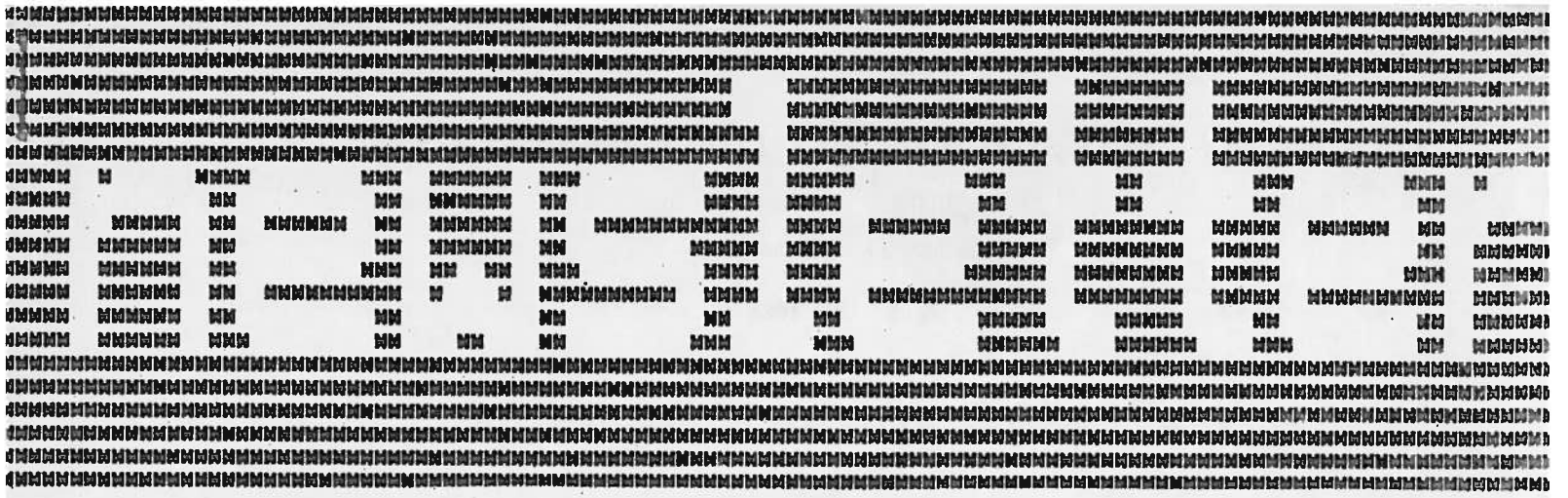

CSCSI/SCEIO **CMCCS/ACCHO** **CIPPRS**

Vol. 3, Number 1 March 1984

THE CUP OVERFLOWETH

This issue is so large that I hesitate to add to your reading; however, judging from the response that I get from the comments that sometimes grace this space, I'm not sure how many read it anyway. It is probably worthwhile to contribute something, even though its merit may be dubious.

Recent developments on the research scene in Canada are somewhat exciting and even maybe a little bit scary. The exciting part is that people have recently found money (real dollars, I'm told) to support university research. That is great, in fact maybe even fabulous. On reflection, however, there is the ever present concern about the abilities of those involved, particularly in some cases where the knowledge of the field is non-existent.

There are two meetings in March which may be of some significance. There is a Science Council sponsored conference on "Machines that Think, Sense and Act and Their Applications" in Ottawa on 25, 26 and 27 March 1984. For more information, call Cathy Lawless of the Canadian Institute for Advanced Research at 416-963-1458. The second meeting is an NSERC sponsored workshop on Research Directions in 5th Generation, to be held in Ottawa on 28 March 1984. For more information on this workshop, contact Carl Hamacher at 416-978-3145.

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This newsletter is published by CSCSI/SCEIO, CMCCS/ACCHO, and CIPPRS at the University of Alberta, Department of Computing Science, Edmonton, Alberta, T6G 2H1.

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2.

NATO ADVANCED STUDIES INSTITUTE

Bonas, Gers, France

July 2 - 14, 1984

New Systems and Architectures for

Automatic Speech Recognition and Synthesis

The objective of this Advanced Studies Institute is to discuss and study new concepts and technologies in systems and architectures for automatic speech recognition and synthesis through tutorial lectures by leading experts, paper presentations and panel discussions by participants of the ASI. Some support will be available to qualified attendees of this ASI. Application and registration package will be mailed to you upon request. Should you wish to present a paper at this ASI, please send us a 2-page summary for consideration by our committee.

Schedule

Deadline for application: April 15, 1984

Notification of acceptance & amount of support: May 1, 1984

Contact for information, application and registration forms:

Prof. R. De Mori
Co-Director, NATO ASI
Tel. 514-879-8070

or

Prof. C. Y. Suen
Co-Director, NATO ASI
Tel. 514-879-8067

at Department of Computer Science, Concordia University, 1455 de Maisonneuve Blvd. West, Montreal, Quebec H3G 1M8, Canada.

GRAPHICS INTERFACE '84 - PRELIMINARY PROGRAM
27 May - 1 June 1984 - Ottawa, Ontario

GRAPHICS INTERFACE '84 is *the* 10th Canadian Computer Graphics Conference. While it is directed primarily at those already working in computer graphics, it is also aimed at potential users of graphics hardware/software technology including decision-makers in government, industry, and business. Sponsors for this year's conference include the Canadian Man-Computer Communications Society, Faculty of Engineering, Carleton University, the University of Ottawa, and the National Computer Graphics Association of Canada,

TUTORIALS REGISTRATION:

Sunday, May 27, 7:00 p.m. - 10 p.m.
Monday, May 28, 7:30 a.m. - 9:00 a.m.
Tuesday, May 29, 7:30 a.m. - 9:00 a.m.
University Centre, University of Ottawa

CONFERENCE REGISTRATION:

Tuesday, May 29, 9:00 a.m. to 10:00 p.m.
Wednesday, May 30, 7:30 a.m. - 5:00 p.m.
Thursday, May 31, 7:30 a.m. - 5:00 p.m.
Friday, June 1, 7:30 a.m. - noon.
University Centre, University of Ottawa

EARLY REGISTRATION BONUS FOR REGISTRATIONS POSTMARKED BEFORE APRIL 17, 1984. Please make payment (Canadian funds - cheque or money order) with registration. No purchase orders will be accepted.

A limited number of rooms have been set aside for Graphics Interface '84 at the FOUR SEASONS HOTEL, 150 Albert Street (phone 613-228-1500 toll free). You are advised to book your room well in advance.

As well, rooms will be available in student residences at the University of Ottawa for conference participants.

****

For further information and registration forms, contact:

Ms. Danielle Baum
7th floor, Coates Bldg., Section P
Statistics Canada
Tunney's Pasture
Ottawa, ON
K1A 0T6
Telephone: (613) 996-7017

or

Dr. Neal M. Holtz
Department of Civil Engineering
Carleton University
Ottawa, ON
K1S 5B6
Telephone: (613) 231-2677

TUTORIALS

Registration for a tutorial session entitles the attendee to a full day tutorial, a binder of tutorial notes and a tutorial kit. Registration will be on a first come, first served basis. PLEASE PRE-REGISTER, indiating your first preference for each tutorial, as well as your second, third, and fourth chices. Preference will be given to individuals attending both tutorial sessions.

1. INTRODUCTION TO COMPUTER GRAPHICS/COMPUTER AIDED DESIGN

This is a stream directed at an audience interested in learning about the basics of Computer Graphics and CAD. The stream will not deal with specific applications, but will provide information on computer terminology, input/output devices, equipment availability, hardware configurations and future trends.

T1.1 Introduction to Computer Graphics (Monday)
Marceli Wein, Computer Graphics Section, National Research Council

A tutorial directed at the novice seeking information in Computer Graphics or the user wishing a more in-depth understanding of the operations of Computer Graphics systems. Topics to be discussed are hardware configurations, input/output devices, graphics screens, and available peripherals.

S1.1 Introduction to CAD (Tuesday)
Faith Akben, CAD Developments, Systemhouse

A seminar directed at professionals using CAD systems who are seeking more information regarding the operations of graphic-based equipment and software, the various systems available, and the costs involved for purchase and operation of in-house systems.

2. ADVANCED COMPUTER GRAPHICS

A stream directed at an audience with a working knowledge of methods of Computer Graphics with hands-on software application programs experience. If you are unfamiliar with the basics of Computer Graphics techniques, you are advised to attend "Introduction to Computer Graphics".

T2.2 Intro to Free Form Curves and Surfaces I (Monday)
John Beatty, Computer Science Department, University of Waterloo
Brian Barsky, Computer Graphics Laboratory, Univ. of California, Berkeley

A tutorial dealing with the basics of curves and shape generation on raster graphics systems. The tutorial is geared to individuals with knowledge of Computer Graphics.

T2.2 Colour Perception (Monday)
William Cowan, National Research Council
(no description)

S2.1 Intro to Free Form Curves and Surfaces II (Tuesday)
(Advanced Surface Modeling)
John Beatty and Brian Barsky

A seminar directed at individuals with a good working knowledge of Computer Graphics. A prerequisite for this course is the 'Introduction to Curves' tutorial. The seminar will deal with curved surface generation, surface modelling, freeform surfaces, and related algorithms.

S2.2 Geometric Modeling (Tuesday)
Robert Woodbury, Carnegie Mellon University

For those interested in obtaining knowledge of Geometric Modelling terminology, equipment and techniques. A prerequisite for this course is 'Introduction to Computer

Graphics', 'Introduction to Curves', or a good working knowledge of three dimensional Computer Graphics.

3. LOW COST GRAPHICS

This stream will be directed at an audience interested in obtaining more information on micro-computer Computer Graphics systems. The course will be self contained and will extend from the basics of generating lines on television display to sophisticate work on three-dimensional representation for micros.

T3.1 Introduction to Micro Computer Graphics/Graphics Application (Monday)
Donald White, Public Works Canada.
Richard Hulbert, R. E. Hulbert and Partners

An intrductory tutorial on micros, no computer graphics experience is necessary. The basics of computer graphics will be demonstrated including actual equipment on view for visualization of techniques. This course will include a summary of available equipment, software, input devices, hardcopy machines and programming techniques.

The graphics seminar will provide information on sophisticated applications for Computer Graphics for micro-computers. Topics to be covered include: two-dimensional drawing, three-dimensional wire frame modelling, and colour infill methods.

S3.1 Advanced Graphics for Micros (Tuesday)
Dr. Donald Collins, ACADZ Ltd.

This seminar will be directed at advanced computer graphics for micros. Topics to be discussed include: line generation, representation, shape synthesis, and parametric design of shapes.

4. Interaction Techniques

This stream is directed at an audience wishing more information on man-machine interface and Computer Graphics.

T4.1 User Interface Design I (Monday)
William Buxton, Ronald Baecker, John Arnott, University of Toronto

Introduction to the issues and techniques of User Interface Design, including: environmental considerations, ergonomics and interface design, interactive devices and techniques, user interface management systems, and user interface design methodology. These two tutorials are directed to attendees with or without technical background and interdisciplinary approach will be adopted.

T4.2 User Interface Design II (Tuesday)
William Buxton, Ronald Baecker, John Arnott

A continuation of T4.1. It is mandatory to have attended T4.1.

5. Computer Graphics Applications

A stream for practitioners seeking more detailed information on a specific application area. Attendance at 'Introduction to Computer Graphics' is recommended if you have no working knowledge of Computer Graphic Systems.

S5.1 Geocartographics (Tuesday)
Joel Yan, Statistics Canada

An introduction and overview of geographic information processing systems including: types of data, data structures, application packages, and future trends. The seminar will also give examples of work carried ot in Canada, in particular at Statistics Canada, but in general, at major government establishments.

5.2 Business Graphics (Tuesday)
Craig Curran, Frank Hibbeln, Accugraph Corp.

A seminar directed at individuals involved in the production or the evaluation of business graphics computer tools. The lectures will concentrate on available packages, package sophistication, hardware configurations, program adaptability, aesthetic values of output, database structures, three-dimensional representation of data, and future trends.

5.3 Videotext (Tuesday)
Herbert Bown, Douglas O'Brien, IDON Corporation

A seminar dealing with the videotext and teletext technology. Topics to be discussed include: NAPLPS and NABTS coding standards. application of videotext technology, and public and private (closed) user group application of videotext. Systems to be discussed include: TELEGUIDE, GRASSROOTS, CANTEL and stand-alone electronic displays for conference, hotel and public information networks.

S5.4 Mechanical Parts Design and Computer Graphics (Tuesday)
David Bonham, University of New Brunswick

A seminar dealing with the relationship between computer graphics and geometric modelling, computer-aided design-computer-aid design-computer-aided manufacturing, numerical control, flexible manufacturing workcells, and robotics.

S5.5 Architecture/Engineering/Construction (Tuesday)
Clive Liu, Formative Technologies

A seminar directed at the architecture, engineering and construction industries. Topics to include introduction to computer graphics to A/E/C, available systems for CADD, available A/E software, three-dimensional modelling capabilities, and the integration of multidisciplinary data.

S5.6 Television Video (Tuesday)
Charles Poynton, Poynton Vectors Corp.

A seminar directed at video and television individuals interested in obtaining knowledge of the integration of Computer Graphics techniques and video presentation. Topics to be covered include: equipment terminology, keyframe animation, paint systems, frame interpolation, video synchronization, colour limitations, matting techniques, and artist/machine interface.

TECHNICAL SESSIONS

ANIMATION I
9:00 - Wednesday 30 May 1984

DIRECTOR ORIENTED 3-D SHADED COMPUTER ANIMATION
Nadia Thalman, Ecole des Hautes Etudes Commerciales

ALGORITHMS FOR BRUSH MOVEMENT IN PAINT SYSTEMS
Kenneth T. Fishkin and Brian A. Barsky, University of California, Berkeley

TOWARDS EXPRESSIVE ANIMATION FOR INTERACTIVE CHARACTERS
Kurt Fleischer, Mark Vickers, Ann Marion and James Davis, Atari Inc.

BUSINESS GRAPHICS
09:00 - Wednesday 30 May 1984

THE OFFICE OF THE FUTURE
Jim Mackie, Mitel Corp.

DESIGN FOR A TELIDON-BASED BUSINESS GRAPHICS PROCESSOR

Thomas Whalen, Department of Communications

BUSINESS GRAPHICS INTERFACE TO DATABASES
Kuan-Tsae Huang and Moshe M. Zloof, IBM Corporation

ANIMATION II
10:45 - Wednesday 30 May 1984

INTERACTIVE KEY FRAME ANIMATION OF 3-D ARTICULATED MODELS
David Sturman, New York Institute of Technology

INTERPOLATING SPLSINES FOR KEYFRAMES ANIMATION
Doris H. U. Kuchanek and Richard H. Bartels, Office national du film du Canada

A COLOUR GRAPHIC REAL-TIME ANIMATION SYSTEM
A. S. Malowany and B. Kashef, McGill University

10:45 Wednesday 30 May 1984
PANEL - Statistical Graphics

MODELLING
13:45 - Wednesday 30 May 1984

PRIMITIVES IN COMPUTER GRAPHICS
Alain Fournier, University of Toronto

TOPOLOGY AS A FRAMEWORK FOR SOLID MODELLING
Kevin Weiler, General Electric

GEOMETRIC CONTINUITY AND SHAPE PARAMETERS FOR CATMULL-ROM SPLINES
Tony D. DeRose and Brian A. Barsky, University of California, Berkeley

GRAPHICS ENVIRONMENTS
13:45 - Wednesday 30 May 1984

EXPERIENCE WITH THE CEDAR PROGRAMMING ENVIRONMENT FOR
COMPUTER GRAPHICS RESEARCH
Richard Beach, Xerox Corp.

PED: A "DISTRIBUTED" GRAPHICS EDITOR
Theo Pavlidis, Bell Laboratories

DYNAMIC ATTRIBUTES HANDLING ON A GKS WORKSTATION
Martin Rudalics

ANTI-ALIASING AND RAY TRACING
15:30 - Wednesday 30 May 1984

TWO ALGORITHMS FOR DRAWING ANTI-ALIASED LINES
Dan Field, University of Waterloo

RAY TRACING WITH CONES
John Amanatides, University of Toronto

SOME NEW INGREDIENTS FOR THE COOKBOOK APPROACH TO ANTI-ALIASED TEXT
Avi Naiman, University of Toronto

AN APPROXIMATE METHOD FOR ANTI-ALIASING, USING A RANDOM ACCESS Z-BUFFER
K. B. Evans, National Research Council

15:30 - Wednesday 30 May 1984
PANEL

BUILDING DESIGN
09:00 - Thursday 31 May 1984

COMPUTERS IN ARCHITECTURAL DESIGN
Douglas Cardinal, D. Cardinal Architect Ltd.

