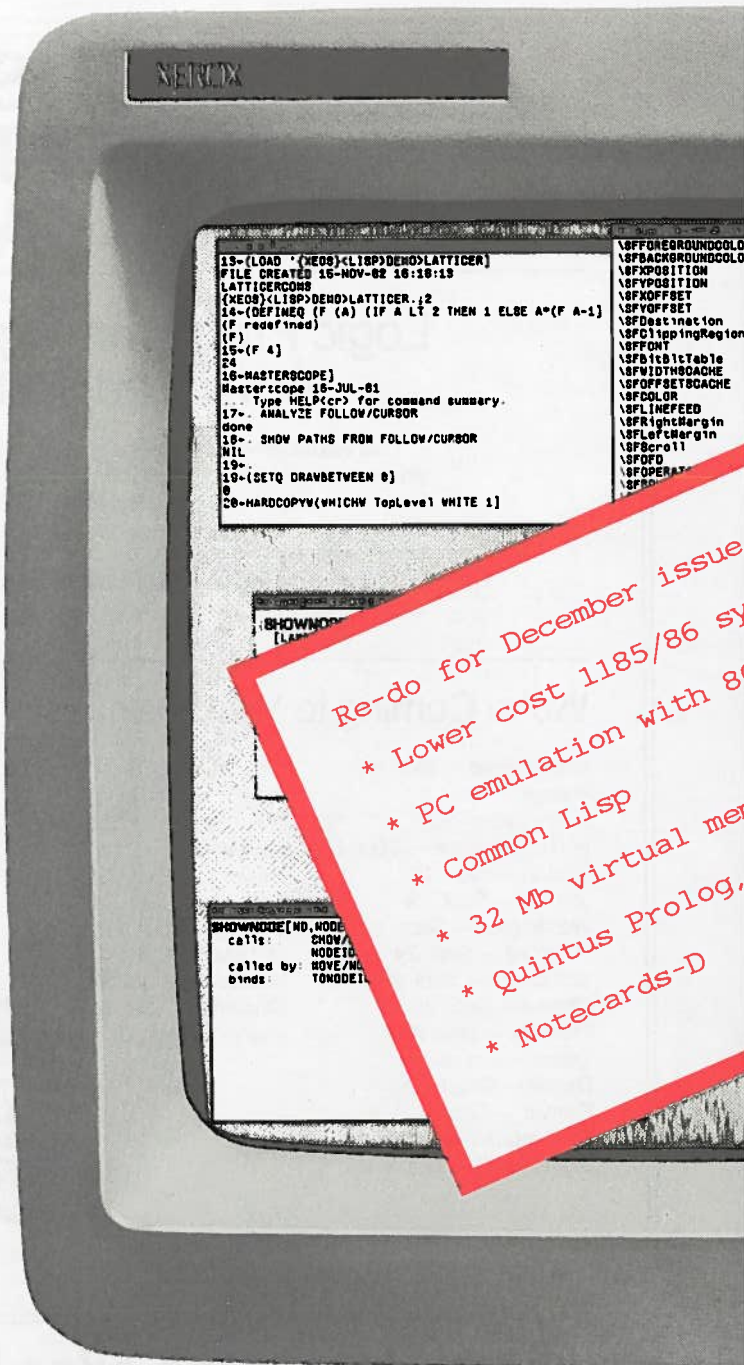
Power Tools for Programmers

1. Display Editor and Inspector

The display-based structure editor allows the interactive editing of programs and other list data. Structure-based editing exploits the form of an object, emphasizes the meaning of its parts, and thus reduces errors. The data inspector extends the philosophy to both system and user data types, allowing easy inspection and modification of any object in the system.

2. Programmer's Assistant

The Programmer's Assistant provides an intelligent assistant and bookkeeper that frees the programmer from much mundane detail. The Programmer's Assistant includes an error analysis capability and also monitors and records all user inputs. For example, a history is kept of the commands typed, their side-effects, and the results. Thus, one can request that a previous command or sequence of commands be repeated, modified and then repeated, or even undone (which undoes all the changes it may have caused). Also

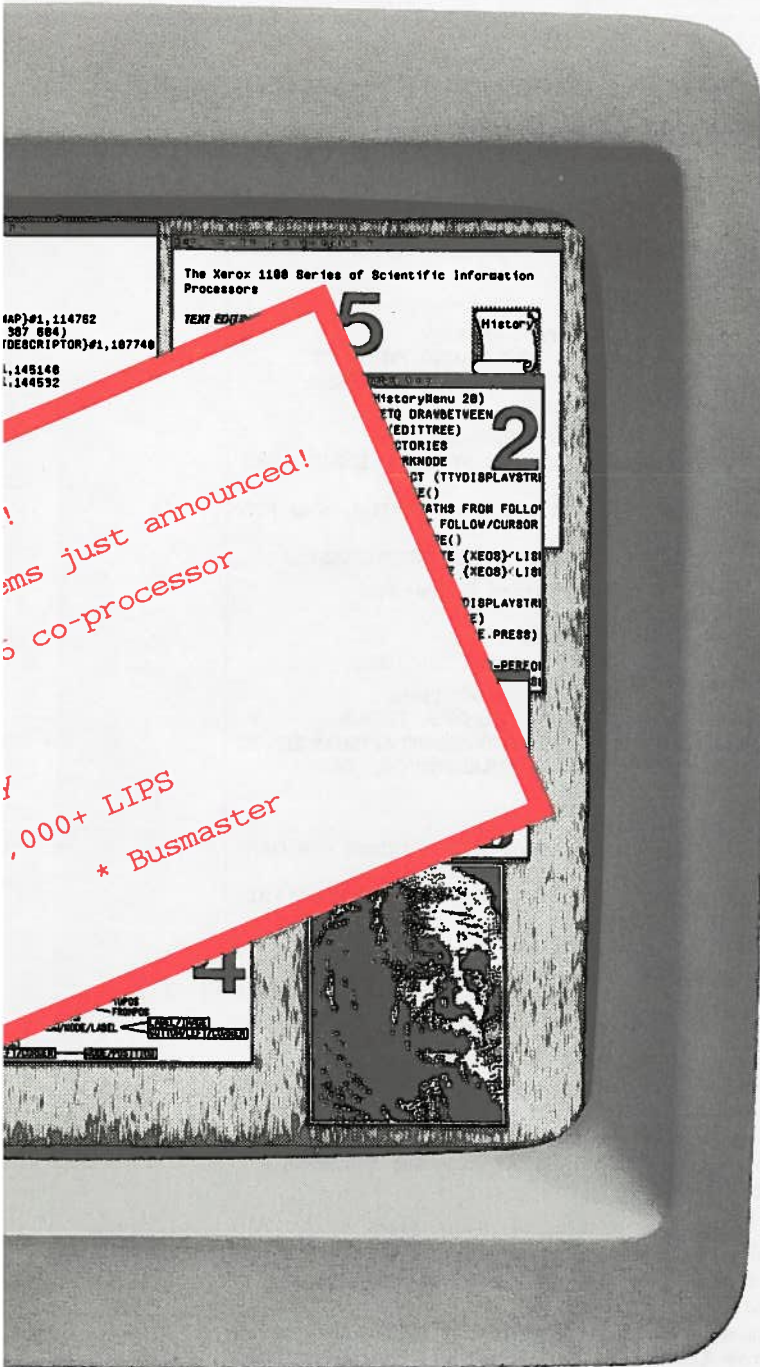


provided is a spelling corrector that automatically corrects spelling mistakes using information from the local context. To simplify file management for the programmer, Interlisp-D automatically keeps track of where in the file system each object is stored and which ones have been modified. In response to a simple request, the system can therefore save the user's state, updating all changed files automatically. The Programmer's Assistant provides a programming environment which cooperates in the development of programs allowing the user to concentrate on higher level design issues.