GEOMETRIC RELATIONS IN SOLID MODELS
Robert Woodbury, Arvind Deogirikar and Domenic Carrega, Carnegie Mellon University

ARCHITECTURAL MODELLING: TRANSFORMATIONS IN PERSPECTIVE SPACE
G. Andonian, Carleton University

MOVEMENT AND AUTOMATION
09:00 - Thursday 31 May 1984

MODELLING AND ANIMATING THE HUMAN FORM
Norman Badler, University of Pennsylvania

SPATIAL PLANNING, GEOMETRIC MODELLING AND FUZZY PRODUCTION RULES IN ROBOTIC SYSTEMS
David R. Dodds, Bell-Northern Research

INTERACTIVE GRAPHICS SIMULATION SYSTEM (IGSS) FOR THE ASSEMBLY OF MECHANICAL PARTS
Hema A. Murthy and R.G.S. Asthana, McMaster University

DESIGN
10:45 - Thursday 31 May 1984

THE USES OF SOLIDA MODELLING IN CAD
Charles Eastman, Formative Technologies Inc.

INTERACTIVE GRAPHICS AND THE REPRESENTATION OF NON-LINEAR WOVEN TEXTILE STRUCTURES
J. A. Hoskins & M. W. King, University of Manitoba

INTERACTIVE FORM SCULPTING: A DRAWING BOARD
Roy Mckelvey and Robert Woodbury, Carnegie-Mellon University

PANEL 10:45 Thursday 31 May 1984

GRAPHICS TECHNIQUES I

13:45 - Thursday 31 May 1984

2-D AND 3-D INTERACTIVE COMPUTER MODELLING SYSTEMS
Kellogg Booth, University of Waterloo

USING RECURSION TO DESCRIBE POLYGONAL SURFACES
Brian Wyvill, Breen Liblong and Norman Hutchinson, University of Calgary

REAL TIME LIGHTING MANIPULATION VIA LOOK-UP TABLES
K. B. Evans and C. M. Penner, National Rersearch Council

GRAPHICS TECHNIQUES II

15:30 - Thursday 31 May 1984

THE PROJECTION OF IMAGES ONTO ALPHAGEOMETRIC (TELIDON) BASES
David C. Coll and Shekhar Singh, Carleton University

EXPLOITING PARALLELISM IN IMAGE SYNTHESIS APPLICATIONS
Gerald Leitner, Columbia University

A FAMILY OF NEW ALGORITHMS FOR SOFT FILLING
Kenneth P. Fishkin and Brian A. Barksy, University of California at Berkeley

TOWARDS AN EFFECTIVE USER INTERFACE FOR INTERACTIVE COLOUR MANIPULATION
Michael W. Schwartz, John C. Beatty, William B. Cowan and Jane Gentleman, University of Waterloo

APPLICATIONS
15:30 - Thursday 31 May 1984

OFFICE AUTOMATION SYSTEM INTEGRATION THROUGH A HIGH LEVEL USER INTERFACE PROTOTYPE
C.Y.K. Kwan and P. G. Sorenson, University of Saskatchewan

A REVIEW OF FACILITIES REQUIRED FOR COMPUTER GRAPHICS IN AN INFORMATION ORIENTED ENVIRONMENT
Misa Gratton, Statistics Canada

TOWARDS AUTOMATING THE PRODUCTION OF SOIL SURVEY MAPS
David B. Arnold, University of East Anglia

INTERACTION I
09:00 - Friday 1 June 1984

THE BLIT AND THE USER'S PERCEPTIONS OF THE COMPUTER
Robert Pike, AT&T, Bell Labs

SOFT MACHINE: A PERSONABLE INTERFACE
John Lewis, MIT

A SIMPLE USER INTERFACE FOR A COMPLEX WINDOW MANAGER WITH ICONS
Brad A. Myers, University of Toronto

GEOGRAPHY AND MAPPING
09:00 - Friday 1 June 1984

EXPERIMENTS WITH A RIDGE AND CHANNEL DIGITAL ELEVATION MODEL
Dave Douglas, University of Ottawa

MICROPROCESSOR SUPPORT FOR URBAN STREET NAVIGATION
Howard J. Ferch, University of Manitoba

ENLARGING RULES AND GENERALIZATION METHODS IN AN ELECTRONIC ATLAS
Eva Siekierska, EMR Canada

INTERACTION II
10:45 - Friday 1 June 1984

MOTION PICTURE DEBUGGING IN A DATAFLOW LANGUAGE
Stanislaw Matwin and Tomasz Pietrzykowski, University of Ottawa

A PROGRAMME FOR THE DEVELOMENT OF A MATHEMATICAL THEORY OF INTERACTIVE COMPUTER GRAPHICS
Eugene Fiume and Alain Fournier, University of Toronto

THE DESIGN OF A TRACKBALL CONTROLLER
David Martindale, University of Waterloo

MFE: A SYNTAX DIRECTED EDITOR FOR INTERACTION SPECIFICATION
Rubert V. Rubin and Joseph N. Pato, Brown University

PANEL - 10:45 Friday 1 June 1984

ICPR TUTORIALS

28 and 29 July 1984

MONTREAL, Quebec

Draft - 29 February 1984

SCHEDULE

SATURDAY, 28 JULY 1984

8:30 - 12:00

Speech	Renato DeMori, Concordia
Robotic Manipulators	Mathew Mason, Carnegie-Mellon
Introduction to Image Processing	Robert Haralick, VPI and State
Expert Systems	Edward Shortliffe & Bruce Buchanan, Stanford

1:30 - 5:00 p.m.

Speech, continued	
Robotic Vision	Takeo Kanade & Jim Crowley, Carnegie-Mellon
Introduction to Image Processing, continued	
Expert Systems, continued	

SUNDAY, 29 JULY 1984

8:30 - 12:00

CAD/CAM	Dave Bonham, University of New Brunswick
Special Purpose Architectures	Mike Duff, University College, London
Visual Inspection	L. F. Pau, Battelle Geneva
Image Communications	Birendra Prasada, Bell-Northern Research

1:30 - 5:00 p.m.

CAD/CAM, continued	
Image Communications, continued	
Dynamic Image Analysis	H.H. Nagel, Fraunhofer Institut
Image Data Bases	George Nagy, University of Nebraska
	and Steve Tanimoto, University of Washington

Dynamic Image Analysis
13:30 - 17:00 Sunday 28 July 1984

Speaker: H.-H. Nagel, Fraunhofer Institut fur Informations und Datenverarbeitung

Content: Image sequences capture information about the temporal as well as spatial variations of recorded scenes. Technological developments which facilitate image sequence analysis will be outlined, followed by a survey of various application areas. The main part will treat recent approaches to cope with the following problems: review of approaches to the estimation of displacement vector fields as a mapping between consective image frames; dissimilarity grading between different images frames (change detection); formal relations between approaches for displacement vector estimation and dissimilarity grading; hierarchy of abstractions for the description and interpretation of interframe dissimilarities and displacement vector fields (moving rigid 3-D point configurations, surfaces and 3-D objects; non-rigid objects, 3-D object configurations and object trajectories in 3-D space); higher level abstractions related to the description of temporal variations in scenes (motion verbs, episodes); other hypotheses to be considered are changes in the location, direction, color and other attributes of illumination sources and their effects on the recorded scene. Common tasks such as object or target tracking as well as scene surveillance will be treated in this context.

Biography: Hans-Hellmut Nagel obtained his Diplom in Physics from the University of Heidelberg in 1960 and his doctorate in Physics from the University of Bonn in 1964. He spent time at MIT, and subsequently at Bonn and Hamburg on the automatic evaluation of bubble chamber film. He obtained his venia legendi (Habilitation) at the University of Bonn in 1970. In 1971 he became full professor of Informatik (Computer Science) at the University of Hamburg and in January of 1983 at the University of Karlsruhe in a joint appointment as director of the Franhofer-Institut fur Informations und Datenverarbeitung at Karlsruhe. Since 1971, his activities center on the evaluation of image sequences, especially TV-frame sequences. In addition, his interests include the implementation and use of higher level programming languages for the realisation of image analysis systems on networks. He is an associate editor of Computer Vision, Graphics and Image Processing, a member of the editorial board of AI Journal as well as Pattern Recognition Letters, and is on the advisory board of IEEE Trans. Pattern Analysis and Machine Intelligence. He is a member of Gesellschaft fur Informatik, AISB, ACM, IEEE Computer Society and the Pattern Recognition Society.

Computer Speech
8:30 - 17:00 Saturday 28 July 1984

Speaker: Renato DeMori, Concordia University

Content: Dr. DeMori will speak on the following topics: the speech communication chain; problems and difficulties in Automatic Speech Recognition (ASR); a brief history of achievements; passive and active model for ASR; an overview of signal analysis methods for ASR; dynamic programming (DP) algorithms as a tool for time warping and matching between an input pattern and a prototype pattern; methods for automatically learning prototypes; two-level DP-matching for connected and recognition; VLSI for DP-matching; continuous speech recognition using stochastic language models; automatic learning of stochastic models; rule-based generation of hypotheses about phonetic features; the use of phonetic and phonological knowledge in accessing a large lexicon; the use of syntax and semantics; and search strategies and system architectures.

Biography: Renato DeMori has a Doctoral degree in Electronic Engineering from the Polytechnics of Turin where he was a Professor of Electrical Enginering. He also has been a Professor and Chairman of the Department of Computer Science, University of Turin. Recently he joined the Department of Computer Science at Concordia Uniersity. Dr. DeMori is a member of the ACM and IEEE, and he is also on the Advertising Committee of EURASIP. He is an Associate Editor of three international journals, and the author of more than 70 papers, the author of a book on computer speech, and the co-editor of another. Dr. DeMori is the chairman of the Speech Recognition Committee of IAPR.

Manipulators for Robots
08:30 - 12:00 Saturday 28 July 1984

Speaker: Mathew Mason, Carnegie-Mellon University

Content: This tutorial will review basic concepts and princpals of robotics as well as major trends in advanced robotics research. It will discuss the structure and capabilities of typical robot systems, using examples drawn both from commercial installations and from research laboratories. Also examined will be fundamental methods of manipulation, including programmed motion, compliant motion, grasping, and the use of sensory feedback. The tutorial will conclude with an introduction to work on model-based programming and automatic planning of robot programs.

Biography: Matt Mason is an Assistant Professor at Carnegie-Mellon University, holding a joint appointment with the Computer Science Department and the Robotics Institute. He received his Ph.D. in 1982 from the MIT Artificial Intelligence Laboratory. In 1983, at the International Symposium of Robotics Research, Dr. Mason received the System Develoment Foundation Prize for the best recent doctoral thesis in robotics.

CAD/CAM
8:30 - 17:00 Sunday 28 July 1984

Speaker: Dave Bonham, University of New Brunswick

Content: t.b.d.

Biography: t.b.d.

Image Data Bases
13:30 - 17:00 Sunday 29 July 1984

Speaker: George Nagy, University of Nebraska, Lincoln and Steve Tanimoto, University of Washington

Content: Databases of images and of other forms of pictorial information are increasingly important in medicine, remote sensing, computer-aided design, computer graphics, digital cartography, geography, document processing, and industrial pattern recognition. This tutorial surveys techniques of database management and picture processing that are relevant to the design of pictorial database systems. Emphasis is placed on the adaptation, integration and application of the techniques to provide more effective systems. Specifically covered are: logical and physical database organization including views, hierarchical, network, relational

and hybrid approaches; image data structures including multiresolution and contour-based methods; image data compression; algorithms for pictorial and spatial information retrieval including methods from computational geometry; query methods; pictorial indexing; progressive transmission; and interactive techniques. Current and future pictorial database systems will be discussed, including design implications of laser disk technology.

Biographies: George Nagy has a Ph.D. in Electrical Engineering from Cornell. He spent ten years at the IBM T.J. Watson Research Center, developing pattern classification techniques for optical character recognition, speech processing, data compression, and remote sensing. He has been chairman of the Computer Science Department at the University of Nebraska. He has spent time at Cornell University, Universite de Montreal, IBM, Bell Laboratories, the Italian Research Council's laboratories at Genoa and Naples, and INRS/Bell-Northern Research in Montreal. He has served as a research consultant also for Tektronix, Compression Laboratories, Caere Corporationon, and NASA. He has given lectures at many universities and technical conferences, and is the author of numerous research and survey articles. Currently a Professor at the University of Nebraska-Lincoln, he research interests are in geographic data processing, digital image registration, and quantitative evaluation of the computer interface.

Steven Tanimoto is currently an Associated Progressor in the Department of Computer Science at the University of Washington in Seattle, where he conducts reserch and teaches image processing, computer graphics and artificial intelligence. His research in image processing has concentrated on pyramidal data structures and the languages and parallel algorithms that work with them. Another research project is concerned with the use of pictures and diagrams to program and use computers. During the 1982-83 academic year he was a visiting professor at the Institut de Programmation, University of Paris, and a visiting scientist at the Department of Electrical Engineering, Linkoping University, Sweden. Tanimoto received the bachelor's degree from Harvard University iin 1971 and the Ph.D. in Electrical Engineering from Princeton University in 1975.

Expert Systems - Theory and Practice
08:30 - 17:00 Saturday 28 July 1984

Speakers: Edward H. Shortliffe and Bruce G. Buchanan, Stanford University

Content: This one-day tutorial will provide a broad introduction to the subject of expert systems. The emphasis will not only be on practical issues involved in structuring the knowledge of a domain and building an acceptable consultation tool, but will also include theoretical issues to help identify the key areas for ongoing research and the limitation of accomplishments to date. Topics covered will include: the conceptual roots of the field; techniques for the representation of expert knowledge; methods for controlling the inference mechanisms; the process of building an expert system; interviewing experts; selection of an optimal representation strategy; high level tools for building expert systems; inexact inference and system validation. Examples will be drawn from many representative systems, including DENDRAL, MYCIN, PROSPECTOR, INTERNIST/CADUCEUS, XON, MOLGEN, CASNET, ONCOCIN, EMYCIN, AGE, EXPERT, and MRS. At the conclusion of the tutorial, attendees will have a broad familiarity with expert systems, the key research issues and programs, and will have the foundation necessary for further independent reading and study.

Biographies: Edward Shortliffe is an Assistant Professor of Medicine and Computer Science at Stanford University. He was principal developer of the expert system known as MYCIN. His interests include the broad range of issues related to expert systems and their effective

implementation. Of particular concern are models for evidential reasoning and representation techniques to support advanced explanation capabilities. Currently he divides his time between clinical medicine and computer science research. Dr. Shortliffe serves on several editorial boards and review committees. In addition, he received the Grace Murray Hopper Award of the Association for Computing Machinery in 1976 and is a Henry J. Kaiser Family Foundation Faculty Scholar in General Internal Medicine. He has written many books and articles in the field of medical artificial intelligence.

Bruce Buchanan, professor of Computer Science Research at Stanford University, has a B.A. in Mathematics and an M.A. and Ph.D. in Philosophy. He has been an instructor of Philosophy and a Research Associate in Computer Science. In addition he was a Research Computer Scientist, while holding a National Institutes of Health Career Development Award. Professor Buchanan's main line of research is in the class of artificial intelligence programs known as expert systems. He is co-principal investigator of the Heuristic Programming Project at Stanford, founding board member and membership chairman of the American Asosociation for Artificial Intelligence, and member of several editorial boards. He is co-author of two books, and has published numerous papers and review articles in a wide variety of books and journals.

Image Communications
08:30 - 17:00 Sunday 29 July 1984

Speaker: B. Prasada, Bell Northern Research

Content: This tutorial will be an introduction to classes of imagery (alpha-numeric, alpha-geometric, multi-level natural imagery, and dynamic multi-level), applications (TV distribution, video-conferencing, low-bit rate teleconferencing, document communications, image data base acccess, specialized applications), digital networks (digital transmission, digital switching), and motivation for coding. It will also cover image coding - problem statement, image and viewer properties, sampling, quantization, predictive coding/motion compensation, and transform coding; document communications and teleconfering systems (video, interactive, and network implications).

Biography: to come

Visual Inspection
08:30 - 12:00 Sunday 29 July 1984

Speaker: L. F. Pau, Battelle, Geneva

Content: t.b.a.

Biography: t.b.a.

Hardware for Image Processing
08:30 - 17:00 Sunday 29 July 1984

Speaker: M.J.B. Duff, University College, London

Content: This tutorial will review the broad classes of newly-developed computer architectures specialized for processing image data. A distinction will be drawn between

high-level language structures and computer hardware implementing them and will discuss the significance of attempts to 'hide' the computer structure from the user by raising the levels of the languages used. The ways in which knowledge of the architecture can influence the design of algorithms and also ways that algorithms can influence architecture will be considered. As well as describing the architecture now available, the tutorial will examine the problem of trying to benchmark performance of new architectures and show how misleading conclusions can be drawn unless great care is taken to design and describe the benchmarks. Finally, the increasing use of VLSI technology to implement image processing algorithms will be evaluated and an attempt made to compare the relative merits of general purpose programmability and hardware dedication.

Biography: to come

Introduction to Image Processing
08:30 - 17:00 Saturday 28 July 1984

Speaker: R. M. Haralick, Virginia Polytechnic Institute and State University

Content: This tutorial will introduce the participants to the concepts and techniques of digital image processing. The following topics will be included: digitization and quantization, smoothing, filtering, enhancement, restoration, edge detection and following, segmentation, transformations, registration, feature extraction, image analysis, data formats and storage, manipulation software, output techniques, and applications. In addition, a short survey of future directions and developments in image processing will also be presented.

Biography: Bob Haralick received undergraduate and graduate degrees from the University of Kansas, Lawrence in 1964, 1966, 1967 and 1969 respectively. He has worked at Autonetics and IBM. In 1965 he worked for the Center for Research, University of Kansas, as a Research Engineer and in 1969 he joined the faculty of the Department of Electrical Engineering, where he served as a professor from 1975 to 1978. In 1979 he joined the faculty of the Departments of Electrical Engineering and Computer Science, Virginia Polytechnic Institute and State Uniersity, Blacksburg, where he is now a Professor and Director of the Spatial Data Analysis Laboratory. He has done research in pattern recognition, multiimage processing, remote sensing, texture analysis, data compression, clustering, artificial intelligence, and general systems theory. He is responsible for the development of GIPSY (general image processing system), a multiimage processing package which runs on a minicomputer system.

Vision for Robots
13:30 - 17:00 Saturday 28 July 1984

Speaker: T. Kanade and J. Crowley, Carnegie-Mellon University

Content: This tutorial starts with introduction to the computational theory of vision in order to acquire three-dimensional scene information from images. Then, examples of 2D and 3D vision systems applications will be analyzed so that participants can understand where the basic difficulties exist in vision and how successful systems use natural and artificial constraints. Topics include early processing of images; representation and analysis of 2D and 3D shapes, state-of-the-art in commercial vision systems; and engineering principles for vision applicatons. While we deal with practical techniques, emphasis is also placed on new trends of computer vision; that is, Image Understanding approaches for understanding images as three-dimensional scenes.

Biographies: Dr. Kanade is as Associate Professor of Computer Science and a Senior Research Scientist at the Robotics Institute, Carnegie-Mellon University. He is currently the Principal Investigator of the DARPA Image Understanding project at CMU. Prior to joining the CMU faculty, he was an Associate Professor of Information Science and Research Associate at Kyoto University, Japan. Since 1969, he has developd and co-developed a human-face recognition system, a theory of the origami world and skewed symmetry, an interactive picture processing system, the 3-D Mosaic System, and the CMU DD Arm I. His current research interests include 3-D shape understanding from images, aerial photo interpretation, special 3-D range-sensors, and the CMU Direct-Drive Arm project.

Dr. Crowley is a Research Associate at the Robotics Institute where he is Principal Investigator of the project, "Guidance Control for a Mobile Household Robot". His current research interests include techniques for measuring, representing, and matching 2-D and 3-D shapes and developing hardware to support the fast interpretation of grey-scale images. Dr. Crowley holds a B.S. in Electrical Engineering from Southern Methodist University and a M.S. and Ph.D. in Electrical Engineering from Carnegie-Mellon University.

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CSCSI/SCEIO

10 February 1984

Dear CSCSI/SCEIO Member,

This issue of the Newsletter contains several items which will be of interest to CSCSI/SCEIO members and others alike. The long awaited summary of the questionnaire: "Directions for Canadian AI", which was distributed in long and short form last year to the membership of the CSCSI/SCEIO, is included. This summary contains an accurate, up-to-date overview of the many AI endeavours taking place in Canada today and should prove invaluable to AI researchers and others interested in the field. This document will also be available shortly as a separate report available from the CSCSI/SCEIO executive. We plan to distribute this report at the forthcoming Calgary CIPS Session '84 (9-11 May 1984), at the Fifth National Conference of the CSCSI/SCEIO in London, Ontario (15-17 May 1984 - see you all there), and at the CIAR/Science Council Conference in Ottawa (26-27 March 1984). Gordon and I are preparing a "Survey of AI in Canada" for AAAI Magazine based on this document.

The agenda for the CIAR/Science Council Conference and the invitation list of attendees are also enclosed for your information. Unlike the Science Council Workshop in January, 1983 the CSCSI/SCEIO was consulted. We were unable to affect either the program or the "invitation only" aspect; we did supply 30 names as requested by Dr. Bill Tatton, organiser of the Conference, and after further discussion travel funds were provided. The CSCSI/SCEIO will be taking the opportunity this Conference provides to put the CSCSI/SCEIO's name forward to the 200+ attendees, many of whom are from government and industry who are not aware of the CSCSI/SCEIO's activities. We will host a hospitality suite from 5-6:00 pm on the first day of the Conference where the CSCSI/SCEIO executive will be available.

Dr. Gordon MacNabb, President of NSERC, recently wrote a letter to the Science Council about several misrepresentations of NSERC's role in AI which were contained the the Science Council document reporting on the January, 1983 Workshop (this letter was copied to all participants and attendees). [This report is available from the Science Council by writing to them at 100 Metcalfe, Ottawa K1P 5M1 for a copy of "A Workshop on Artificial Intelligence", August, 1983]. A copy of that letter is included in this newsletter along with excerpts from my response to Dr. MacNabb and the Science Council. My response contained my personal reactions to points raised in Dr. MacNabb's letter (since I also attended the Workshop) and was not written to express any official CSCSI/SCEIO position.

A further update concerning the proposed Computational Studies of Intelligence (CSI) journal (see Newsletter volume 2, no. 2, Nov., 1983)! Gordon and I sent the prospectus (enclosed) and letters to 204 scholars, both Canadian and international, asking for their reactions to the journal and for their suggestions about its form and content. To date we have received over 100 responses with overwhelmingly positive reactions. We will soon be updating the prospectus, taking into account the comments we received and we will be sending this, along with a summary of the statistics we gathered to Dr. Claude Bishop, Editor in Chief, Research Journals at NRC which we hope will publish the journal.

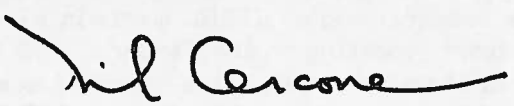
Earlier this year and in accordance with our Constitution, I appointed a nominating committee consisting of Bill Havens, Wayne Davis, and John Mylopoulos to suggest a slate of candidates to serve on the next CSCSI/SCEIO executive. They are! Gordon McCalla (chairman), John Tsotsos (vice-chairman), Mike Bauer (secretary), Wayne Davis (treasurer). If this slate is unsatisfactory, the Constitution provides for futher nominations from the membership. We are running a bit late so any such nomination should be on my desk by 16 March 1984. If any such nominations are received an election (by mail) will be held. The new executive will take office following the CSCSI/SCEIO general meeting this May.

At our annual meeting during the Fifth National Conference we must also decide where to hold the next Conference (in 1986). For your information the previous conferences were held in Ottawa (organising workshop in 1974), Vancouver (1976), Toronto (1978), Victoria (1980), Saskatoon (1982), and London, Ontario (1984). My choices for the next conference would include Montreal, Calgary, or Ottawa. Please give this some thought and speak your mind at the annual meeting.

Finally, while reading the responses to our questionnaire, we discovered that several individuals were unable to obtain copies of CSCSI/SCEIO Conference Proceeding from the CIPS National Office. If any of you have had similar experiences, we would appreciate hearing from you.

I wish to thank the membership for their cooperation and feedback over the past year. Such input is crucial at such an important juncture in AI in Canada.

Yours Sincerely,



Nick Cercone, Chairman CSCSI/SCEIO

enclosures

CSCSI/SCEIO

Directions for Canadian Artificial Intelligence

a report
produced by

Gordon McCalla and Nick Cercone

Canadian Society for Computational Studies
of Intelligence / Societe Canadienne pour
Etudes d'Intelligence par Ordinateur

CSCSI/SCEIO

Directions for Canadian Artificial Intelligence

a report
produced by

Gordon McCalla*
Nick Cercone**

Abstract

This report summarises the results of the CSCSI/SCEIO questionnaire distributed to the membership in 1983. This report represents a comprehensive overview of the state of artificial intelligence in Canada at the present time.

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Canadian Society for Computational Studies of Intelligence /
Societe Canadienne pour Etudes d'Intelligence par Ordinateur

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Gordon McCalla and Nick Cercone <15-Feb-84>

Preface

During the 1981 Annual Meeting of the CSCSI/SCEIO Alan Mackworth (then Chairman of the CSCSI/SCEIO) reminded the membership of Ted Elcock's and Zenon Pylyshyn's 1973 suggestion to NRC that a study be made of AI in Canada. The NRC declined the offer. Alan and Zenon conceived a study of AI in Canada. *1* The current CSCSI/SCEIO executive have completed an initial description of AI in Canada in response to a now apparent need that the voice of Canadian AI research be heard. In January, 1983 the Science Council of Canada held a Workshop on Artificial Intelligence in Ottawa. This workshop was attended by a selected number of academics, industry representatives, government consultants, and others. Because of the debate at and about this workshop the CSCSI/SCEIO decided to ask its membership to respond to a rather lengthy questionnaire concerning artificial intelligence, in particular Canadian AI efforts. The questionnaire was circulated via the Newsletter (vol 2, #1) in March, 1983. Poor response to the questionnaire prompted another, shorter questionnaire to be sent directly to the CSCSI/SCEIO membership. Response to this questionnaire was substantially better.

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1 The minutes of the 1981 Annual Meeting contain the following passage on AI in Canada:

> "In 1973, Ted Elcock and Zenon Pylyshyn suggested to NRC that a study be made of AI in Canada. This offer was declined. A. Mackworth suggeted resurrecting the idea, along the lines of the COSERS study in the U.S. Z. Pylyshyn agreed to assist. The size, coverage, and intended audience of the proposed report were discussed. The audience should include NSERC, NRC, Science Council, and the Ministries of Supply and Services, Energy Mine and Resources, Communications, and Science and Technology. The press would of course be sent the report as well. The consensus of the meeting was that the Executive should look into the detailed coverage of the report and approach individuals to do the work."

The Executive wanted to follow up on Alan's suggestion to resurrect the report on AI in Canada and also to keep Nick Cercone's promise (on behalf of the CSCSI/SCEIO) made to the Science Council of Canada during the January, 1983 Workshop. Nick promised to survey the CSCSI/SCEIO membership and produce a report on Directions for Canadian AI. Although the number of questionnaires we received was substantial, we nevertheless undertook a telephone campaign to try a third attempt to reach members who did not fill out the questionnaire. The telephone campaign paid handsome dividends and we were able to contact an additional 21 members. During the process of collating results from the questionnaire we made additional telephone calls to respondents and others to clarify possible misinterpretations. This report is a summary of all of the questionnaire responses.

Many people contributed to the final form of this document. The authors would like to acknowledge the following people, without whose help this report would have been severely delayed. We thank Josie Backhouse for telephoning the CSCSI/SCEIO membership and persisting until further questionnaire' responses were obtained. Josie also help to organise and collect data from the questionnaires. Mark Drew set up the plot files which enabled us to produce informative graphs for this report; we are indebted to Mark for this. We thank Carol Murchison for helping to edit the final report. We gratefully acknowledge the use of computing facilities of Simon Fraser University and in particular the Office of the Associate Academic Vice-President for helping to defray initial expenses. Finally, we wish to thank the CSCSI/SCEIO membership for their cooperation, for taking the time to complete the questionnaire, and for additional comments they supplied.

Gordon McCalla and Nick Cercone

February, 1984
Burnaby

CSCSI/SCEIO Questionnaire: Directions for Canadian AI ... page 1

Gordon McCalla and Nick Cercone <15-Feb-84>

1. Introduction

These are exciting times for artificial intelligence (AI). Internationally, there are major projects underway which emphasise AI, among them Japan's 5th generation project, Britain's advanced technology programme, the ESPRIT project in Europe, and a number of major U.S. endeavours. Canada is also becoming increasingly interested in AI. The Natural Sciences and Engineering research Council (NSERC) of Canada is becoming aware of AI and treating AI researcher's requests for funding more seriously than before, through its operating, equipment, and strategic grant programmes. The Canadian Institute for Advanced Research (CIAR), a privately endowed foundation, has launched a well funded, three university (British Columbia, Toronto, McGill) five to ten year effort in interdisciplinary research conjoining robotics, neurophysiology, artificial intelligence, and some areas of the social sciences and humanities. The Science Council of Canada has hosted a Workshop on AI last year and with the CIAR is co-hosting an AI conference during 1984. Their conference will bring together AI researchers, government and industry officials, and the media. The CSCSI/SCEIO welcomes an increasing number of participants to its biennial National Conference. Other projects are being contemplated by the CSCSI/SCEIO.

The Canadian AI research community is small compared with AI communities elsewhere in the world. It is in our interests and Canada's interests that we work together to make sure that decision makers involved with AI projects receive informed opinion about Canadian AI. They should be familiar with our expertise, Canadian AI's current and potential achievements, and the theoretical and other difficulties confronting AI in Canada. We hope this document will begin progress towards this objective. We also hope it will stimulate thought about possible future directions and will launch a lively open discussion about the next steps for Canadian AI.

There are approximately 280 members of the CSCSI/SCEIO. All members were sent questionnaires and we received 60 responses representing 103 individuals. Although most of the responses came from CSCSI/SCEIO members, two respondees were not members. The 60 responses can be separated into: 6 responses from the original questionnaire and 54 responses from the shorter questionnaire. Of these 54 responses, 33 were mailed in and 21 were the result of a follow-up telephone campaign. The responses can be illustrated geographically and by type and kind as shown in Table 1.

We summarise AI research in Canada in Section 2 by methodology and geography; we indicate the scope and range of projects under development in universities, industry, and government laboratories. In section 3 we present the results and opinions from the questionnaires, discussing financial support for AI in Canada, strategies for AI research and the role of the CSCSI/SCEIO. Our concluding remarks summarise this document and present a brief overview of the CSCSI/SCEIO, its past and present accomplishments, and future plans. Finally the Appendices present a plethora of information, from the (short-form) questionnaire in Appendix 1 to a list of expatriate Canadians working in AI in Appendix 5.

ALPHABETICALLY

Province or Place	Number: (L indicates long (orig) quest.; S for short quest.; P for phoned questionnaire)			Kind: A-Academic N-Non-Academ.		Responses/ total # of people represented
Alberta		5 (S)	4 (P)	6 (A)	3 (N)	9 / 13
British Columbia	1 (L)	10 (S)	3 (P)	9 (A)	5 (N)	14 / 21
Saskatchewan	1 (L)		3 (P)	4 (A)		4 / 9
Manitoba	1 (L)			1 (A)		1 / 1
Ontario	2 (L)	14 (S)	6 (P)	15 (A)	7 (N)	22 / 43
Quebec		2 (S)	1 (P)	3 (A)		3 / 4
Nova Scotia			1 (P)	1 (A)		1 / 1
Other	1 (L)	2 (S)	3 (P)		6 (N)	6 / 11
Totals . . .	6 (L)	33 (S)	21 (P)	39 (A)	22 (N)	60 /103

GEOGRAPHICALLY

British Columbia	1 (L)	10 (S)	3 (P)	9 (A)	5 (N)	14 / 21
Prairies						
Alberta		5 (S)	4 (P)	6 (A)	3 (N)	9 / 13
Saskatchewan	1 (L)		3 (P)	4 (A)		4 / 9
Manitoba	1 (L)			1 (A)		1 / 1
subtotals . . .	2 (L)	5 (S)	7 (P)	11 (A)	3 (N)	14 / 23
Eastern Provinces						
Ontario	2 (L)	14 (S)	6 (P)	15 (A)	7 (N)	22 / 43
Quebec		2 (S)	1 (P)	3 (A)		3 / 4
subtotals . . .	2 (L)	16 (S)	7 (P)	18 (A)	7 (N)	25 / 47
Nova Scotia			1 (P)	1 (A)		1 / 1
Other	1 (L)	2 (S)	3 (P)		6 (N)	6 / 11
Totals . . .	6 (L)	33 (S)	21 (P)	39 (A)	22 (N)	60 /103

Table 1. Summary of Responses.

2. Summary of AI Research in Canada

2.1 Methodology and Geography

Most Canadian AI research is carried out in universities (primarily in computer science departments), with only a small amount of research being pursued in government laboratories or in private industry. AI research and development is fairly evenly distributed across the country, with approximately as many AI researchers in the west as in the east, though there are fewer AI researchers in the maritimes (Table 1).

We summarise Canadian AI research efforts as reflected by the questionnaires and information derived from other sources. In a geographical organisation Appendix 2 summarises the AI interests of questionnaire respondents and includes descriptions of work of other researchers. A cross-reference from areas of interest to researchers is contained in Appendix 3. In the discussion below we place the various research and development endeavours within the Canadian national AI context. While we have attempted to be as complete as possible, we may have inadvertently mispresented or missed some piece of research; for this we apologise.

Two universities have emphasized AI over the years to the extent of engaging professors who specialise in AI research and graduate AI Ph.D. candidates. The University of British Columbia (UBC) in Vancouver currently has five professors with primary interest in AI, over 20 AI-oriented graduate students, and several main research directions including computational vision, natural language understanding, and representation of knowledge. UBC is the home of the Laboratory for Computational Vision which provides facilities and co-ordination to the computational vision research effort. The University of Toronto (UT) currently has four professors with

full-time AI interests, several professors with at least peripheral interest, and approximately 30 AI-oriented graduate students. Toronto's research areas include representation of knowledge, natural language understanding, computer vision, and medical expert systems. AI faculty at Toronto are members of the Computer Systems Research Group which provides facilities to many experimentally oriented computer science research projects.