3. Debugging Tools

Debugging tools allow the user to break and trace

XEROX



the program's structure and assist in the process of making modifications automatically. Because Masterscope is interfaced with the file package and editor, it re-analyzes a program whenever it is modified. Information about program calling structure, variable and data structure usage, and side effects can be graphically displayed and used to provide a map or browser for the system. The same information can be used to make systematic changes automatically. Further, Interlisp-D's measurement tools can be used to analyze the behavior of a system after it has been developed to pinpoint those areas that may need improvement.

5. A Professional Workstation

A high bandwidth user interface is provided by combining the mouse and the high resolution display. The mouse permits the user to specify and manipulate positions or regions on the screen. The interactive display facilities include complete raster graphic functions as well as a display management system supporting multiple overlapping windows, menu driven selection of operations, and a wide range of built-in graphical abstractions. Functions are also provided to display text in multiple fonts, manipulate raster images, and draw spline curves. The large format, high resolution display and the sophisticated multiple window system allow concurrent sessions, close-up views, and simultaneous displays of multiple representations of complex data. It is easy to create windows with text, graphics, or both and to make them scroll, update and interact in useful ways with the end user.

6. Knowledge Programming System (Optional)

LOOPS extends the programming environment to provide a powerful tool for research and expert system development. LOOPS combines four programming styles:

- Procedure-Oriented
- Data-Oriented
- Object-Oriented
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arbitrary functions, and examine the state of the machine at any desired level of detail. Not only can the state of a suspended computation be displayed and perused graphically, but it can be manually unwound to a specified point, the offending program edited, and execution resumed, all without loss of state. Also included is the capability of specifying complex, user-defined intervention conditions, such as allowing breaks only when a given function is called from another given function. These debugging tools allow bugs to be tracked down quickly and easily.

4. Program Analysis

The Masterscope facility can analyze a user's program and use that information to answer questions, display

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BUSINESS PEOPLE

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A presentation on:

THE ROLE OF AI IN BUSINESS

The spectacular achievements in the field of Artificial Intelligence are not magical, and the tools and methodologies used to produce them could also be applied in current business environments.

We will introduce you to the practical aspects of Artificial Intelligence. We will first investigate the areas of AI which are commonly considered of most immediate commercial value. We will also summarize our experience in using AI for prototyping Integrated Office Systems software and user interfaces. We will reveal some insights out of this practical work about the imminent coupling of AI, Office Automation and 4th Generation technologies. Our main goal is to leave you with enough understanding of AI that you will be able to identify how these ideas could help you solve some of your immediate problems.

We will take an unusual look at the three AI markets that are most relevant for today's business: Natural Language processing, Expert Systems, and Computer-Aided Instruction (which is just around the corner!). We will explain the essential AI techniques underlying these domains by comparing real examples of each with corresponding data processing practice.

AI tools have recently been recognized as very effective to facilitate the design of complex non-AI business applications. We will show how these tools permit to rapidly construct some prototypes of the entire functionality of a desired system. These models can easily and quickly be modified to answer feedback from users trying them in real situations.

We have applied these tools very successfully to allow end-users to direct the prototyping of Office Automation software. This process led to some interesting observations. The first is that the "AI way of doing things" is in fact very similar to the way in which business people address and resolve their problems. Both methods are very different from the "traditional" data processing ones. Because of this likeness, AI notions are picked up surprisingly fast by these users. Finally, while we expected our initial efforts to bring us into natural language front ends and systems able to explain themselves, of the "expert system" type, what in fact surfaced is a much more critical need to manage the complexity of a computerized environment. The AI field is particularly rich in solutions for this challenge.

The biggest bottleneck for a data processing person who wants to find out about AI is getting familiar with these new concepts. AI offers a wide variety of tools, which are invariably described in a unique and very obscure terminology. We will present an original way in which you can get acquainted with the appropriate AI tools and approaches, and quickly use them to reach impressive results.

Introduction

- WHY IS ARTIFICIAL INTELLIGENCE IMPORTANT?
- WHAT IS AI?
- MAIN AI MARKETS;

Natural Language

- STATE-OF-THE-ART IN COMMERCIAL PRODUCTS;
- STRUCTURE OF NATURAL LANGUAGE SYSTEMS;
- CAVEATS AND GUIDELINES;

Expert Systems

- DEFINITION AND EXAMPLES OF USING EXPERT SYSTEMS;
- WHEN TO CONSIDER THEM: POTENTIAL AND PITFALLS;
- DEVELOPMENT PROCESS FOR EXPERT SYSTEMS;

Computer-Aided Instruction

- ROLE OF AI IN CAI;
- EXAMPLE OF "INTELLIGENT" CAI;
- MAIN COMPONENTS OF INTELLIGENT CAI;

Application Prototyping

- ESSENTIAL CHARACTERISTICS OF AI TOOLS;
- SIMILARITIES WITH THE "END-USERS" APPROACH;
- DISTINCTIONS WITH THE "TRADITIONAL" DP APPROACH

Summary

- CONVERGENCE OF OFFICE AUTOMATION, 4TH GENERATION & AI SOFTWARE;
- HOW TO DISTINGUISH AI OPPORTUNITIES FROM FALLACIES;
- HOW TO "BRIDGE THE GAP"

The Speaker

This seminar will be given by Dr. Michel Pilote from Toronto. Dr. Pilote combines an in-depth knowledge of the new field of Artificial Intelligence with ten years of experience in the computer and office systems industry. He obtained his Ph.D. in AI from the University of Toronto.

Dr. Pilote has worked for many years as an AI knowledge engineer. He spent five years at IBM Canada. For the last few years, Dr. Pilote has demonstrated the applicability of AI tools and methodologies for current business problems. In particular, he conducted research on how AI could be incorporated into Integrated Office Systems. He also designed an effective program to transfer AI technology into current practical applications.

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Interested? Please phone (416) 597-0881,

or write to:

Dr. Michel Pilote
Suite 715, 45 Carlton St.
Toronto, Ontario, Canada M5B 2H9

Directory of Canadian AI Businesses

Editor's note: This directory will be published annually. Updates will be published as they are received.

Hardware

LISP CANADA INC.

5252 de Maisonneuve W. Blvd
Montreal, Que H4A 3S5
514-487-7063

Contact: Guy Chevalier

Canadian representative (sales and service) for Lisp Machine Inc., manufacturers of the Lambda series of Lisp machines.

SYMBOLICS (CANADA) LTD.

5915 Airport Road, Suite 420
Mississauga, Ont L4V 1T1
416-671-2272

Contact: Wayne Thompson

Canadian representative (sales and service) for Symbolics Inc., manufacturers of the 3600 series of Lisp machines.

XEROX CANADA INC.

703 Don Mills Road
North York, Ont M3C 1S2
416-429-6750

Contact: Bob Appleton

Canadian branch of the manufacturer of the 1100 series of AI workstations; sales and service.

Software

APPLIED AI SYSTEMS INC.

PO Box 13550
Kanata, Ont K2K 1X6
613-592-0084

Contact: Takashi Gomi

Vendor of several AI languages, including Golden Common Lisp and Micro-Prolog, and expert system toolkits, including Apes and Rulemaster. Also holds courses on AI and offers consulting services.

BABBAGE AND LOVELACE

1955 Bel-Air Drive
Ottawa, Ont K2C 0X1
613-225-2656

Contact: James Bradford

Developer of The English Machine, a natural language kit for small computers.

LOGICWARE

1000 Finch Avenue West, Suite 600
Toronto, Ont M3J 2V5
416-665-0022

Contact: Ian MacLachlan

Vendor of MPROLOG, a PROLOG implementation for a large variety of machines.

UNITEK TECHNOLOGIES CORP

13520 - 78 Avenue
Surrey, BC V3W 8J6
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Contact: Murray Lowe

Accounting and financial management software for the IBM PC, incorporating AI and expert systems techniques.

Consulting and R&D

APPLIED AI SYSTEMS INC.

See under *Software* above.

CANADIAN AI PRODUCTS CORP.

106 Colonnade Road, Suite 220
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Contact: Greg Heil

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Edmonton, Alta T6H 0W2
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Contact: Arthur Fitzpatrick

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Courses

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Publishers

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Left out? If you or your company should have been in this list but aren't, contact the editor so that you can be included in the next update.

Publishing news

New Books and Journals

Human Foundations of Advanced Computing Technology: The Guide to the Select Literature

Bernard O. Williams and John L. Burch, editors

The Report Store,
910 Massachusetts St., Lawrence, KS 66044.
April 1985.

(Paperbound, xxxvii + 259 pp.;
ISBN 0-916313-09-3; \$US75.00)

This book is a bibliography of important works on human aspects of computer design and use, including parts of other fields, such as AI, software engineering, and computer graphics, from which human factors research derives. The list comprises 737 items, extensively indexed. Unlike the same publisher's guide to the AI literature (reviewed in *Canadian A.I.*, June 1985), this volume does not include 'capsule reviews' of the items listed; rather, such reviews may be bought individually from the publisher for \$US2.50 each. Many of the listed items may also be ordered.

Readings in Knowledge Representation

Ronald J. Brachman and Hector J. Levesque, editors

Morgan Kaufman Publishers, Inc.,
95 First St., Los Altos, CA 94022.
August 1985.

(Paperbound, xix + 571 pp.;
ISBN 0-934613-01-X; \$US26.95)

The editors have collected 31 research papers in knowledge representation. Their criterion for inclusion of a paper is that it have introduced something new and important in the field. The result is an excellent volume that should be in every AI library.

(Continued next page)

An introduction to the book clearly and concisely reviews the field of knowledge representation, and explains current issues and controversies. Each paper in the collection is introduced by the editors, with an explanation of its import. In addition, a partially annotated 300-item bibliography by the editors is included to assist the reader wishing to explore further.

The book assumes a reasonable technical background in AI. It is suitable both for use in a graduate-level course in knowledge representation and as a general reference work.

Introduction to Artificial Intelligence

Eugene Charniak and Drew McDermott

Addison-Wesley Publishers, Ltd.,
PO Box 580, Don Mills, Ontario M3C 2T8
(Hardcover, xvii + 701 pp.;
ISBN 0-201-11945-5; \$^{CDN}45.95)

This is a large introductory text, suitable for an undergraduate course in AI. The only background assumed is some computer programming. All sub-fields of AI are covered: vision, language understanding, knowledge representation, inference, expert systems, planning, and learning. The book also includes an introduction to LISP.

The book is organized around knowledge representation and inference as the central focus of AI. This is in contrast to the view taken in the present 'standard' textbook, Winston's *Artificial Intelligence* (2nd edition, Addison-Wesley, 1984), in which search and constraint are seen as central. The Charniak and McDermott book assumes more willingness for hard work on the part of the student than Winston does, and is less willing to simplify as it integrates the material. Which book is preferred will be a matter of teachers' taste. As publisher of both, Addison-Wesley wins either way.

Artificial Intelligence Applications for Business Management and

Artificial Intelligence Applications for Manufacturing

Richard K. Miller

SEAI Technical Publications,
PO Box 590, Madison, GA 30650.
1985.

(Paperbound, 202 and 224 pp.;
ISBN 0-89671-063-7 and -062-9;
\$^{US}110.00 each, \$200 for both)

These two books overlap a fair bit in content. Each contains the same background on AI, expert systems, language understanding, AI on personal computers, etc. There are then a number of

chapters particular to the area covered by each. The volume on applications in manufacturing focuses mainly on expert systems: for CAD/CAM, quality control, maintenance, and so on. That on business management includes intelligent office machines, financial planning, more on language, and so on.

The material in these volumes falls into three broad categories. The first is uncritical listings of various systems for which AI-related claims are made. The second is various facts and alleged facts about AI, gleaned more from various trade publications and vendors' brochures than technical literature. The third is reprints of public domain literature. For example, the business management volume includes 80 pages of appendices that are simply reprinted from William Gevarter's overviews of AI, originally published as technical memoranda by NASA. Almost nothing of AI outside the U.S. is mentioned.

G. H.

Linguistique et informatique Linguistics and Computer Science

La *Revue québécoise de linguistique* a publié un numéro spécial comprenant six articles au sujet de la linguistique et de l'informatique:

The *Revue québécoise de linguistique* has published a special issue on Linguistics and Computer Science. The issue contains six research papers on the topic:

Théorie syntaxique et théorie du passage: quelques réflexions (*Jean-Yves Morin*)

Syntactic analysis and semantic processing (*Morris Salkoff*)

Un survol des recherches en génération automatique (*Laurence Danlos*)

Un analyseur syntaxique du français (*Henri Labesse*)

La structure des données et des algorithmes en DEREDEC (*Pierre Plante*)

Un exemple d'exploration linguistique du français à l'aide de LOGO (*Louissette Emirkantian et Lorne H. Bouchard*)

Ce numéro, vol. 14, numéro 2, coûte 14,00\$; l'abonnement est de 21,75\$ pour deux revues par an (étudiants, 15,00\$). L'adresse est la suivante:

The issue, vol. 14, number 2, is available for \$14.00; subscriptions are \$21.75 for two issues per year (students, \$15.00). The address is:

Revue québécoise de linguistique

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NOW IN PAPER

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Jeffrey Robert Sampson 1942 – 1985

Jeffrey Robert Sampson, Professor of Computing Science at the University of Alberta, died suddenly in Paris on 26 May 1985 at the age of 42.

Jeff Sampson was born in Chicago on 4 November 1942. He received his AB degree in Mathematics in 1963 from Northwestern University, and his AM and PhD degrees in Communication Sciences from the University of Michigan in 1965 and 1968, respectively. At Northwestern, his abilities were recognized by his being elected to Phi Kappa Phi and by his leadership of the university debating team. The inclusion of material from mathematics, linguistics, psychology, physiology, and computer science in his Ph thesis "A Neural Subassembly Model of Human Learning and Memory" indicates his interdisciplinary approach to education and research, a view he held throughout his career. Dr Sampson maintained a close relationship with his supervisor, Dr John Holland, with whom he founded the annual Michigan Workshop on Adaptive Systems. This Workshop now attracts scholars from around the world.

Dr Sampson joined the emerging Department of Computing Science at the University of Alberta as an Assistant Professor in 1968, was promoted to Associate Professor in 1972, and to Professor in 1979. He was active in many professional organizations and was one of the founders and first chairman of the Alberta Chapter of the Association for Computing Machinery, the second such chapter to be formed in Canada.

During this time, Dr Sampson established himself as an international expert in the area of adaptive systems. He developed courses of study and wrote a number of papers on the subject of systems which exhibit adaptive behavior. His books, *Adaptive Information Processing* and *Biological Information Processing*, are highly regarded contributions to the field.