Four other universities also have made significant commitments to AI. The University of Alberta (UA) in Edmonton has five professors with at least some AI orientation, interested in topics such as representation of knowledge, natural language understanding, game playing, image processing, adaptive systems, and cognitive science. Simon Fraser University's (SFU) young computing science department has five faculty with AI interests ranging from natural language understanding and representation of knowledge through logic programming and computer vision. SFU's Laboratory for Computer-Communications Research supports a number of projects including a major AI project: the automated academic advisor. Montreal's McGill University has AI research ongoing both in the computer science department with research into game playing and in its electrical engineering department with several professors researching computer vision. At the University of Western Ontario in London, Ontario, there are researchers in the computer science department investigating logic programming, software engineering for AI, and robotics; and in the psychology department pursuing topics in cognitive science, co-ordinated through the Centre for Cognitive Science.

Other universities who haven't historically concentrated on AI are currently increasing their activity in the field. Many of these places will be discussed in the following descriptions of the different AI research areas being investigated in

Canada. Graph 1 shows the relative concentrations on the various areas in Canada as extracted from the cross-reference list in Appendix 3.

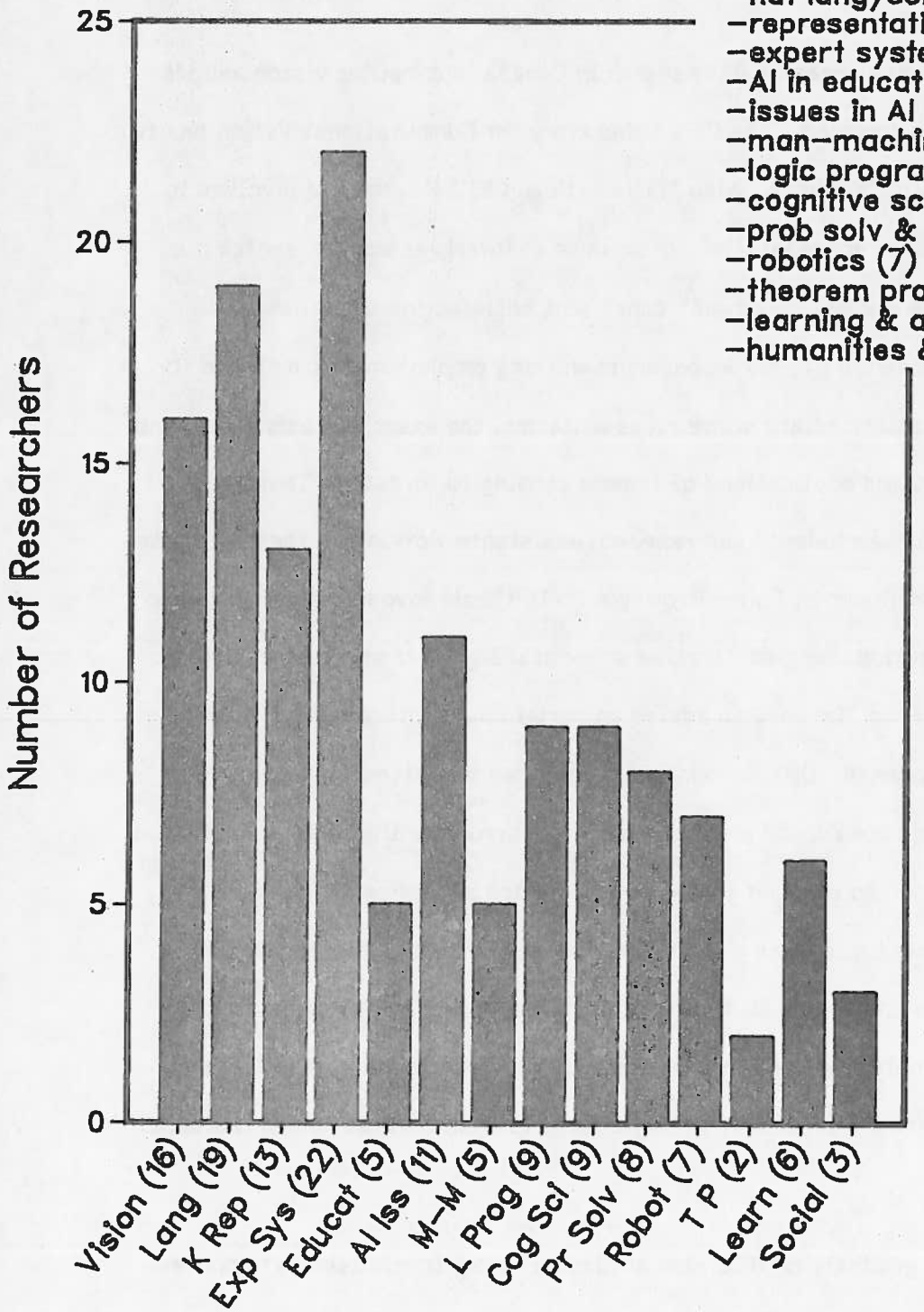
2.2 Computer Vision and Image Processing

One of the most active areas of AI research in Canada is computer vision and its allied field of image processing. The UBC Laboratory for Computational Vision has two main research thrusts in this area. Alan Mackworth and Bill Havens are involved in the use of schema-based representation formalisms to interpret scenes, sketch map understanding (and the Mapsee2 program), constraint satisfaction in scenes, and applications in remote sensing. Bob Woodham is working on photometric methods for computational vision, intermediate scene representation, the exact representation and enhancement of colour, and applications of remote sensing to forestry. There have been a number of graduate students and research assistants working on these projects over the years. Now at Queen's, Roger Browse's Ph.D. thesis investigated knowledge based visual interpretation using declarative schemata. Jay Glicksman's thesis topic involved using output from Mapsee2 to advise an aerial image interpreter. Glicksman is now at Texas Instruments. Bill Havens in his Ph.D. work devised the knowledge representation language MAYA and proposed a control structure that allowed top-down and bottom-up knowledge to interact in the interpretation of scenes. A number of other students will soon finish among them Jan Mulder, working on hierarchical constraint satisfaction applied to sketch map interpretation; Frank Wong, exploring the rectification of remotely sensed images using digital terrain models; and Jim Little who is investigating the reconstruction of objects from their extended Gaussian images.

Brian Funt, a Ph.D. graduate of UBC now at Simon Fraser, specialises in computer vision. For some years he has been investigating how to use a parallel processing

Areas of Research Interest

Division label abbreviations represent:
- –comp vision/image proc/pat rec (16)
- –nat lang/comp ling/speech (19)
- –representation of knowledge (13)
- –expert systems/applications (22)
- –AI in education (5)
- –issues in AI programming (11)
- –man–machine interfaces (5)
- –logic programming (9)
- –cognitive science (9)
- –prob solv & search: plan, games (8)
- –robotics (7)
- –theorem proving (2)
- –learning & adaptive sys(6)
- –humanities & social issues (3)



retina for perception and reasoning. Early experiments involved use of the retina to predict configurations of falling blocks. He is currently looking at automatic wire routing using diagrams in conjunction with this retina. Funt is also investigating the automatic interpretation of CT-scan images of sawlogs and the generalisation of 2-D retinex colour perception theory to 3-D.

John Tsotsos, a graduate of and professor at Toronto, is also interested in computer vision. He has been investigating the automatic interpretation of x-ray images of heart motion in order to recognise irregularities. The Alven expert system assesses performance of the human heart's left ventricle. Knowledge representation techniques (borrowed in part from the Toronto "procedural semantic network" project) have been instrumental in his approach. More recently John and his soon to be finished Ph.D. student Tetsutaro Shibahara have been investigating a knowledge based approach to discovering arrythmias from electrocardiograms. The CAA system implements their approach. They are particularly interested in causality, event prediction, and the projection as a transduction mechanism between two knowledge bases. Former Toronto graduate students interested in matters pertaining to computer vision are Dick Peacocke, now at Bell-Northern Research in Ottawa, who devised a picture processing formalism (a preliminary step en route to a picture processing programming language) for his Ph.D.; and Norm Badler, now at the University of Pennsylvania, who studied motion understanding for his dissertation.

Another major effort in computer vision is underway at McGill, focussed in the electrical engineering department. Steve Zucker does highly regarded research into mechanisms for human visual perception, and along with Martin Levine is exploring the use of robotics for inspection and repair of hybrid circuits. Zucker's relaxation labelling and theory of continuous relaxation are well entrenced in the computer vision area. In addition, Levine is undertaking research in computer vision and

visual perception as applied to various biomedical applications. McGill's Computer Vision and Graphics Laboratory have V. Agarwal, H. Lee, and A. Malowany working with Zucker and Levine, and the lab provides the research facilities for a number of graduate students working under their supervision.

Roger Browse and Jeff Kulick and their colleagues at Queens University in Kingston, Ontario, are interested in computational models of visual attention, foveation, and reading; edge detection and grouping in image understanding; and medical imaging systems for 3-D tomography.

Image processing investigations at the National Research Council's Ottawa Laboratories include: Tony Kasvand studying image processing as applied to the analysis of complex line structures; N. Abdelmalek's studying restoration and compression of images; C. Merritt analysing vegetable chromosomes; and S. Hueng studying binary lines. Visiting researchers also contribute to image processing at NRC.

Wayne Davis at Alberta is studying formats and storage techniques for spatial data and the the analysis and enhancement of medical images. Larry Paul in the pathology department at UBC is working in biomedical applications of computer vision, in particular representing 2-D and 3-D properties of biological specimens. Morris Goldberg in the University of Ottawa's electrical engineering department is working with others to develop an expert system for analyzing remotely sensed images of forests. Tom Calvert, dean of interdisciplinary studies at Simon Fraser, in addition to his long term involvement in computer interpretation of Labanotation and animation of dance, has more recently become interested in aspects of computer vision for a mobile robot.

2.3 Natural Language Understanding and Computational Linguistics

Computational linguistics, particularly natural language understanding, is another area of longstanding Canadian expertise. In this field also, Toronto's contributions are substantial. John Mylopoulos supervised the initiation over ten years ago of the TORUS (TORonto Understanding System) project. This investigation into constructing a knowledge-based natural language front-end to a database of student records has since evolved into investigations into both natural language and knowledge representation. Working on the TORUS project initiated many graduate students into natural language understanding. Most of the more recent Toronto efforts in computational linguistics have been oriented towards the semantics and pragmatics of natural language. Ray Perrault (now at Stanford Research International) and his Ph.D. students Phil Cohen (now at Fairchild Laboratory for AI Research) and James Allen (now at Rochester University) and others formulated an approach to understanding natural language dialogue based on showing how the participants in a dialogue take into account each other's beliefs during a conversation. In particular this research illustrated how dialogue participants plan their own speech acts and recognise each other's plans in order to communicate with each other. Robin Cohen's recently completed Ph.D. thesis continued the Toronto interest in natural language pragmatics, investigating how various structures give coherence to arguments. Graeme Hirst, a recent addition to Toronto's faculty from Brown University, is also involved with natural language, specifically knowledge representation techniques to help semantic interpretation and ambiguity resolution, and parsing. His M.Sc. thesis completed some time ago at UBC and now published as a Springer-Verlag book, is an entertaining compendium of anaphora examples. One other Toronto computational linguistics effort was Alex Borgida's Ph.D. research which formalised Gleason's linguistic theory. Alex is now at Rutgers University.

Alberta has also been involved in natural language understanding research. Starting a number of years ago under Jeff Sampson's tutelage, and more recently under Len Schubert's eagle eyed direction, a number of natural language oriented research projects have evolved. One theme that runs through the research is the use of semantic network representations in natural language understanding. Len's pioneering effort to extend the expressive power of semantic networks were used by Nick Cercone during his Ph.D. work to develop a state-based representation for factual knowledge. More recently, Len has renewed an interest in parsing. His projects include preference parsing of generalised phrase structure grammars (and logical interpretation), general and special purpose inference for a question answering system, and speech generation.

Involvement in natural language understanding is growing at Simon Fraser University. Nick Cercone has continued his interest in natural language and semantic networks first sparked as a Ph.D. student at Alberta. Working with a number of graduate students, he is also devising perfect hash functions which will improve access to large natural language lexicons. With Paul McFetridge and Tom Strzalkowski (PhD student), Nick is parsing with extended cascaded augmented transition networks. This is part of one competing prototype of constructing a natural language interface to academic records for use in the "automated academic advisor" (AAA) system. The AAA is a large ongoing project aimed at giving university administrators and others on-line access to appropriate academic data. The social and organisational impact of such information-communication systems is being investigated. Veronica Dahl, another professor at SFU, has devised the L3 parsing system to translate Spanish into logic (using Prolog) and continues active investigations into many areas of parsing. Bob Hadley, a recent addition to SFU's faculty, is also interested in parsing using Prolog, specifically the interpretation of ambiguous quantified statements.

UBC has had an ongoing interest in natural language understanding for a number of years. Richard Rosenberg has been involved in a number of research efforts in the semantics and pragmatics of natural language, in particular work on case-based parsing, Hirst's anaphora investigations, and Gord McCalla's Ph.D. research on representation techniques for natural language conversation. Recently Richard and his soon to be finished Ph.D. student Bob Mercer have been investigating the computation of presuppositions to natural language sentences.

Another longstanding effort in computational linguistics is the machine translation project underway until recently in the departmente de linguistique at Universite de Montreal. Richard Kittredge and Igor Mel'cuk were interested in translating between French and English, and achieved considerable success in the translation of weather reports. Now interested in generalising beyond the weather report domain, Kittredge and Mel'cuk are currently investigating the tractability of various other sublanguages of English and French, and are also looking at the generation of text fragments from semantic networks in such narrow sublanguages (using Prolog).

Speech understanding, although not strictly part of computational linguistics, is being investigated by some researchers, notably Renato di Mori at Concordia University. Ching Suen is interested in speech synthesis, in addition to his work on character recognition. Other people expressing an interest in aspects of computational linguistics are Ernie Chang (University of Victoria), David Curran (Vancouver), Renee Elio (Alberta Research Council in Edmonton), Wendy Moore (UBC), and Wilf Lalonde (Carleton University in Ottawa).

2.4 Representation of Knowledge

Reflecting its central role in AI, representation of knowledge has been widely

studied by Canadian AI researchers. A great many people mentioned knowledge representation as an interest on the questionnaires. We will not list them all here, instead preferring to emphasize those whose primary focus is knowledge representation.

In the mid-seventies, Len Schubert and his Ph.D. student Nick Cercone at Alberta led an effort to extend and formalise semantic networks. Subsequently, Len carried on this effort with the help of a number of graduate students at Alberta, and Nick continued to collaborate from Simon Fraser. This project not only made many standard concepts (such as ISA, type vs token, etc.) more precise, but also introduced quantifiers into semantic networks, precise concepts of scope, the idea of topic hierarchies to organise the information in the network, and a number of other enhancements.

A similar project got underway at Toronto in the mid seventies as an outgrowth of lessons learned in the TORUS project (see section 2.2). John Mylopoulos directed this effort to formulate precise procedural semantics for semantic networks. Eventually, the "procedural semantic network" (PSN) system was developed to, among other things, organise networks along several different hierarchies (ISA, PART-OF, context); to define several different types of nodes including instances, classes, and meta-classes (dubbed an "instance" hierarchy); to introduce precise semantics into the process of inheritance; and to attach specific procedures to each class indicating how to insert, remove, fetch, and test (the existence of) instances of the class. More recently the representation effort has branched in a number of directions, including the creation of a layered PSN knowledge representation programming language, the use of PSN ideas in the medical systems being developed by Tsotsos et al, and the formulation of logical approaches to the representation of certain concepts which originally arose in PSN. A number of Ph.D. students explored various of these directions, including

Hector Levesque (now at Fairchild Laboratory for AI Research) who worked out a non-monotonic logic approach to incomplete knowledge; and two students who have nearly completed their theses: Jim Delgrande who is working out a logical approach to theory formation and conjecturing in knowledge bases; and Bryan Kramer who is examining reflection in knowledge bases and the representation of control knowledge. John Mylopoulos also heads up the TAXIS project which incorporates a number of AI representation ideas into the design of databases.

Ray Reiter at UBC is one of Canada's outstanding AI researchers and has made major contributions to knowledge representation over the past decade. He was an early champion of logical formalisms for representation and was one of the pioneers of what now has become known as non-montonic logic. He has particularly been interested in the closed world assumption for the treatment of negation in knowledge bases (default logic) and in logical formalisms of database theory. He has had two Ph.D. students interested in knowledge representation, including Brian Funt (now at SFU) who investigated non-propositional "analogical" representations (using a parallel processing retina such as the one mentioned in section 2.2), and Randy Goebel (now at Waterloo) who is almost finished his thesis on the representation and use of descriptions in knowledge bases. Also at UBC are Bill Havens and Alan Mackworth whose interest in knowledge representation for vision was discussed in section 2.2.