His colleagues and friends remember him as a scholar in the truest sense of the word. Dr Sampson was widely travelled, and his interests ranged throughout his chosen field of study to music, literature, theatre, and medicine. He developed a strong interest in the Chinese people and their society, and was invited repeatedly to lecture at Chinese institutions. Through his interests and speaking ability, he brought to his lectures a wide range of expertise and good humor. His office door was always open when he was in because he believed that being available to students and colleagues was one of the primary responsibilities of being an educator. He will be greatly missed.

Dr Sampson is survived by two sons, Scott and Curt, a sister, Linda Sampson, of San Francisco, and his parents, of Chicago.

The J.R. Sampson Memorial Fund has been established for graduate students in the Department of Computing Science, University of Alberta. Donations to this Fund are welcome.

John Tartar
University of Alberta

Daniel Louis Shalom Berlin 1957 – 1985

Danny Berlin, a Canadian graduate student at Stanford University, died recently at the age of 28, after a long illness.

Danny was an undergraduate at the University of Toronto from 1975 to 1979. We came to know him as one of the few undergraduates who had the intelligence and the perseverance to become an active member of the AI group and to make a meaningful technical contribution. Despite the unsettled state of his health, he worked carefully, thoroughly, and tirelessly on the topics that interested him, focusing on the PSN system and its extensions.

After his undergraduate studies at U of T, Danny entered the graduate programme at Stanford where he worked under the supervision of Doug Lenat and later Bruce Buchanan. His research focused on general methods for

planning, using bridge as his particular example domain — he was himself a tournament bridge player. His paper reporting preliminary results from his system was presented at IJCAI last month by his wife, Lucy.

Despite his long absence from Canada, Danny maintained an active interest in Canadian AI and the fortunes of the Toronto AI group. We will remember him as a model student and a valued colleague having the intellectual capacity and the inner drive to achieve excellence.

John Mylopoulos
University of Toronto

Donald Grant Kuehner 1929 — 1984

Don Kuehner, Professor of Computer Science at the University of Western Ontario, died on 1 December at the age of 55.

Dr Kuehner was born in Sherbrooke, Quebec. He received his BSc degree from Bishop's University and his MA from Queen's. His PhD, under the supervision of Bob Kowalski at the University of Edinburgh, was entitled "Inference methods in computational logic". His work played a central role in the development of logic programming, and his publication with Kowalski is often cited.

Before joining Western in 1971, Dr Kuehner taught at the University of Maine and the University of Bridgeport. At Western, he continued his research in theorem proving and logic programming, and, more recently, also worked in machine vision.

Dr Kuehner was also an artist, and was particularly interested in Chinese painting.

E. W. Elcock
University of Western Ontario

David Julian Meredith Davies 1945 — 1985

Julian Davies, Associate Professor of Computer Science at the University of Western Ontario,

died on 12 June at the age of 39.

Dr Davies was born in London, England. He received his BA degree in theoretical physics, and later an MA and PhD, from the University of Cambridge. While at that institution, he was an Exhibitioner, Scholar, and Bye-Fellow of Downing College.

From 1969 to 1974, he held a post-doctoral research fellowship in the Theoretical Psychology Unit at the University of Edinburgh, where he worked with Professor Christopher Longuet-Higgins. He joined the faculty at Western in 1974.

Dr Davies's research interests in AI were primarily in the production of tools. He produced one of the few implementations of Hewitt's 'ACTORS' formalism, and designed TONAL, a structured language for AI. He was also interested in philosophical aspects of AI, and published a paper on the question of emotion in robots. Outside AI, he performed research in computer communications and messaging systems.

Dr Davies was an active member of the Society of Friends. He will be sorely missed by many, both within and without the university community.

E. W. Elcock
University of Western Ontario

Recent AI Technical Reports

Editor's note: Recent Canadian AI technical reports are listed in this department. Abstracts will be included as space permits, with preference being given to theses.

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University of Calgary

Requests for any of the following publications should be addressed to:

Department of Computer Science
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Knowledge representation in expert systems

Laurane L. Kramer

M.Sc. thesis

Knowledge representation is frequently said to be the central issue in expert systems research. The definition and special characteristics of an expert system demand that three criteria for knowledge representation be met: (a) expressive adequacy, the ability to represent the necessary distinctions of the domain in the representation; (b) explicitness, the accessibility of all necessary domain knowledge to an individual familiar with the domain but not with programming; and (c) naturalness, the ease with which the representation captures the structure and content of knowledge in the domain. To date, most expert systems have relied on one of two knowledge representation formalisms, rule-based production systems or frame-based conceptual graphs. A survey of the theoretical literature shows that both these formalisms are considered appropriate representations to meet the three criteria. An examination of systems utilizing these formalisms indicates that this is not the case. Important discrepancies exist between these theoretical arguments and the existing successful expert systems. In order to investigate these issues further, an expert system for the interpretation of personality inventories in clinical psychology was designed and two prototypes were implemented. On the basis of the examination of the literature and the discussion of the prototypes, the definitions of the three

criteria appearing in the literature are seen to be inadequate. More precise definitions, taking into account the field of expert systems and other areas of research into knowledge representation, are proposed and issues crucial to the evaluation of any representation are raised.

Conceptual analysis in Prolog

Roy Masrani

M.Sc. thesis (Forthcoming)

Natural language analysis systems based on conceptual dependency theory typically use production rules to build a knowledge base for the system. These systems are typically large and complex with no clear separation of knowledge and control. Words cannot be added to the lexicon without affecting the integrity of the system. Word definitions must include appropriate meaning representations as well as crucial control information.

In contrast, MARVIN — written in object-oriented Prolog — aims towards a clear separation of control and knowledge. Words in the lexicon (and more recently, scripts, plans and goals have been added) are defined as independent objects containing little or no domain specific control information. MARVIN can parse a number of simple sentences into appropriate conceptual dependency templates:

John took the aspirin / bus / apple.

From Toronto, Mary took the bus to London.

Mary told the old man to give the old car to Peter.

Mary told John that the old man gave the old car to Peter.

John was hungry. He ordered a chicken.

The black man gave twelve black cars to the old woman.

Although syntactic information is used extensively in the system to aid in semantic analysis, there is no prior syntactic processing of the input. The control mechanism embodies the notion of expectation-based parsing and a simple form of "explanation-driven understanding".

Generating advice by monitoring user behavior

Adrian Y. Zissos

M.Sc. thesis (Research Report No. 85/198/11)

User modeling for a computer coach: A case study

Adrian Zissos and Ian Witten

Research Report No. 85/199/12

A computer coach unobtrusively monitors interaction with a system and offers

individualized advice on its use. Such active on-line assistance complements conventional documentation, and its importance grows as the complexity of interactive systems increases. Instead of studying manuals, users learn highly-reactive systems through experiment, imported metaphors, and natural intelligence. However, in so doing they inevitably fail to discover features which would help them in their work.

This paper describes Anchises, a coach which aims to detect inefficient use and ignorance of important facilities of an interactive program in a domain-independent way. Its current knowledge base is the EMACS text editor, and Anchises provides highly selective access to pertinent parts of the on-line documentation with little overhead for the user. In the design of Anchises, close attention has been paid to the user modeling component, which determines the needs of an individual without entering into any explicit dialogue with him; in general this is the least well understood aspect of computer coaches. An informal experiment was conducted to determine the effectiveness of the user modeling techniques employed.

Discrete event simulation in Prolog

John Cleary, Kim-Stew Goh, and Brian Unger

Research Report No. 84/171/29

A logic programming language for simulation is presented along with several examples of its use.

A distributed graphics system implemented in Prolog

John Cleary

Research Report No. 84/173/31

A high-level language for two-dimensional graphics, GROWL, is described. The "standard" implementation of this generates directly executable Prolog code from the GROWL source. A distributed version has been completed which compiles the original source to two programs. One is intended to run on a remote processor and includes little more than the arithmetic for geometric transformations. The other runs on the host as a Prolog program and is completely free of the overhead necessary for geometric transformations but includes all the logic necessary to direct the picture construction. A novel message-passing scheme is used for communication between the two components. The result is a system which gives very compact representations of pictures on the graphics processor, a very low communications overhead and a high degree of parallelism between the host and graphics processors.

A distributed implementation of AND-parallel Concurrent Prolog

John Cleary

Research Report No. 85/190/3

A distributed binding environment for concurrent logic programs is described.

A graphical debugger for Prolog

Alan Dewar

M.Sc. thesis

DEWLAP (Debugging With Logical Applications) is a graphical debugger for Prolog, the first Prolog debugger to present program executions in an entirely graphical fashion.

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Université de Montréal

Requests for any of the following publications should be addressed to:

Département d'informatique et recherche
opérationnelle

Université de Montréal

Montréal, Québec, CANADA H3C 3J7

Generalized Unification in Prolog

Michel Boyer and Guy Lapalme

February 1985

This paper shows how Prolog can be used for the representation and construction of unordered trees with labeled arcs. The labels on the arcs are seen as names for attributes positioned at the end of the arcs. The problem of the unification of these structures is solved, giving rise to a predicate that extends Prolog's equality. Such unification results in the merging of the attributes as long as there is no conflict and reminds one of Kay's approach (it is a unification by attribute rather than by position). It is the base of a gluing method used to build large trees from smaller ones.

Generating paraphrases from Meaning-Text semantic networks

Michel Boyer and Guy Lapalme

February 1985

We describe a first attempt in paraphrase generation based upon the Meaning-Text theory of Mel'čuk and Zolkovskij which establishes transformations between meanings, represented by networks, and written texts. It generates many synonymous French phrases out of a given semantic network; it is implemented in Prolog-II, and is working on a restricted domain mainly because of its small dictionary. The

transformations are defined between intermediary representations of phrases (semantic, deep syntactic, surface syntactic, and morphological) and the final text. We have developed tools to represent those structures and to go from one to another. As the Meaning-Text theory was originally defined as a set of tree transformations, Prolog is a very appropriate tool to implement a working model of it.

**Les systemes experts
et la recherche opérationnelle**

M. Desrochers

No 386, Centre de recherche sur les transports
Novembre 1984

Les systèmes experts permettent de plus en plus d'intégrer des connaissances dans des sujets restreints et leur performance peut parfois dépasser celles d'experts humains dans ces domaines. Cet exposé tente de situer ce que sont les systèmes experts et de montrer les relations entre eux et la recherche opérationnelle: comment les systèmes experts aident-ils et pourraient-ils aider la recherche opérationnelle et quelles techniques de la recherche opérationnelle pourraient aider les systèmes experts? L'exposé se termine par un exemple d'application possible au routage.

**Guides d'utilisation:
NIL, MProlog, Prolog de York.**

S. Chapleau

No 160, Février 1985

Ce document regroupe trois manuels d'introduction à l'utilisation des logiciels suivants disponibles à l'Université de Montréal: NIL (New Implementation of Lisp) et MProlog sur le VAX-780 CCVXEN du Centre de Calcul et l'implantation du Prolog écrit en Pascal sur le VAX-750 Grafik du département. Ce ne sont pas des manuels de langages mais plutôt des premiers indices pour aider les premiers pas avec ces implantations.

Un regard informatique sur l'Oulipo

J.-E. Thebault et Guy Lapalme

No 162, Avril 1985

Ce document décrit une approche à une classification des travaux de l'ouvrage de littérature potentielle (Oulipo). Après avoir identifié les composantes de base des contraintes littéraires que se donnent les Oulipiens, nous présentons un inventaire structuré des travaux.

Un joueur informatisé de Boggle

L. Forest et Guy Lapalme

No 163, Mai 1985

Nous présentons les techniques utilisées pour la construction d'un programme joueur «optimal» de Boggle: il trouve tous les mots possibles à condition qu'ils figurent dans son dictionnaire. Dans notre cas ce sont les mots acceptables au Scrabble de huit lettres ou moins. Plusieurs exemples illustrent la flexibilité de l'approche et la puissance du programme.

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University of Toronto

Requests for either of the following publications should be addressed to:

Artificial Intelligence Group
Department of Computer Science
University of Toronto
Toronto, Ont., CANADA M5S 1A4

Understanding Adjectives

Yawar Ali

M.Sc. Thesis, TR CSRI-167
January 1985, 85 pages

This thesis deals with the task of understanding noun phrases containing sequences of prenominal adjectives.

The first problem is to determine exactly what each adjective modifies. In general, this can only be done by taking account of the semantic properties of the adjective in question, as well as those of other adjectives to its right, and of the noun itself. "Real-world" knowledge and contextual factors also play a role in this process. This is addressed by developing a classification scheme for adjectives which allows us to substantially reduce the number of candidate interpretations, in some cases to a single one. A system is presented which takes account of the disparate semantic behaviour of different classes of adjectives, word order, punctuation in the noun phrase, and a frame-based store of real-world knowledge, in order to determine the scope of adjectives within a noun phrase.

The second problem is to construct a representation of the description embodied in such a noun phrase. Here, it is desirable that the structure of the representation correspond to the structure of modification within the phrase. Particular adjectives are taken to indicate restrictions on the values that objects may take on for associated properties. These properties may be featural, dimensional, or functional in nature. Frame-like structures are used to represent the

generic concepts that are taken to be associated with noun phrases.

**Rule-Based Processing
in a Connectionist System
for Natural Language Understanding**

Bart Selman

M.Sc. Thesis, TR CSRI-168
February 1985, 57 pages

We present a connectionist model for natural language processing. In contrast with previously proposed schemes, this scheme handles traditionally sequential rule-based processing in a general manner in the network. Another difference is the use of a computational scheme similar to the one used in the Boltzmann machine. This allows us to formulate general rules for the setting of weights and thresholds.

We give a detailed description of a parsing system based on context-free grammar rules. Using simulated annealing, we show that at low temperatures the time average of the visited states at thermal equilibrium represents the correct parse of the input sentence.

The system is built from a small set of *connectionist primitives* that represent the grammar rules. These primitives are linked together using pairs of computing units that behave like discrete switches. These units are used as binders between concepts. They can be linked in such a way that individual rules can be selected from a collection of rules, and are very useful in the construction of connectionist schemes for any form of rule-based processing.



McGill University

Requests for any of the following publications should be addressed to:

Ms. Fran Lew
Computer Vision and Robotics Laboratory
Department of Electrical Engineering
McGill University
3480 University Street
Montreal, Quebec, CANADA H3A 2A7

**Reconstructing and interpreting
the 3-D shape of moving objects**

F. P. Ferrie and Martin D. Levine

TR 85-2R

This paper describes a new approach to characterizing the shape of moving 3-D objects. It is based on computing descriptions of salient physical attributes of an object at different levels of abstraction. The basis of these descriptions is a

representation for surfaces in terms of differential geometry, from which a composite model composed of geometric primitives is abstracted. The computational process consists of 3 steps: (1) Computing descriptions of object surfaces from a sequence of two-dimensional images; (2) Computing inter-frame transformations describing object motion between successive views and reconstructing surface descriptions in a world coordinate frame; (3) Computing a composite geometric model from the reconstructed surface description. This paper also presents some results from the implementation of the model in a computer vision system.