Doug Skuce, currently at Ottawa, received his Ph.D. from McGill for devising the general purpose knowledge representation language LESK ("Language for Exactly Stating Knowledge"). Doug has more recently become interested in compiling LESK into another language of his design: the logical language KNOWLOG (based on Prolog). He is investigating the use of KNOWLOG in expert systems and natural language applications.

2.5 Expert Systems and Applications

Many researchers whose work we describe under other labels are also involved in developing practical applications. We will not re-iterate their names here. Instead we will concentrate on those whose major focus is the application itself or expert systems technology.

Ernie Chang at Victoria is developing LISP-based expert systems to interpret liver function tests and is using an ATN interpreter to help structure man-machine dialogues occurring in several video disk applications in hematology. He is also interested in theoretical aspects of expert systems including using the utility function approach in selecting the next test and the compilation of production rules from descriptive knowledge bases.

Peter Rowat, a graduate from UBC's AI group now heading his own company Dogwood AI Research, has moved on from the problem solving and robotics focii of his Ph.D. to the development of expert systems for forest management and avalanche control. He is particularly interested in how planning and reasoning about time can be usefully incorporated into these applications.

Alan Campbell, now in Smithers, B.C., is elaborating on his Stanford work on PROSPECTOR (the expert system for seeking out mineral deposits). In the context of PROSPECTOR he is investigating general expert system frameworks that will work on micro-computers (particularly the IBM-PC).

John Tsotsos at Toronto has been involved in the CAA and Alven medical expert systems mentioned in section 2.2 and has also launched the HIPPOCRATES second generation medical consultant. Renee Elio at the Alberta Research Council has begun work on a meterological expert system to help forecast storms. Others expressing an

explicit interest in expert systems are Brian Unger (University of Calgary); Mike Bauer (University of Western Ontario); Michael Burke (AES Data, Missisauga, Ontario); Janice Glasgow (Queens); Morris Goldberg (Ottawa); and Doug Skuce (Ottawa).

An application area of particular interest in Canada is the use of AI techniques and approaches in education. One focus of activity is at the University of Saskatchewan in Saskatoon. Gord McCalla has been experimenting (through the construction of a small LISP course) with the use of AND/OR graphs to structure courses, work that possibly has implications for the design of authoring languages. He is (with Darwyn Peachey) interested in how to automatically plan courses individualised for particular students and dynamically replan them to overcome misconceptions that arise. Dave Goforth, also at Saskatchewan, has designed, has implemented, and is experimenting with the programming language LEPUS created to allow students to participate in LOGO-style "student initiative learning" in non-mathematical domains, particularly domains involving the interaction of multiple entities in various environments. Marlene Colbourn, during her years at Saskatchewan before going to Waterloo University, developed an expert system that helps to diagnose children's learning and reading disabilities.

Gerald Rambally has recently joined the faculty at University of Regina where he is pursuing computers and education interests developed as a graduate student at University of Oregon. There has been work at UBC on intelligent tutoring under the supervision of Richard Rosenberg and others. Ivan Tomek at Acadia University in Wolfville, Nova Scotia, has developed Josef, an educational programming language similar in aim to Karel the Robot Simulator. There are computers in education interests at Alberta, Ontario Institute for Studies in Education in Toronto, and many, many other places. These efforts aren't particularly oriented towards AI.

2.6 Issues in AI Programming, Man-Machine Interfaces, and Logic Programming

Canadian research is investigating programming languages and environments for AI. Wilf Lalonde at Carleton is developing an actor machine for use in AI. He is also looking at possible applications based on the actor paradigm.

At Western Ontario several people are interested in aspects of AI programming. Mike Bauer, for his Ph.D. at Toronto, investigated how programs could be induced from traces of their output. Now at Western, he is exploring how to build software development experts to aid in the design, specification, and testing of software. He is particularly interested in the use of Prolog as a specification/prototyping language. Mike is also involved in sophisticated interfaces for office systems. D. Julian M. Davies developed the POPLAR 1.5 AI programming language. His work at Western includes programming languages and networks. Ted Elcock, also at Western, is interested in the relationship between logic and computing, and in particular the potential role of logic in a good software methodology.

At Waterloo a significant effort is underway in logic programming. Martin van Emden has been involved for some time in logic programming, and more recently Randy Goebel joined the faculty with his interests in DLOG, a logic oriented representation language. One of the projects underway is the construction of Waterloo UNIX Prolog. Veronica Dahl pursues an interest in logic programming at Simon Fraser. She is constructing Prolog-based representations of grammars. Doug Skuce (Ottawa) in addition to developing his KNOWLOG language, is investigating intelligent backtracking in first order logic deduction. Stan Matwin is collaborating with Doug on some of his projects. Tomasz Pietrzkowski of Acadia is interested in logic programming, as well as architectures for computer graphics and AI.

A concentration of researchers interested in man-machine interfaces can be found at Calgary in the Man-Machine Systems Laboratory. Brian Unger, director of project JADE, is investigating simulation and modelling, prototyping, and expert systems. John Cleary is working on distributed evaluation of logic programs based on message passing, and use of this to support intelligent understanding of simulation traces. Bob Bramwell is interested in LISP and other symbol manipulation languages as well as user interfaces (specifically on-line documentation systems). David Hill, Ian Witten, Brian Wyvill and others contribute to projects related to JADE.

Bell-Northern Research in Ottawa is doing some work on software and man-machine interfaces. Dick Peacocke and his large group are involved principally with "mainstream" software engineering but are also interested in possible AI applications. James Bradford is working on ATN-based man-machine interfaces for various CAD/CAM applications.

Others having involvement with some aspects of AI programming or interfaces include Sol Greenspan whose Toronto Ph.D. investigated a knowledge representation approach to requirements modelling. Greenspan continues to pursue his interests in the application of AI to software engineering on the faculty of Toronto. Michel Pilote's Toronto Ph.D. thesis extended the TAXIS language so it could be used to describe the problem domain and the user interface. Tuncer Oren at Ottawa is involved in applications of AI software. Sharan Javey of York University is also interested in software design methods. Elio Renee at the Alberta Research Council is involved with intelligent interfaces. Gerald Turnquist at The Co-operators in Vancouver is interested in LISP.

2.7 Cognitive Science

A number of researchers have interests in cognitive science. Zenon Pylyshyn in the psychology department at Western Ontario has been a major player in Canadian AI for some years. His wide ranging cognitive science interests are now focussed in the Centre for Cognitive Science recently established at Western Ontario.

Julian Davies, also of Western, has been interested in the characteristics of emotional robots. George Baylor, Montreal, is trying to understand mechanisms underlying dreams. Roger Browse and a number of psychologists (Brian Bultler, Susan Lederman, Ian Morrison) at Queens are working in the area of cognitive modelling, including cognitive aspects of vision and perception. Kelly Wilson at Alberta has been interested in interactions between computing science and cognitive psycology for many years. Kelly has written a book From Association to Structure on this topic. Others expressing an interest in aspects of cognitive science are Brian Funt (Simon Fraser), John Cleary (Calgary), Gerald Rambally (Regina), Larry Rendell (University of Guelph), and James Bradford (Bell Northern Research). There are doubtless many more people involved in cognitive science, especially in psychology departments across the country. Unfortunately we have not heard from them.

2.8 Problem Solving and Search: Planning, Robotics, Theorem Proving, Game Playing

There is surprisingly little work on the general area of problem solving and search in AI. Planning was a major component of the Perrault-Cohen-Allen natural language effort at Toronto (section 2.3). Gord McCalla, in a project started at Toronto and continued at Saskatchewan, has investigated plan creation, plan execution, knowledge acquistion, and error recovery in a dynamic geographic microworld, work

which may prove relevant in the course planning project mentioned earlier. Peter Rowat (Dogwood AI) worked on robot problem solving for his Ph.D. research at UBC. Bob Hadley (Simon Fraser) is interested in very general problem solving. Reid Smith (formerly of Defence Research Establishment Atlantic now at Schlumberger-Doll Research in Connecticut) developed during his Stanford Ph.D. the contract net formalism for distributed problem solving. Larry Rendell's Waterloo Ph.D. investigated an adaptive plan for state space problems.

In the area of robotics, Richard Gordon (University of Manitoba) is investigating automated robotics techniques for early detection of melanoma and controlling x-ray microbeam. Susan Lederman and others at Queens are working on robot perception (visual, tactile, kinesthetic), especially using parallel processors. James Bradford (at Bell Northern Research) is interested in robot sensors. Martin Levine and Steve Zucker at McGill are (as mentioned in section 2.2) exploring the use of robotics for inspection and repair of hybrid circuits. Tom Calvert's work at Simon Fraser on the kinesthetics of dance has implications in robotics as his recent involvement with computer vision for mobile robots indicates. Len Schubert at Alberta is working with a Heathkit robot trying to equip it with touch sensors and use their improved range finder to enhance its planning capabilities. There is other "mainstream" robotics work which is being carried on in electrical engineering departments, government research laboratories, and the private sector, but these seem to make little use of AI techniques.

Another area with Canadian expertise is theorem proving. Ted Elcock and Donald Keuhner at Western Ontario have been interested in theorem proving for some time as has Tomasz Pietrzkowski at Acadia and formerly at Waterloo. Waterloo has also produced a number of Ph.D. graduates in this area, including Phil Cox (now in New

Zealand) and Lew Baxter who went on to York. Many people whose early interests were in theorem proving are now also interested in logic programming (including Ted Elcock, Tomasz Pietrzkowski, Ray Reiter, and others).

Game playing research is also carried out in several places in Canada. Two of the more prominent names in this area are Tony Marsland (Alberta) and Monroe Newborn (McGill). Both have created chess playing programs which play with considerable skill. Julian Davies at Western also expresses an interest in game playing, and Martin van Emden at Waterloo has used Prolog in implementing strategies for chess endgames. No doubt many others are interested in this topic, although none indicated this on the questionnaire.

2.9 Learning and Adaptive Systems

An area of growing interest in AI is learning. Larry Rendell of Guelph is perhaps most prominent in this area. He has been very active in exploring a number of topics, including inductive inference, particularly from elementary data in search; genetic systems; and the unification of various approaches to generalisation. Gord McCalla at Saskatchewan has supervised work on learning procedures and data structures, and has investigated the automatic acquisition of episodic knowledge in dialogue systems as well as acquisition of route information in the geographic planning system. Wilf Lalonde at Carleton is interested in the learning of natural language. Two nearly completed Ph.D. theses also are investigating topics in learning: Jim Delgrande's work (mentioned in section 2.4) on automatic theory construction, and expatriate Canadian Bob Holte's work on constructing machines to be able to keep up with changing facts and demands. Bob is currently a Ph.D. student at Brunel (in Britain).

Adaptive systems is related to learning, but has different theoretical underpinnings. Several Canadian professors have trained in this area at the University of Michigan under John Holland's supervision, but have since strayed from the adaptive systems path. One that hasn't is Jeff Sampson at Alberta who is still helping to elaborate the theory of adaptive systems and has written a widely read book on the subject. Jeff Sampson supervised Anne Brindle's Ph.D. thesis. She is now in California. John Cleary at Calgary is aiming to achieve a VLSI realisation of parallel adaptive systems.

It is highly probable that there will be vastly increased Canadian interest in the problem of learning as it becomes a more prominent AI issue.

2.10 Computers and the Humanities - Social Issues

There is some interest in Canada in the relationship of AI to other areas and to society. Nick Cercone and Carol Murchison at Simon Fraser have been compiling an annotated bibiography of computer-based literary and linguistic studies. Richard Rosenberg of UBC has had longstanding concern for the social implications of AI, and has recently written a book on the social issues of computing with many aspects pertinent to AI. David Curran of Vancouver has written a number of documents on privacy and other social issues. Needless to say, many scientists, both within AI and elsewhere, feel that it is important to be aware of the social implications of their work.

3. Directions for Canadian AI — Opinions from the Questionnaire

3.1 Methodology

In this section the results of the questionnaire (Appendix 1) are summarised. We integrated into one "lump" the responses from the long questionnaire and the written and phone responses to the short questionnaire. We then sub-divided this lump into: academics residing within Canada (dubbed "academics") and all other people (dubbed "non-academics"). Non-academics mostly consist of individuals in private industry within Canada, but also includes personnel of government laboratories, private research laboratories, and people residing in the United States or overseas. It was felt that the vast majority of Canadian AI research is being undertaken in the universities and we wanted to single out this group to see if they held any substantially different views from the rest. The division is fairly arbitrary, and the distinctions in viewpoint between the two groups have turned out to be fairly subtle (except where explicitly indicated below), but it seemed important nevertheless to keep the data separated in this explication.

We explain the results of parts 2, 3, and 4 of the questionnaire in turn below. Accompanying the verbal description of the results are graphs outlining the percentages of respondents picking a particular answer in each of three categories: academics, non-academics, and overall. The academic percentages were computed out of 39, the number of Canadian academics who answered the questionnaire; the non-academic percentages were computed out of 21, the number of other respondents; and the overall percentages were calculated out of 60, the total number of respondents to the questionnaire. Since respondents often made several choices to a question (or no choices), the percentages don't normally add up to 100 percent in any category. In

the graphs, the overall percentages are represented by the solid bar on the left, the academic percentages by the cross-hatched bar in the middle, and the non-academic percentages by the striped bar on the right. Tables of the actual percentages are in Appendix 4.

Also quoted at length below are remarks made on the questionnaires by respondents. We have attempted to pigeon-hole the comments opposite the appropriate question on the questionnaire. No comment is quoted more than once, even if it has relevance to several points. Not every remark made on the questionnaires has been quoted. We hope we have done justice to the feelings of the respondents and haven't misrepresented anyone's opinions by quoting out of context or in the wrong place.

3.2 Part 2 - Financial Support

In part 2 of the questionnaire respondents were asked to comment on various aspects of funding for AI in Canada. Needless to say, most people felt that current levels of funding were inadequate, although 2 respondents didn't agree. As one of them put it: "more people are the first need - throwing money [at a problem without the people] wouldn't necessarily help much". Others found the question difficult to answer due to their lack of knowledge of the costs of doing AI, disinterest in the question, or a feeling that specific projects should be set first before discussing funding.

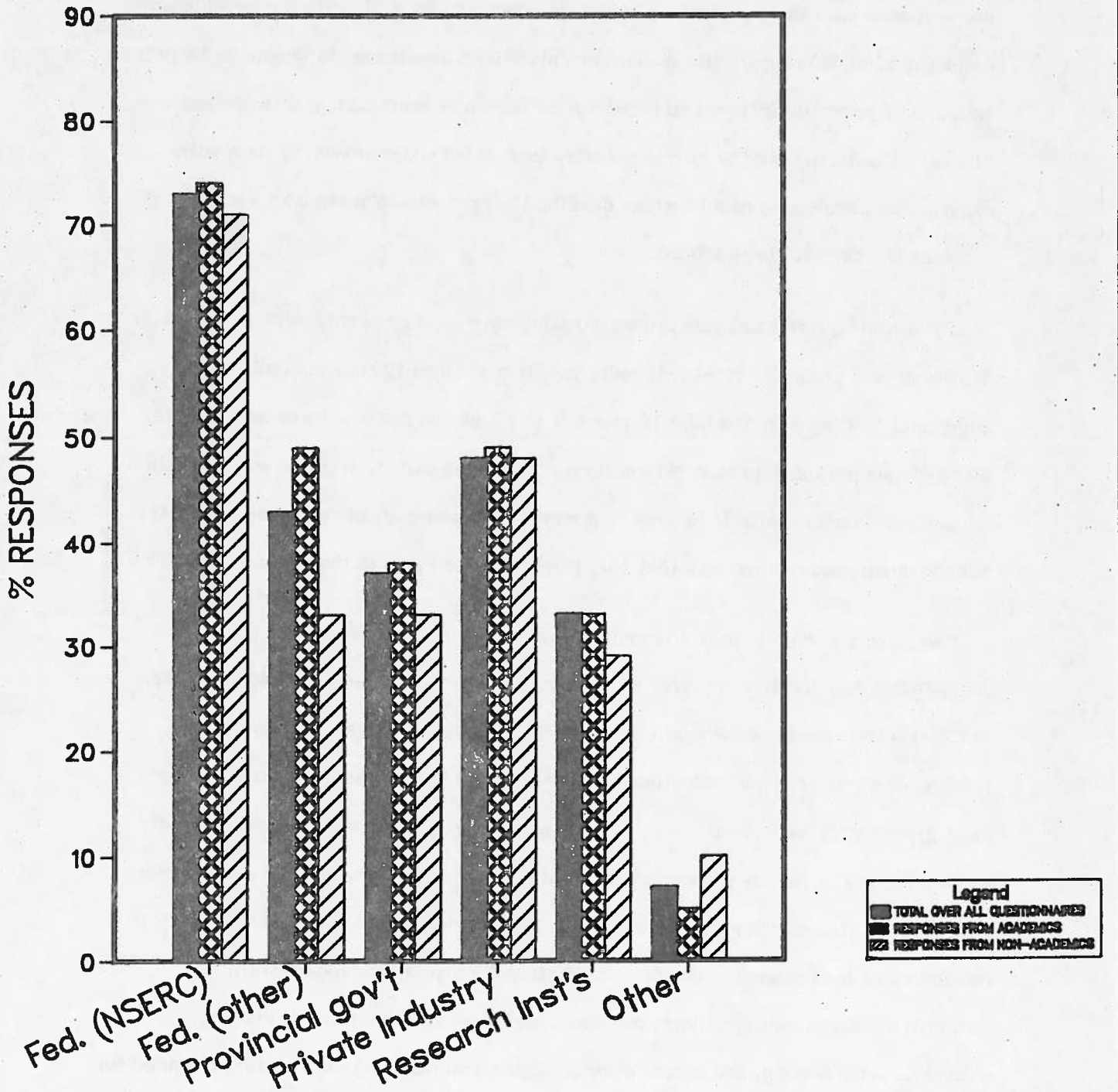
The findings of the survey about funding are outlined in graphs 2 through 5. They indicate that NSERC is the agency of choice for distributing funds, that an additional 10 to 100 million dollars should be allocated to AI over the next decade, that AI should be supported in conjunction with other areas, and that equipment is the major priority (followed closely by release time for current researchers, additional support staff, and extra researchers). Lets look at each question in more detail.

The first question in part 2 asked about who should provide funds for AI research in Canada (see graph 2). The fact that NSERC is looked on favourably (by academics as well as non-academics) is reassuring for current government funding policies. It reflects a realisation that there is a role for basic research (see the summary of strategies in section 3.3) and that only NSERC currently has that mandate. It was suggested that "NSERC should declare [AI] as one of the areas eligible for strategic grants", presumably explicitly rather than implicitly as part of computers and communications as is the case now.

Private industry was the second most favoured source of funds, again with remarkable agreement between academics and non-academics. One respondent thought that private industry should be made more aware of the practical aspects of AI. Federal agencies other than NSERC came in a close third; among the agencies mentioned were the Secretary of State's office, the Medical Research Council, the Department of Communications, and the Department of National Defence. One respondent expressed the sentiment that these other government departments "should fund applied research leaving basic research to NSERC". Provincial governments ranked fourth: the provincial science councils were mentioned, as were the universities. Research institutions as sources of funds for AI did not rank highly, an opinion that may be changing as organisations such as the Canadian Institute for Advanced Research (which is currently funding a project with a strong flavour of AI) prove that private capital does exist for research projects in the field.

Perhaps the most interesting suggestions made about the source of funds came among the 7 percent "others". One person suggested that "the Japanese have called for collaboration on the Fifth generation project - Canada should investigate the offer of collaboration [rather than directly competing against them]". Another well thought

2. Financial Support
Additional Funds: Provided by

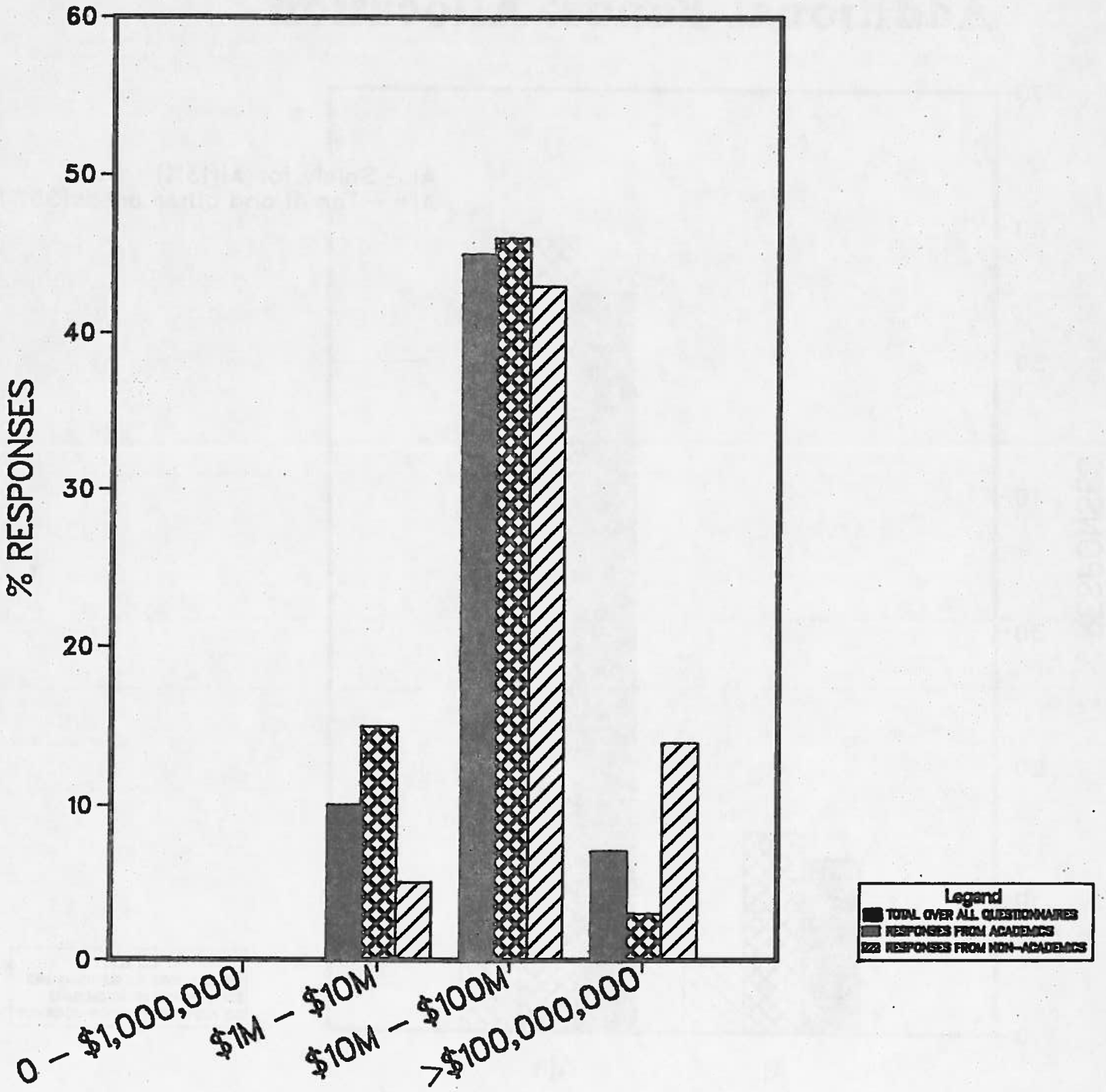


out response said that "a granting agency is needed to fund AI software developments requiring $200,000 or more (for manpower only). Such developments should be targeted to areas of potential interest to industry, perhaps 6 or more such grants per year. The effect and aim would be to get industry interested while providing them with experienced people who could further develop the products. This in turn would increase the demand for graduates."

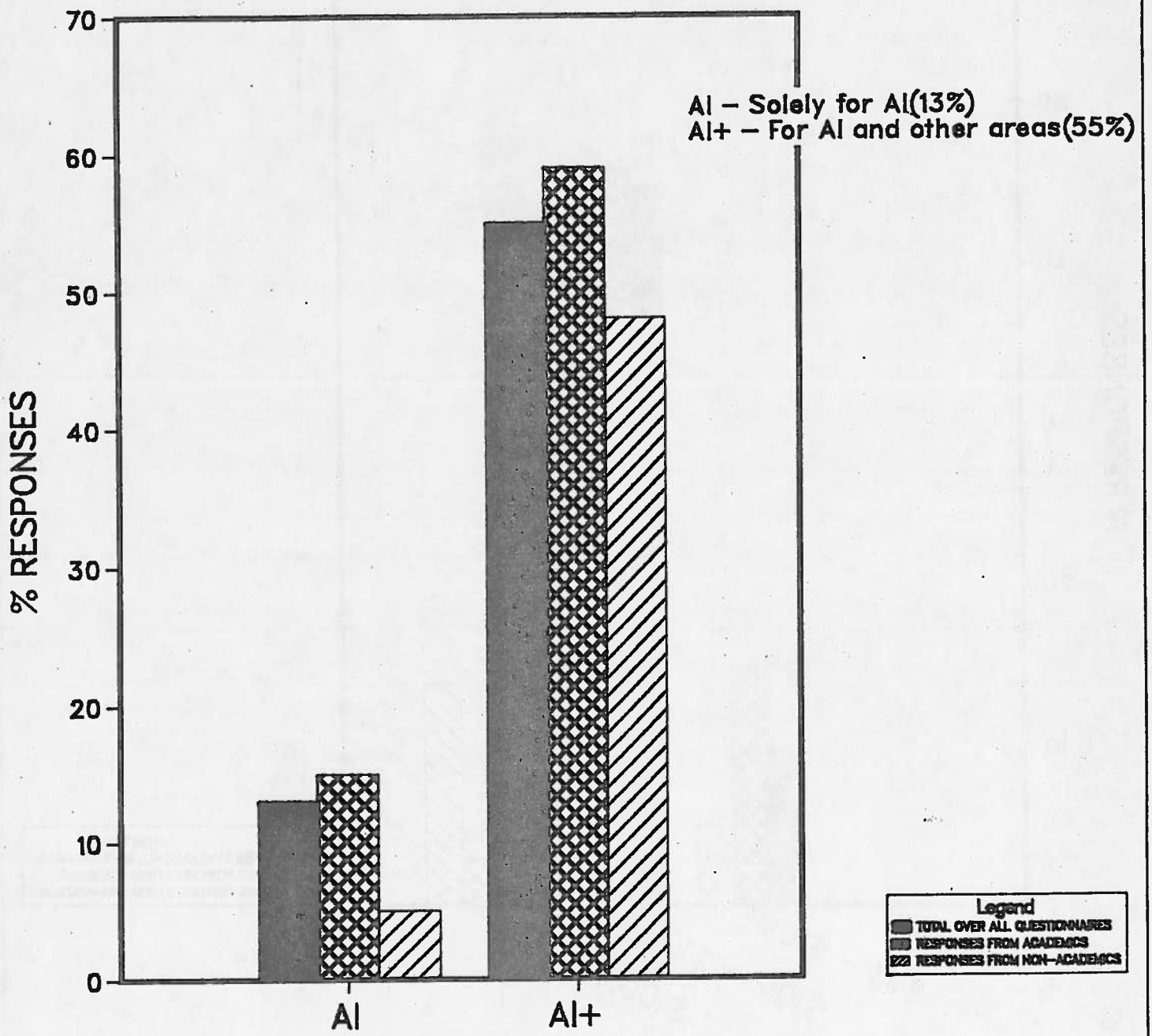
The second question in part 2 (how much money should be spent?) was sporadically answered (see graph 3). Most respondents felt that 10 to 100 million dollars in additional funding over the next 10 years (1 to 10 million per year) was appropriate, although one person said that "$10 million / year is peanuts". Whether even 1 million dollars per year is realistic is open to question in these days of restrained budgets, but the unanimous opinion was that this level of extra funds is the minimum required.

The third question in part 2 (should AI be funded in isolation or with other areas?) also had decisive results. There was less than a 100 percent response rate, but among the two-thirds who did respond, there was a 4 to 1 ratio in favour of funding AI in conjunction with other areas (see graph 4). Computer science was the most prominently mentioned "other" area, including VLSI design, hardware, software, CAD/CAM, evaluation of technology, simulation, distributed processing, and software engineering. Also mentioned were education and engineering as well as areas directly related to AI (or included in it) such as robotics, logic programming, pattern recognition, cognitive psychology, man-machine interfaces, psycho-linguistics, automatic programming, and computational linguistics. Comments supporting the need for funding AI in conjunction with other areas included "excursions into these 'esoteric' fields are not isolated ventures, but a continuum"; "[it is] impossible to define hard boundaries for AI"; and "the last thing AI wants to do is grow in a vacuum".

2. Financial Support Additional Funds: How much



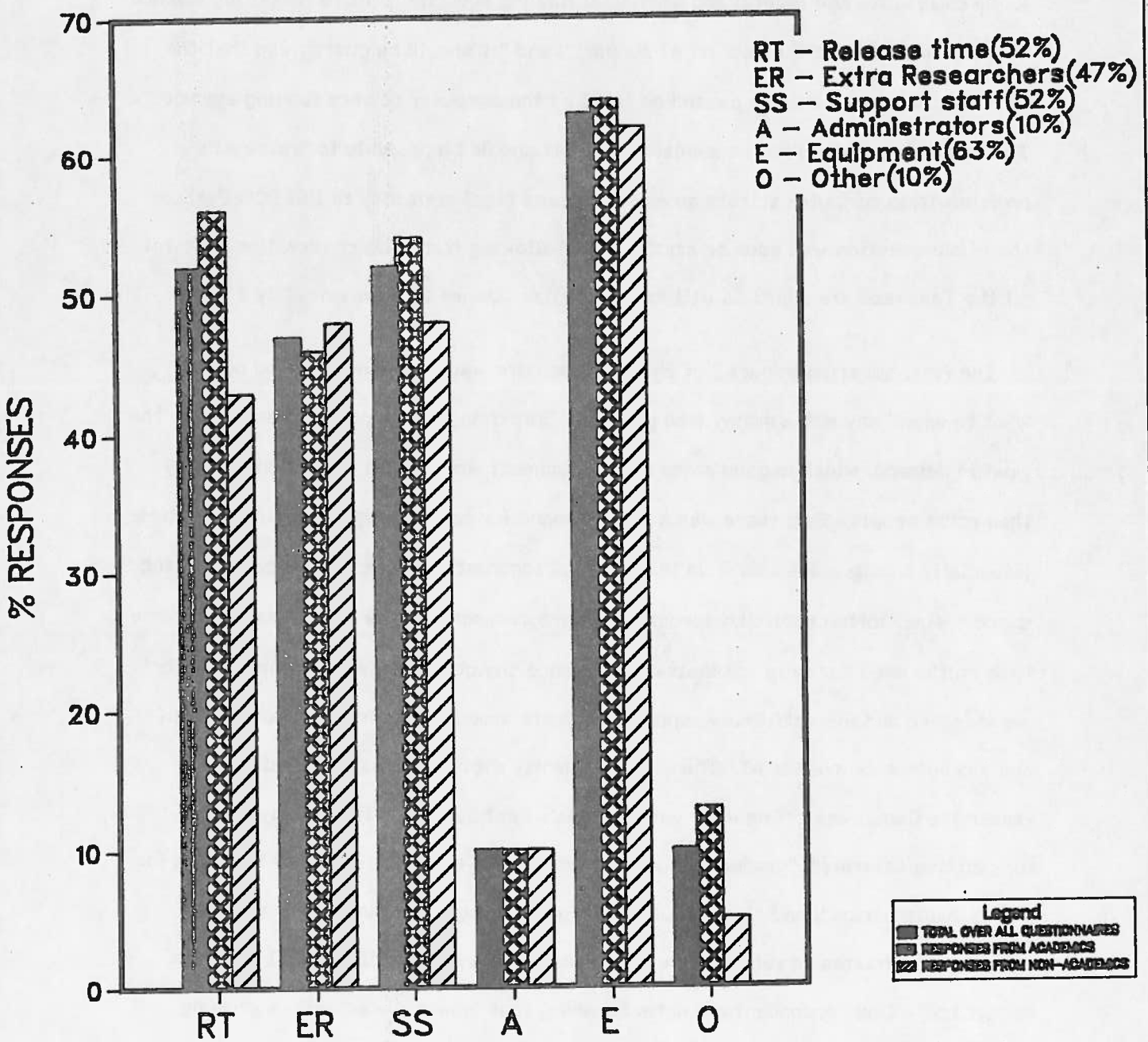
2. Financial Support
Additional Funds: Allocation



The biggest worry about supporting AI in conjunction with another area seemed to be a feeling that there had been prejudice against AI in the past (especially within computer science): "[AI must achieve] the removal of the prejudice often directed at AI by colleagues and federal and provincial funding agencies"; "more computing science support might have NO effect on AI support"; and "it should be guaranteed that the increased support would be passed on to AI by the computer science funding agencies". To avoid this problem, it was suggested that it should be possible to "raise AI's profile within computer science so as to increase [its] visibility to NSERC". Perhaps the whole question will soon be moot, as the following humorous observation attests: "if the Japanese are right, AI will be computer science (or vice versa) by 1990".

The final question in part 2 of the questionnaire was an attempt to find out on what to spend any extra money (see graph 5). Surprisingly, equipment seemed to be the most in demand, which is good since extra equipment would seem to be easier to buy than extra people. But, there was a large demand for release time from current duties (especially among academics from teaching and administration), extra researchers, and support staff (often explicitly identified as programmers). Very few respondents were keen on the need for more adminstrators. Among the other needs mentioned were for maintenance and infrastructure support, graduate student support, software, travel, and a research centre for AI. The most eloquently expressed "other" need was to repatriate Canadians: "[we must win] Canada's best back from the U.S. by paying competitive salaries"; "graduate students sent abroad should be required to return for a reasonable period"; and "[we should] keep good young Canadians in Canada and convince expatriates to return (more money, better working conditions, AI research labs., etc.)". One respondent did note, however, that "there are actually a growing number of AI researchers in Canada despite the 'brain drain' - it is now 'de rigeur' to have one AIer even in a small department".