The diversity of perceptual grouping

Steven W. Zucker

TR 85-1

Perceptual grouping is commonly defined as the agglomeration of distinct, local entities into more abstract and less local ones. This single definition for all of grouping implies a homogeneity in the process that accomplishes it, a presupposition that holds from the Gestalt psychologists' original ideas to modern computational theories. In this paper we argue that such a view is valid only at a descriptive level that is so abstract as to be unproductive. We propose that, upon closer examination, grouping almost always turns out to be a myriad of different processes. The processes of grouping may be separated according to how early they take place, according to the partition of the scene domain that they induce, according to the classes of image structure on which they operate, and according to emergent psychophysical effects. These ideas are illustrated in detail with examples of dot pattern grouping and orientation selection, as well as several "higher-level" phenomena.

**Early orientation selection: Tangent fields
and the dimensionality of their support**

Steven W. Zucker

TR 85-13

Orientation selection is the inference of orientation information out of images. It is one of the foundations on which other visual structures are built, since it must precede the formation of contours out of pointillist data and surfaces out of surface markings. We take a differential geometric view in defining orientation selection, and develop algorithms for actually doing it. The goal of these algorithms is formulated in mathematical terms as the inference of a vector field of tangents (to the contours), and the algorithms are studied in both abstract and computational forms. They are formulated as matching problems, and algorithms for solving them are

reduced to biologically plausible terms. We show that two different matching problems are necessary, the first for one-dimensional contours (which we refer to as Type I processes) and the second for two-dimensional flows (or Type II processes). We conjecture that this difference is reflected in the response properties of "simple" and "complex" cells, respectively, and predict several other psychophysical phenomena.

Subjective figures and texture perception

Steven W. Zucker and Patrick Cavanagh

TR 85-2

A texture discrimination task using the Ehrenstein illusion demonstrates that subjective brightness effects can play an essential role in early vision. The subjectively bright regions of the Ehrenstein can be organized either as discs or as stripes, depending on orientation. The accuracy of discrimination between variants of the Ehrenstein and control patterns was a direct function of the presence of the illusory brightness stripes, being high when they were present and low otherwise. It is argued that neither receptive field structure nor spatial-frequency content can adequately account for these results. We suggest that the subjective brightness illusions, rather than being a high-level, cognitive aspect of vision, are in fact the result of an early visual process.

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University of Alberta

Requests for either of the following publications should be addressed to:

Tony Marsland
Department of Computer Science
University of Alberta
Edmonton, Alta., CANADA T6G 2H1

Parallel game-tree search

Tony Marsland and Fred Popowich

TR 85-1

The design issues affecting a parallel implementation of the alpha-beta search algorithm are discussed with emphasis on a tree decomposition scheme that is intended for use on well ordered trees. In particular, the Principal Variation splitting method has been implemented, and experimental results are presented which show how such refinements as progressive deepening, narrow window searching and the use of memory tables affect the performance of multiprocessor based chess-playing programs. When dealing with parallel processing systems, communication delays are perhaps the greatest source of lost

time. Therefore, an implementation of our tree decomposition based algorithm is presented, one that operates with a modest amount of message passing within a network of processors. Since our system has low search overhead, the principal basis for comparison is the communication overhead, which in turn is shown to have two components.

Experiments in distributed tree-search

J. Schaeffer, M. Olafsson, and Tony Marsland

TR 84-4

The design, implementation, and performance of two chess programs running on a multiprocessor system are presented. Methods for distributing and enhancing the alpha-beta algorithm in a parallel environment are discussed. With the Principal Variation Splitting method, a four processor chess program yields more than a three-fold speedup over the sequential version.

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Simon Fraser University

Requests for the following publication should be addressed to:

School of Computing Science
Simon Fraser University
Burnaby, B.C., CANADA V5A 1S6

Unrestricted gapping grammars:

Theory, implementations, and applications

Fred P. Popowich

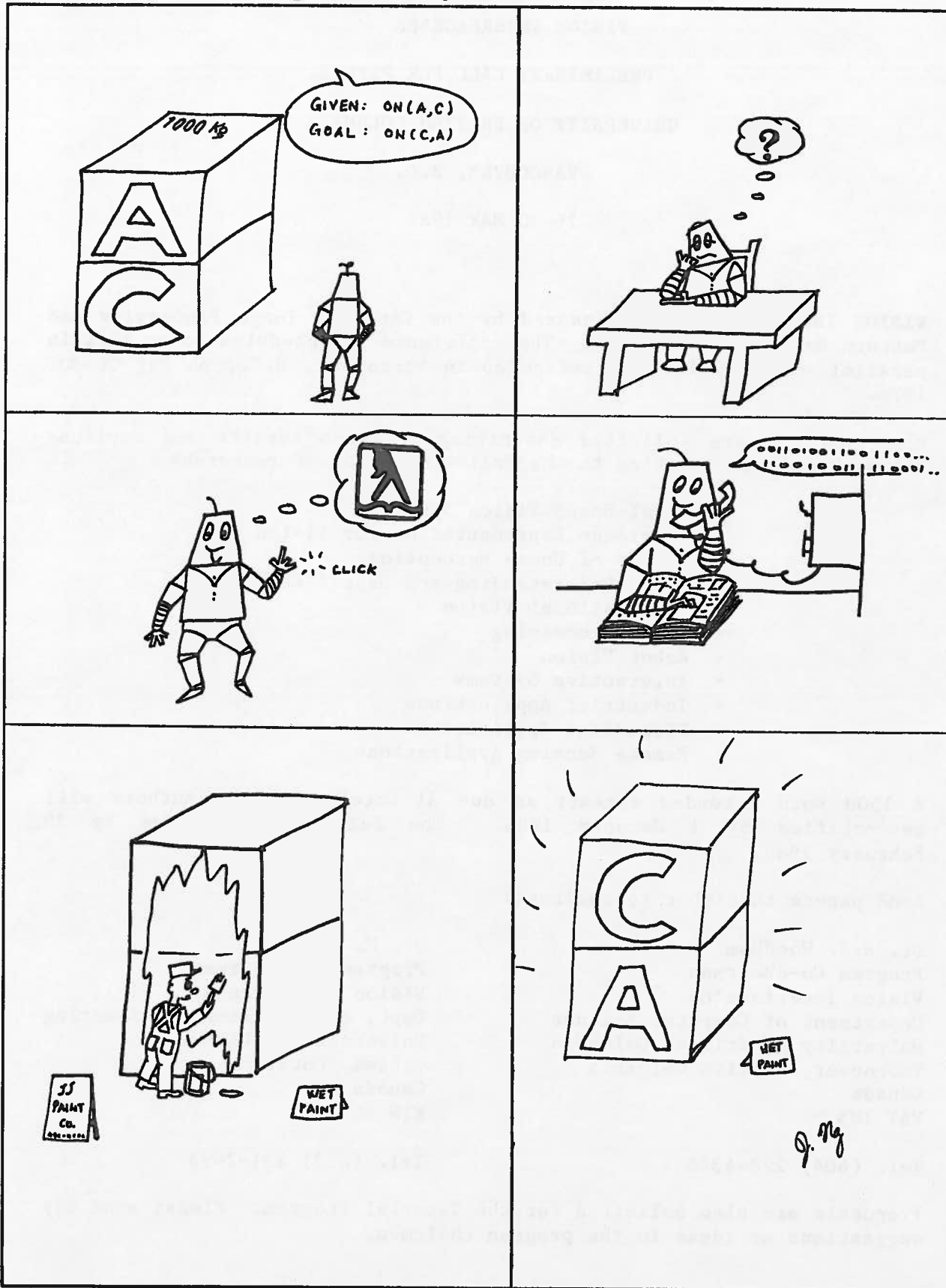
M.Sc. thesis

FIGG, a Flexible Implementation of Gapping Grammars, represents an implementation of a large subset of unrestricted gapping grammars which allows either bottom-up or top-down parsing of sentences. The system provides more built-in control facilities than previous logic grammar implementations. This makes it easier for the user to create efficiently executable grammar rules and restrict the applicability of certain rules. FIGG can be used to examine the usefulness of unrestricted gapping grammars for describing phenomena of natural languages such as free word order, and partially free word/constituent order. It can also be used as a programming language to implement natural language systems which are based on grammars (or metagrammars) that utilise the *gap* concept, such as Gazdar's *generalised phrase structure grammars*.