2. Financial Support
Additional Funds: Targeted towards



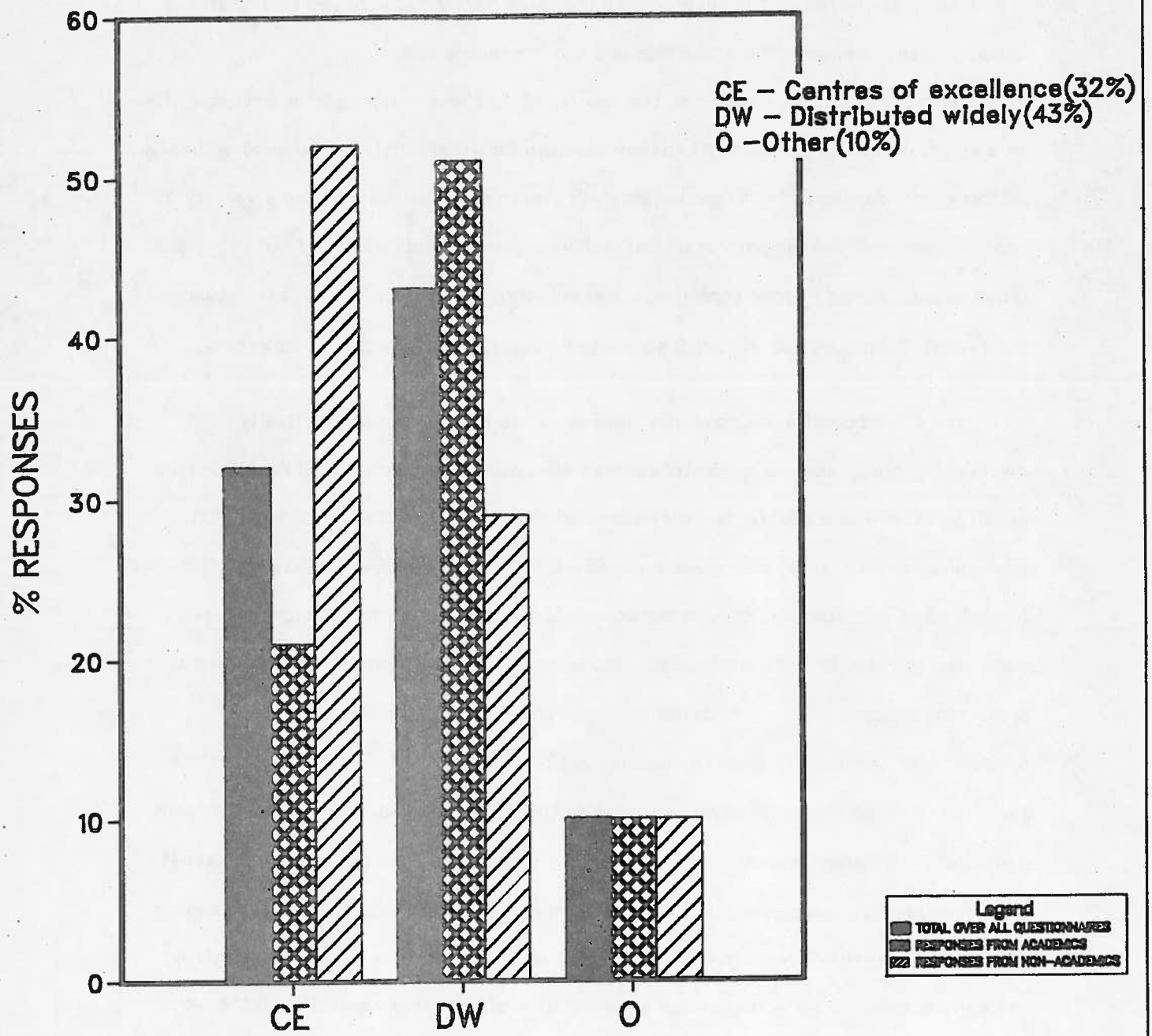
3.3 Part 3 - Strategies

In part 3 of the questionnaire respondents were asked to comment on a number of different possible strategies for AI in the next decade. This part was more universally answered by the respondents than was part 2. It also led to a couple of disagreements between the academics and the non-academics.

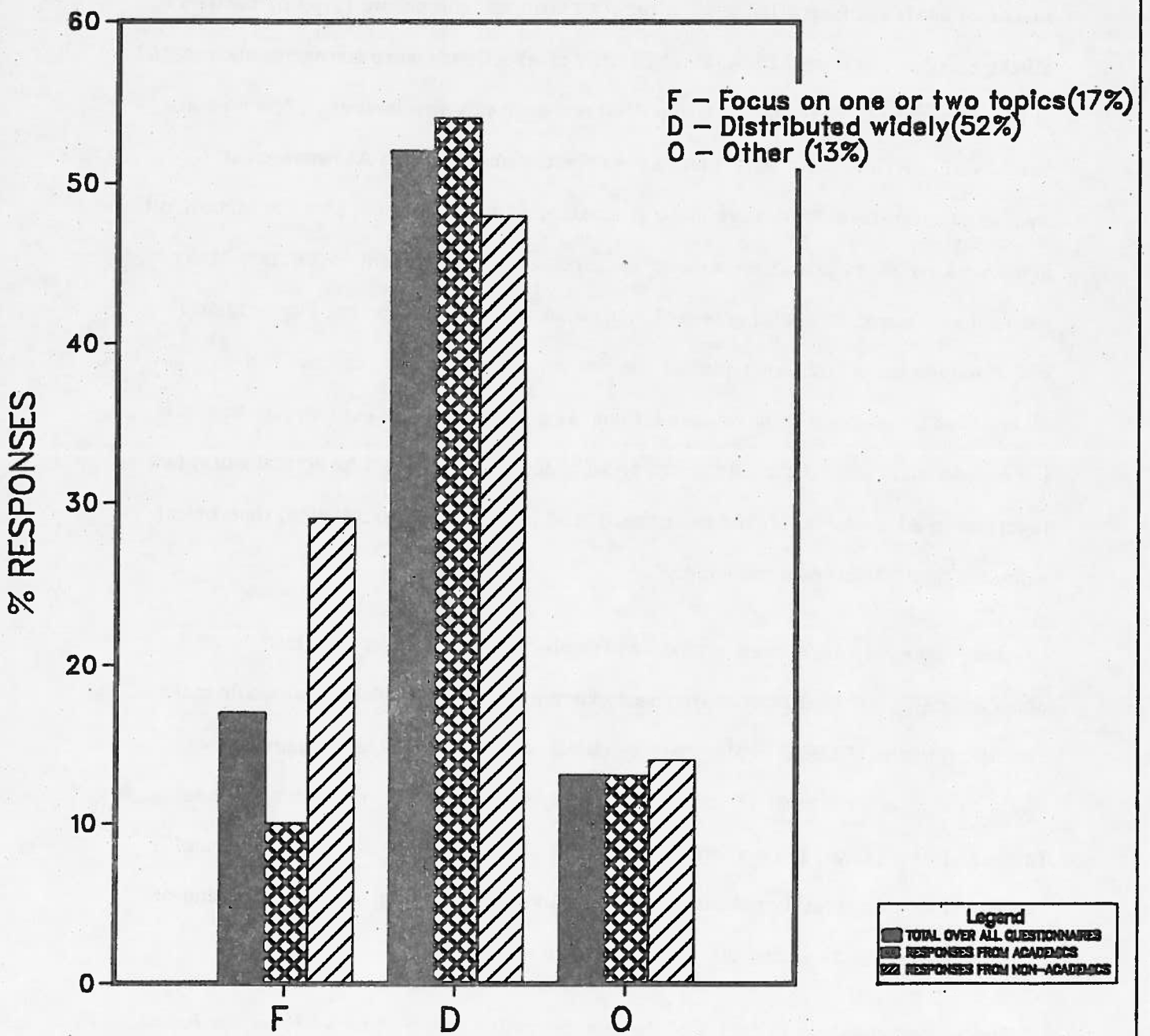
Graphs 6 through 11 summarise the responses to these "strategic" questions. Here is a synopsis of the findings: AI research should be widely distributed geographically (although academics and non-academics differ on this), focussed on a wide variety of topics, directed towards both practical and theoretical results, carried out in universities, aimed at long term goals, and oriented towards software rather than hardware. Each question in part 3 generated an interesting variety of opinions.

In the first question respondents were asked to contrast two essentially different geographic arrangements: centres of exellence vs widespread research (see graph 6). There is a substantial difference of opinion between academics and non-academics on this issue: non-academics were 2 to 1 in favour of concentrating research in centres of excellence (although sometimes the number of centres suggested was somewhat greater than 2), while academics were over 2 to 1 against such concentration, preferring instead a widely distributed research effort. The reasons for this difference of opinion are open to speculation: it could merely be an artifact of the particular subset of people who responded to the questionnaire, or it could represent a distinctly different approach favoured by the two camps. The fact that the majority of both academics and non-academics preferred the research focus to be wide ranging (see graph 7) further clouds the issue, since it would seem to be easier (although by no means essential) for a researcher to maintain a different perspective on the world if he or she isn't physically close to a critical mass of people with a particular world view.

3. Strategies: Geography



3. Strategies: Investigations



This question of centralized vs widespread activity generated many comments. In favour of centres of excellence were remarks such as "one or two large AI centres is all the country can support". Against centres of excellence were comments such as "AI is too diverse and ill-formed yet to put all our eggs in a few baskets"; "centres are notoriously difficult to create"; and a plea for the ability to do AI research at smaller universities: "there are more graduate students, perhaps, at a big school, but often less freedom, less open-mindedness, less control, more anti-AI bias". Many respondents suggested letting research grow wherever it found root ("anarchism") or saw the need for a "judicious mix" of the two strategies: "both [centres and distributed] - we have to have at least one AI person in each ... university to teach the people who come to the centres to be AI graduate students"; "practical work, i.e. functioning AI systems, should be concentrated in centres of excellence; theoretical work can be distributed more widely".

One frequently expressed desire was for electronic networks to allow geographically distributed researchers to keep in touch: "one thing that would make a big difference is if CSCSI could organise us all on a net". Another suggestion was funds to increase the mobility of people so they could "interact on a personal basis, [make] visits, [take] leaves, etc." This might allow a sort of distributed critical mass, and would certainly enhance communication, idea sharing, and the launching of co-operative projects among different institutions.

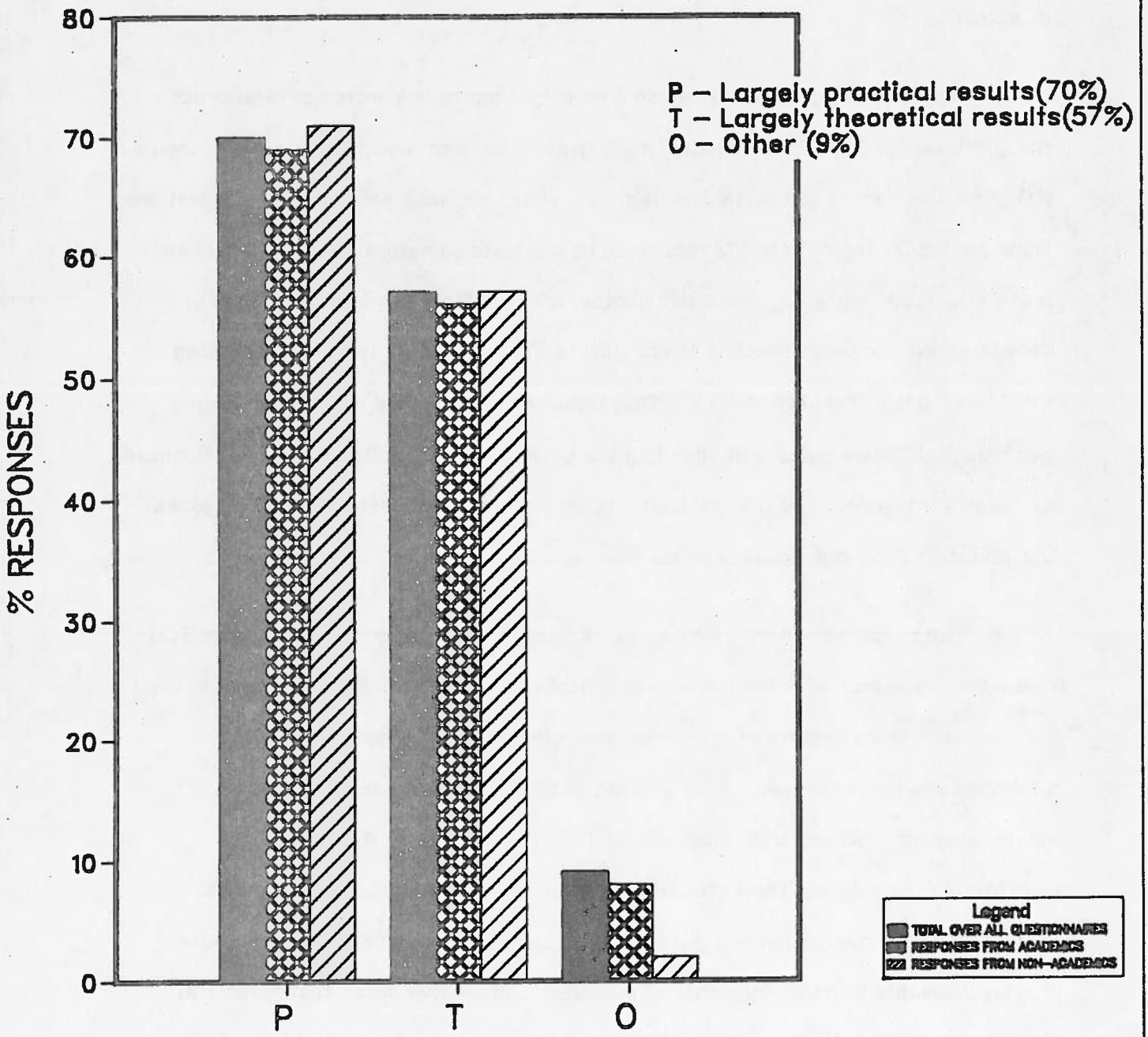
The second question in part 3 of the questionnaire asked about whether the focus of AI research should be on one or two topics or distributed more widely. There was considerable opinion (see graph 7) that research topics should be diverse since to ensure self-sufficiency Canada "must provide expertise in all areas of AI" and that the difficulty of predicting successful avenues of research in advance requires "broad

based support". There was a strong feeling that it was impossible at any rate to easily direct what people chose to investigate, i.e. that the focus should be "research driven" and that we "don't want a lot of regulations and government direction".

Those who did suggest focussing on a couple of topics (and more non-academics thought this way than did academics) made general comments such as "priority [should be] given to existing strengths and national needs", or made more specific suggestions about particular topics: e.g. "Canada could concentrate on natural language (machine translation), [interpreting] satellite photos, and 2 or 3 other relevant topics"; or Canada should focus on "specific needs such as French/English translators, mining robots, and grain train schedulers". This topic can be concluded with the following two remarks: "those capable of spending the poor taxpayers' dollar are more influenced by Japan's 5th generation than by anything we can do"; and "on the whole [AI] looks like an interesting mosaic after an earthquake".