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Editor's note: Because of the volume received, some abstracts have had to be held over until the next issue.

Cartoon by Johnny Ng, University of Alberta



VISION INTERFACE'86

PRELIMINARY CALL FOR PAPERS

UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER, B.C.

26-30 MAY 1986

VISION INTERFACE'86 is sponsored by the Canadian Image Processing and Pattern Recognition Society. The conference is scheduled to be held in parallel with Graphics Interface'86 in Vancouver, B.C., on May 26-30, 1986.

Contributions are solicited describing research results and applications experience relating to the following areas of research:

- Model-Based Vision Systems
- Knowledge Representation for Vision
- Models of Human Perception
- Image Understanding and Object Recognition
- Computational Vision
- Image Processing
- Robot Vision
- Interactive Systems
- Industrial Applications
- Biomedical Applications
- Remote Sensing Applications

A 1500 word extended summary is due 31 October 1985. Authors will be notified by 1 January 1986. The full paper is due by 28 February 1986.

Send papers to either co-chairmen:

Dr. R.J. Woodham
Program Co-chairman
Vision Interface'86
Department of Computer Science
University of British Columbia
Vancouver, British Columbia
Canada
V6T 1W5

Dr. M. Goldberg
Program Co-chairman
Vision Interface'86
Dept. of Electrical Engineering
University of Ottawa
Ottawa, Ontario
Canada
K1N 6N5

Tel. (604) 228-4368

Tel. (613) 231-2495

Proposals are also solicited for the Tutorial Program. Please send any suggestions or ideas to the program chairmen.

Activities

Forthcoming Conferences, and Calls for Papers

**CSCSI-86:
Canadian Artificial Intelligence
Conference**

21–23 May 1986

Montréal

For details, see the announcement on pages
40 and 41.

Vision Interface '86

26–30 May 1986

University of British Columbia

For details, see the announcement opposite.

AAAI-86

**The 5th National Conference on
Artificial Intelligence**

11–15 August 1986

Philadelphia

The conference will be divided into two tracks: Science, at the beginning of the week, and Engineering, in the later part of the week. Papers in all areas of AI are solicited; maximum, 4000 words; deadline, 1 April 1986. Submit six copies of papers, and direct all enquiries, to:

AAAI-86, AAI office

445 Burgess Drive

Menlo Park, CA 94025-3496, U.S.A.

INTERNET: aaai-office@sumex-aim.arpa

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ECAI '86

**The 7th European Conference on
Artificial Intelligence**

21–25 July 1986

Brighton, U. K.

ECAI is the largest European AI conference. The program will be divided into two streams: Scientific and Industrial. Papers in all areas of AI are solicited. *Research papers* of 5000 words or less are due 1 January 1986; *position papers*, which are “informal notes of up to 2000 words with new ideas, stimulating criticism, or speculations on future directions” are due 1 March 1986. Submit papers (three copies) to the programme chairman:

Luc Steels

Vrije Universiteit Brussel

AI Lab

Pleinlaan 2

1050 Brussels, BELGIUM

Phone: +32 (0)2-641 2971

For other inquiries, contact the general chairman:

Benedict du Boulay

University of Sussex

Cognitive Studies Programme

Brighton, U. K. BN1 9QN

Phone: +44 (0)273-683 500

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**Third International Conference on
Logic Programming**

14–18 July 1986

Imperial College of Science and Technology
London, U. K.

The conference will consider all aspects of logic programming, including, but not limited to:

- Theory and foundations;
- Architectures and implementations;
- Methodology;
- Programming languages and environments;
- Applications;
- Relations to other computation models, programming languages, and programming methodologies.

Of special interest are papers related to parallel processing, papers discussing novel applications and applications that address the unique character of logic programming, and papers which constitute a contribution to computer science at large.

Papers may be submitted under two categories, short—up to 2000 words, and long—up to 6000 words. Authors should send eight copies of their manuscript, plus an extra copy of the abstract, to:

Ehud Shapiro, ICLP Program Chairman

The Weizmann Institute of Science

Rehovot 76100, ISRAEL

Deadline for submission of papers is 1 December 1985.

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COLING 86

**11th International Conference on
Computational Linguistics**

25–29 August 1986

University of Bonn, West Germany

Papers are solicited in all areas of computational linguistics and natural language understanding. Submit 5 copies (maximum, 8000 words) by 1 December 1985 to the chairman of the programme committee:

Prof Makoto Nagao

Dept Electrical Engineering

Kyoto University

Sakyo-ku, Kyoto 606, JAPAN

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Second Symposium on the Role of Language in Problem Solving

2-4 April 1986

Laurel, Maryland

Papers are solicited in relevant areas including (but not limited to) the following:

- Representation for knowledge-based systems;
- Formal notations for problem solving;
- Exploiting the power of supercomputing systems;
- "Visual" languages and "natural" notation systems;
- Issues in the construction of scientific and personal workstations;
- Heuristic methods in automating the programming process.

Authors are encouraged to discuss concepts with the programme committee. Send four copies of papers by 1 November 1985 to the symposium chairman:

Bruce W. Hamill
Applied Physics Laboratory
The Johns Hopkins University
Laurel, MD 20707
Phone: 301-953-6220

For registration enquiries, write to Barbara Northrop at the same address.

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Workshop on Motion: Representation and Analysis

7-9 May 1986

Kiawah Island Resort
Charleston, South Carolina

Analysis of image sequences is attracting increasing attention from researchers in computer vision and artificial intelligence. This workshop will bring together active researchers to discuss their approach to the representation and analysis of motion in image sequences. It is intended to restrict the number of participants and number of presentations with the aim of increasing discussions. There will be some invited papers, but most papers will be contributed by researchers. The following topics are of interest to this workshop:

- Optical flow and structure from motion;
- Event recognition and representation;
- Temporal planning and inferences;
- Control structures for dynamic scene analysis;

SCEIO - 86 Conférence canadienne d'intelligence artificielle 1986

Montréal, Canada

21-23 mai 1986

Commanditée par la
Société canadienne pour l'étude de l'intelligence
par ordinateur

La sixième conférence nationale de la CSCSI/SCEIO vous invite à soumettre des articles portant sur la recherche théorique et appliquée en intelligence artificielle, en particulier dans les domaines suivants:

- Représentation du savoir
- Vision artificielle
- Compréhension de la langue naturelle
- Systèmes d'expertise et applications
- Programmation logique et raisonnement formel
- Robotique
- Planification, apprentissage et solution automatique de problèmes
- Science cognitive
- Aspects sociaux de l'intelligence artificielle
- Architectures pour l'IA, langages et outils

Tous les articles seront jugés par le comité responsable du programme. Les auteurs sont priés de ne pas dépasser 5000 mots et de préciser le domaine auquel se rapporte leur article. De plus, il est indispensable de spécifier clairement et brièvement les contributions majeures à la



recherche en IA, et de fournir les références appropriées. Graphiques et illustrations doivent être impeccables.

Veuillez envoyer au président du comité responsable du programme trois exemplaires de chaque article avant le 31 décembre 1985. Nous ne pouvons malheureusement pas accepter les envois par courrier électronique. Tout article jugé satisfaisant paraîtra dans les Actes de la conférence.

Prière de vous adresser au président de la conférence ou au président du comité en charge du programme.

Président de la Conférence:

Renato De Mori
Centre de Recherche Informatique de Montréal
1440, rue Sainte-Catherine ouest, bureau 326
Montréal, Qué., CANADA H3G 1R8
Tél.: 514-879-5868

Secrétaire administrative:

Lynn-Marie Holland
(Même adresse que celle du président de la conférence)

Président du comité responsable du programme:

Bill Havens
Department of Computer Science
University of British Columbia
Vancouver, BC, CANADA V6T 1W5
INTERNET: havens@ubc.csnet

- Uncertainty in dynamic scene analysis;
- Applications.

Submit three copies of your complete papers by 15 December 1985. Papers should be double-spaced and should not exceed 25 pages, including figures.

John Tsotsos
 Dept Computer Science
 University of Toronto
 Toronto, Ont, CANADA M5S 1A4

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1986 Fall Joint Computer Conference
 2-6 November 1986
 Dallas, Texas

The theme of the 1986 FJCC is "Exploring the knowledge-based society", which means that AI topics are particularly appropriate. The conference solicits not only papers but also proposals for panel sessions, tutorials, workshops, and so on. Five copies are required by 15 March 1986. Send papers and panel proposals to:

Harold S. Stone
 IBM T. J. Watson Research Center
 PO Box 218
 Yorktown Heights, NY 10598, U.S.A.

Send other proposals to:
 Toni Shelter
 TRW W1/4454
 7600 Colshire Drive
 McLean, VA 22102, U.S.A

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**Intersociety Symposium on
 Artificial Intelligence Applications**
 21-23 October 1985
 George Washington University,
 Washington, D. C.

Sponsored by
 IEEE's Engineering Management Society;
 IEEE's Systems, Man and Cybernetics Society;
 GWU's Institute for Artificial Intelligence;
 TIMS' College on Artificial Intelligence;
 ORSA's Military Applications Section (MAS);
 The Washington Area Working Group on AI.

Sessions at the symposium will cover: AI in research and development; AI in design and development; AI in testing and evaluation; AI in project management; AI in production management; AI in military systems; and AI in technology insertion. Plenary

C S C S I - 8 6
Canadian
Artificial Intelligence
Conference
1986

Montreal, Canada
21-23 May 1986

Sponsored by
 Canadian Society for
 Computational Studies of Intelligence

CSCSI-86, the Sixth National Conference of CSCSI/SCEIO, invites submission of theoretical and applied research papers in all areas of Artificial Intelligence research, particularly those listed below:

- Knowledge Representation
- Expert Systems and Applications
- Natural Language Understanding
- Social Aspects of AI
- Logic Programming and Formal Reasoning
- Robotics
- Planning, Problem Solving, and Learning
- Cognitive Science
- AI Architecture, Languages, and Tools
- Computer Vision

All submissions will be fully refereed by the program committee. Authors are requested to prepare full papers of no more than 5000 words in length and specify in which area they wish their papers reviewed. All papers should contain concise clear descriptions of significant



contributions to Artificial Intelligence research with proper references to the relevant literature. Figures and illustrations should be professionally drawn.

Three copies of each submitted paper must be in the hands of the Program Chairman by 31 December 1985. Electronic submissions are, unfortunately, not acceptable. All accepted papers will be published in the conference proceedings.

Correspondence should be addressed to either the General Chair or the Program Chair, as appropriate.

General Chair:
 Renato De Mori
 Centre de Recherche Informatique de Montréal
 1440, rue Sainte-Catherine ouest, bureau 326
 Montréal, Qué., CANADA H3G 1R8
 Phone: 514-879-5868

Conference Secretary:
 Lynn-Marie Holland
 (Address as above)

Program Chair:
 Bill Havens
 Department of Computer Science
 University of British Columbia
 Vancouver, BC, CANADA V6T 1W5
 INTERNET: havens@ubc.csnet

addresses will present views of the status and significance of AI research from industrial and government perspectives.

Special issues of *IEEE Transactions on Engineering Management* and *IEEE Transactions on Systems, Man, and Cybernetics* are planned as products of the symposium.

For more information, contact:
Dr. Barry G. Silverman
Institute for Artificial Intelligence
Gelman Library, Room 636A
George Washington University
Washington, DC 20052, U. S. A.
Phone: 202-676-6443

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**1985 North American Fuzzy
Information Processing Society
Workshop on Approximate Reasoning Theory
and Applications**

24-25 October 1985

Atlanta, Georgia

For more information:
Thomas Whalen / Brian Schott, NAFIPS '85
Decision Sciences Department
Georgia State University
Atlanta, Georgia 30303 - 3083
Phone: 404-658-4000

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**North American Fuzzy
Information Processing Society
International Meeting**

1-4 June 1986

Monteleone Hotel, New Orleans

For more information:
NAFIPS86
Department of Computer Science
Florida State University
Tallahassee, FL 32306, U.S.A.

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**Society for Computer Simulation
1986 Multiconference**

23-25 January 1986

San Diego

The Society for Computer Simulation is sponsoring a "multiconference", which will include papers in intelligent simulation environments and applications of AI in simulation. For more details:

Heimo H. Adelsberger
Computer Science Department
Texas A&M University
College Station, TX 77843, U.S.A.
Phone: 409-845-0298

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Proceedings of the IEEE

Special Issue on Knowledge Representation

The special issue is scheduled for publication during the second half of 1986. You are invited to submit a 6-10 page extended abstract on any topic relevant to the current state of the art in knowledge representation. Deadline for submission of abstracts: 30th September 1985.

M Rosner
ISSCO
54 route des Acacias
1227 Geneva, SWITZERLAND
INTERNET: rosner%cgceuge51@wiscvm.arpa
UUCP: . . !mcvax!cernvax!cui!rosner

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Applications of Artificial Intelligence

31 March-4 April 1986

Part of SPIE's 1986 Technical Symposium
Southeast on Optics and Optoelectronics
Sheraton-Twin Towers, Orlando, Florida

Includes a tutorial programme on AI, expert systems, and intelligent robotics. Abstracts of papers (four copies) are due 30 September 1985. For more information, and to submit abstracts:

SPIE
PO Box 10
Bellingham, WA 98277-0010, U.S.A.
Phone: 206-676-3290

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International Electronic Image Week

21-25 April 1986

Nice, France

The event will include a symposium on the theme "Image processing, synthesis, and applications", an industrial forum, and an exhibition. Abstracts of 1,000 to 2,000 words should be submitted by 1 October 1985. Presentations may be in French or English, but abstracts should be in English.

Semaine Internationale de l'Image Electronique
CESTA, 1 rue Descartes
75005 Paris, FRANCE
Phone: +33 (1) 46 34 32 98

**Guidelines for
electronic submissions**

Canadian A. I. prefers submissions to be made by network mail when possible, to eliminate the need for retyping. However, please do not send text that has been through a document formatter; extra embedded spaces and hyphenated line breaks just have to be edited out again before typesetting. The best thing to send is plain typing or *troff* source (preferably with *-me* macros).

Use this form to join CSCSI/SCEIO, and to order
Computational Intelligence and CSCSI/SCEIO conference proceedings

Canadian Society for
Computational Studies
of Intelligence

Société canadienne pour
l'étude de l'intelligence
par ordinateur

Application for Membership and / or Journal and Conference Proceedings Order

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