The third question in part 3 was aimed at sampling opinion on whether theoretical research or research oriented towards practical results was more important. As graph 8 shows, the strong feeling of academics and non-academics alike was that both directions should be pursued. Most seemed to feel that theory and practice are inextricably intertwined, with practical systems providing essential data for theoretical research, and theoretical results being extremely helpful to practical applications. As one respondent put it: "[you] can't separate them yet - [moreover, it is] undesirable to do so for political reasons"; and another noted that "practical applications offer a door opener and the possibility of support for more long term work". It was also suggested that many people still don't realise that AI is practical - "[we] need to get across to Canadian government/industry the idea that AI

3. Strategies: Directions

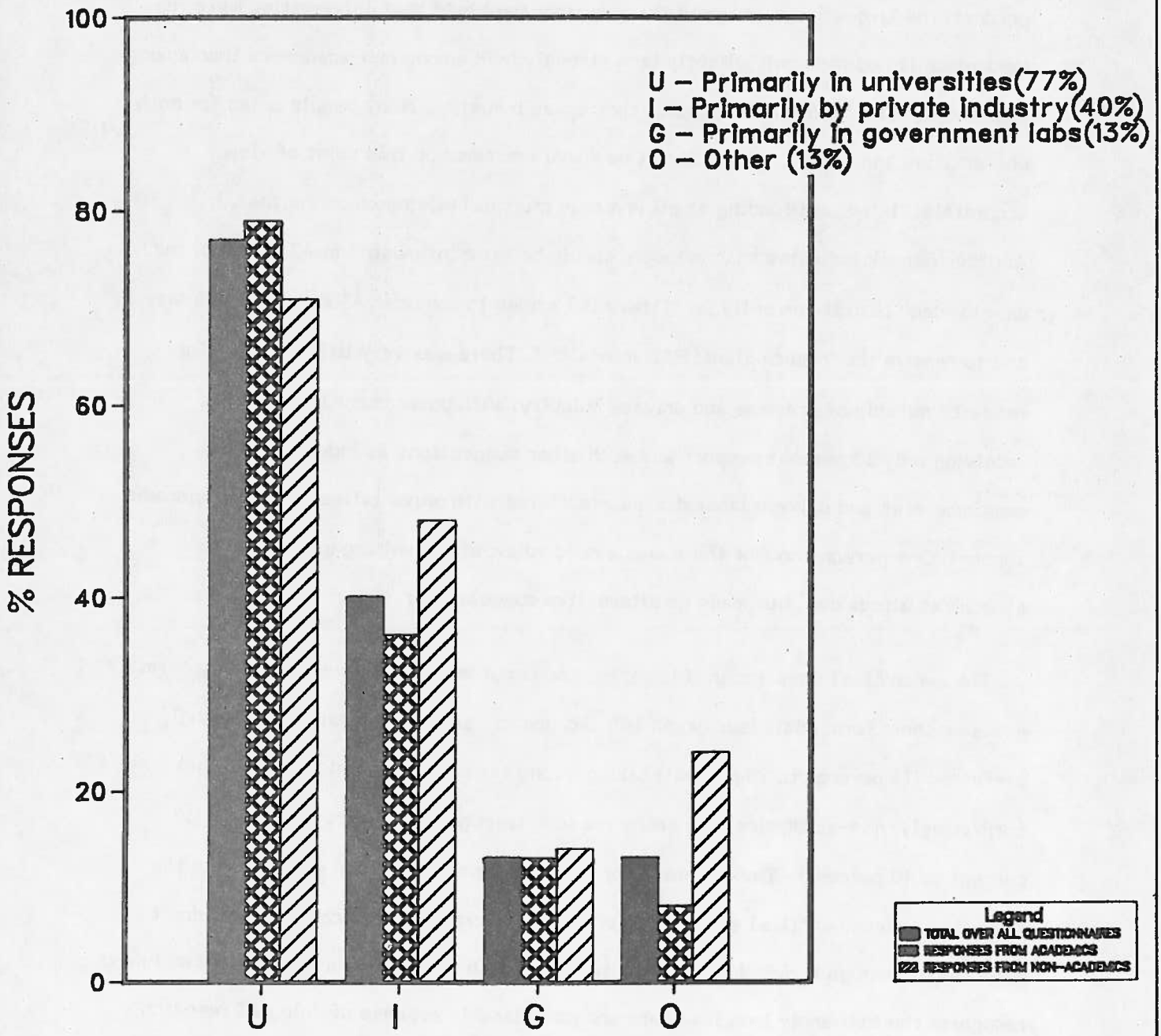


may actually be of use".

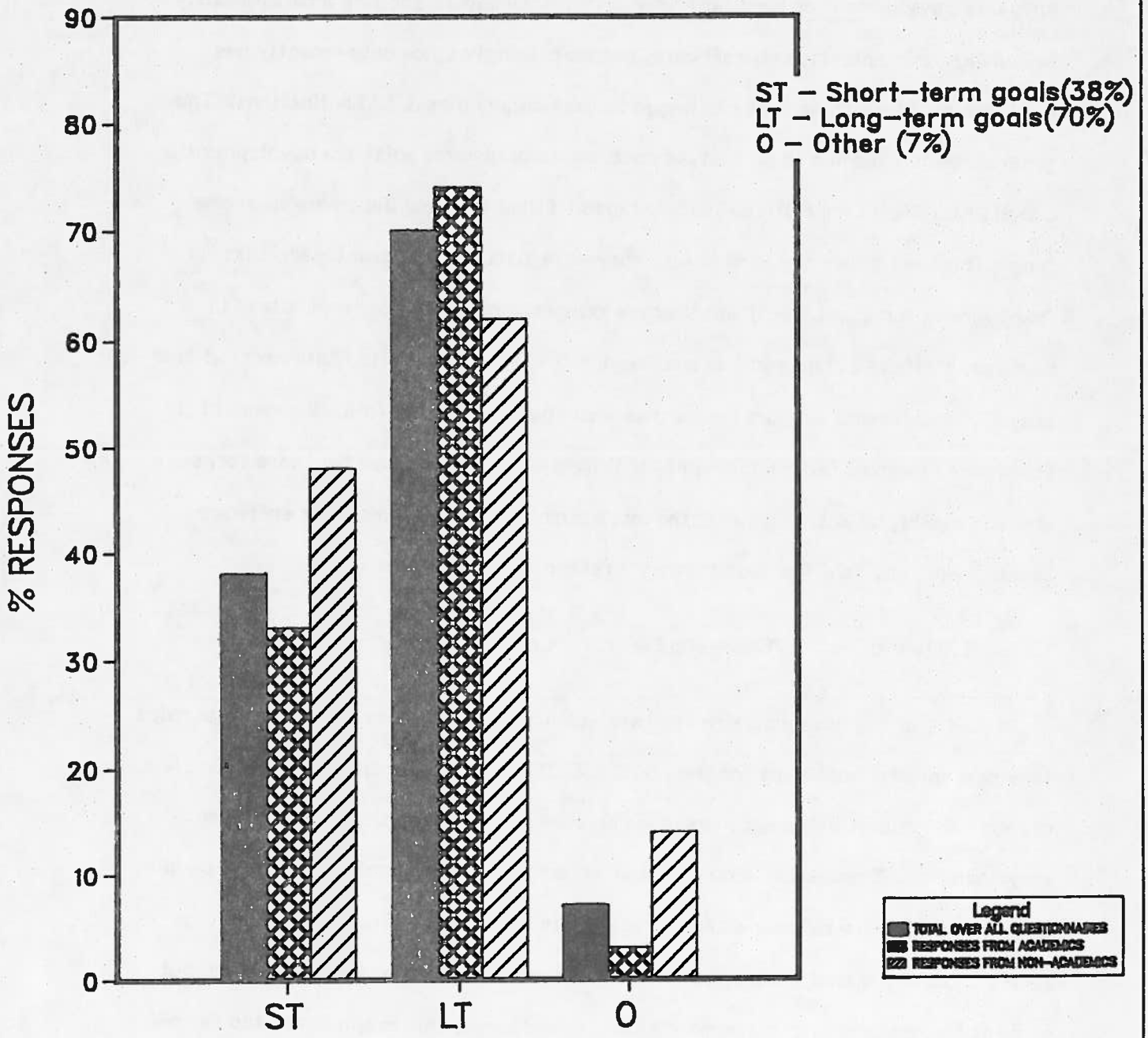
In the fourth question respondents were asked where they felt AI research and development could best be carried out (see graph 9). Substantial opinion (at 77 percent, the largest percentage in the questionnaire) held that universities were the best place (an opinion only slightly less strongly held among non-academics than among academics). The second most popular choice was industry. Many people opted for both universities and the private sector. One remark summed up this point of view accurately: "increased funding at all levels is crucial, building on strengths". Another remark indicates that industry should be more interested in AI research and development than it currently is: "[there is] a need to consider AI issues by industry and to remove the 'branch plant' R&D mentality". There was very little backing for research outside of academe and private industry, with government laboratories receiving only 13 percent support and such other suggestions as industrial conglomerates and private laboratories associated with universities receiving sporadic support. One person thought there was a need to avoid current organisational structures altogether, but made no alternative suggestions.

The second last question in this part asked about whether AI should set long term goals or short term goals (see graph 10). Academics (as might be expected) strongly preferred (74 percent to 33 percent) taking a long term perspective; but, somewhat surprisingly, non-academics also preferred long term goals to short term goals (62 percent to 48 percent). The argument for the long term view can be summed up in the following comments: "[we] shouldn't oversell the short term applicability - we don't have nearly enough knowledge to guarantee success in many, many areas"; and "[we] must recognize the extremely long lead time and considerable expense of doing AI research". However, it should always be realised that "AI is clearly a cutting-edge discipline with massive potential payoffs".

3. Strategies: R & D Locale



3. Strategies: Goals



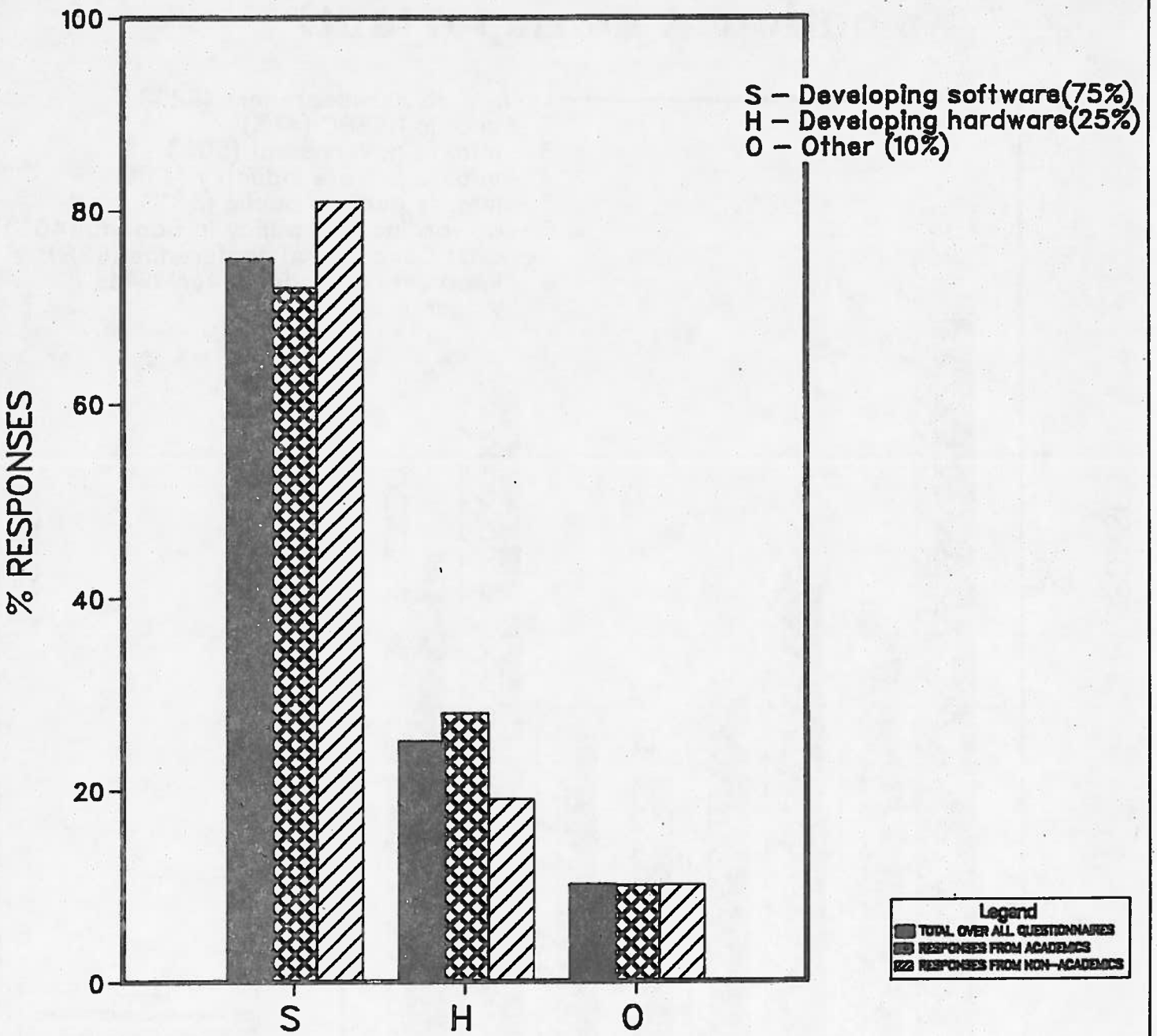
Finally, respondents were queried about whether AI should be oriented around software development or hardware development. Graph 11 shows a 3 to 1 plurality favouring a concentration on software, not surprisingly since only recently has hardware become a topic that has begun to take on any direct AI implications. The general feeling seemed to be that, in contrast to hardware, software development in Canada faces few competitive disadvantages ("[the] U.S. and Japan are awesome competitors in hardware - in software they have little or no advantage"); that "hardware is too expensive"; and that our competitors have too strong a lead in hardware ("[there is] no point in challenging the U.S. or Japan in [hardware] at this stage"). Backhanded support for hardware can be found in the following remark: "if [hardware] means LISP machines, no; if it means special purpose hardware for, say, vision, possibly". But, in general the most promising path seems to be software development (and as a few said "theory") rather than hardware.

3.4 Part 4 - The Role of the CSCSI/SCEIO

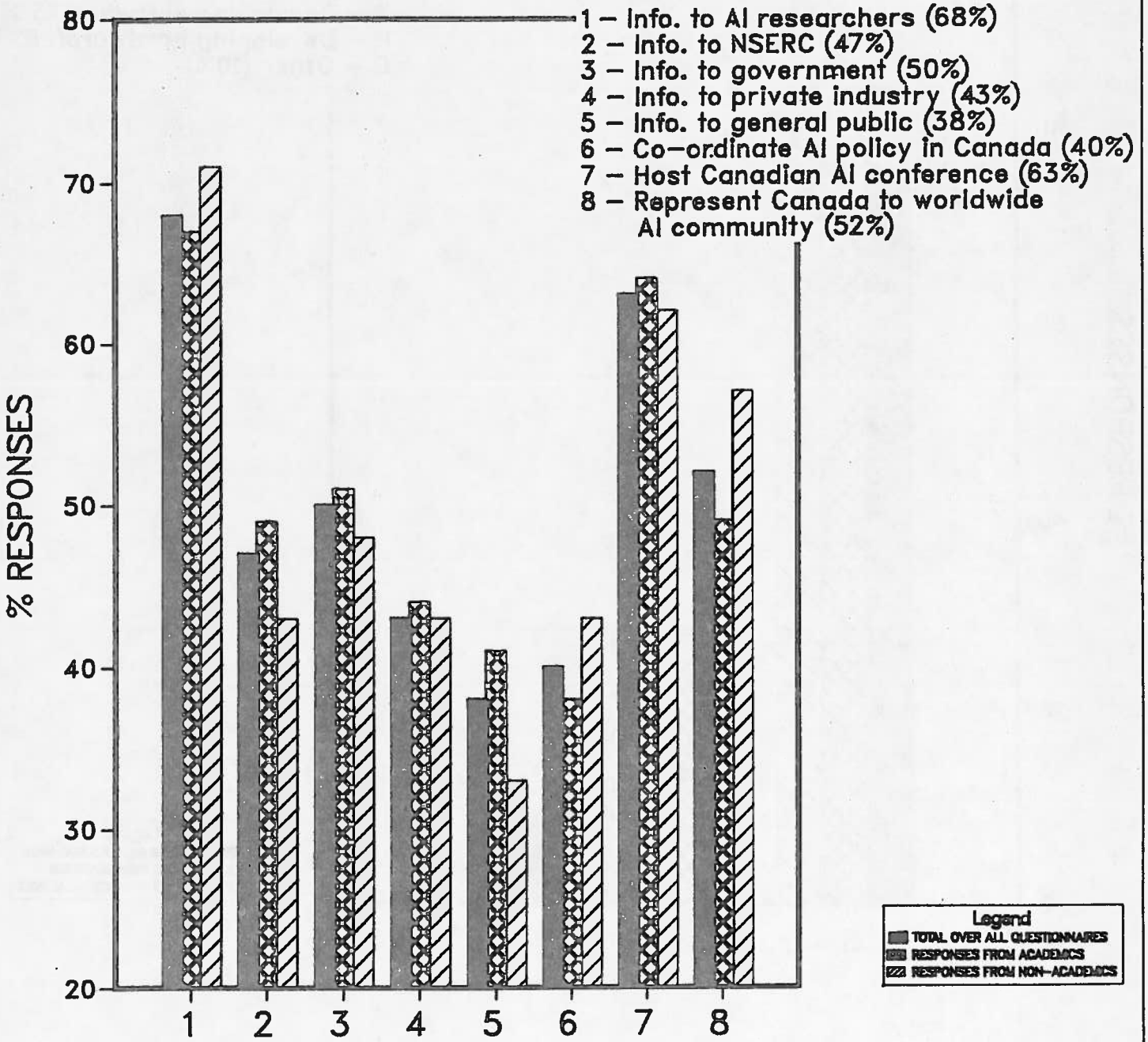
In part 4 of the questionnaire the respondents were asked to comment on the roles they saw as most important for the CSCSI/SCEIO, in order of priority. Some people did not indicate priorities; in such cases we decided to rank the choices in the order they appeared. This assumption does not affect graph 12, indicating the roles people mentioned anywhere in their choices, regardless of priority. Graph 13, indicating people's top three choices, may be a little less accurate due to this assumption, but since many people did not mark more than a few choices, this graph is not too far off.

According to graph 12, respondents support all 8 roles mentioned for CSCSI/SCEIO, with marginally more people in favour of its roles as "provider of information to the AI community" and "host of a Canadian AI conference" over its other roles. The other roles did not differ too much, with the least favourite roles, in order of disfavour,

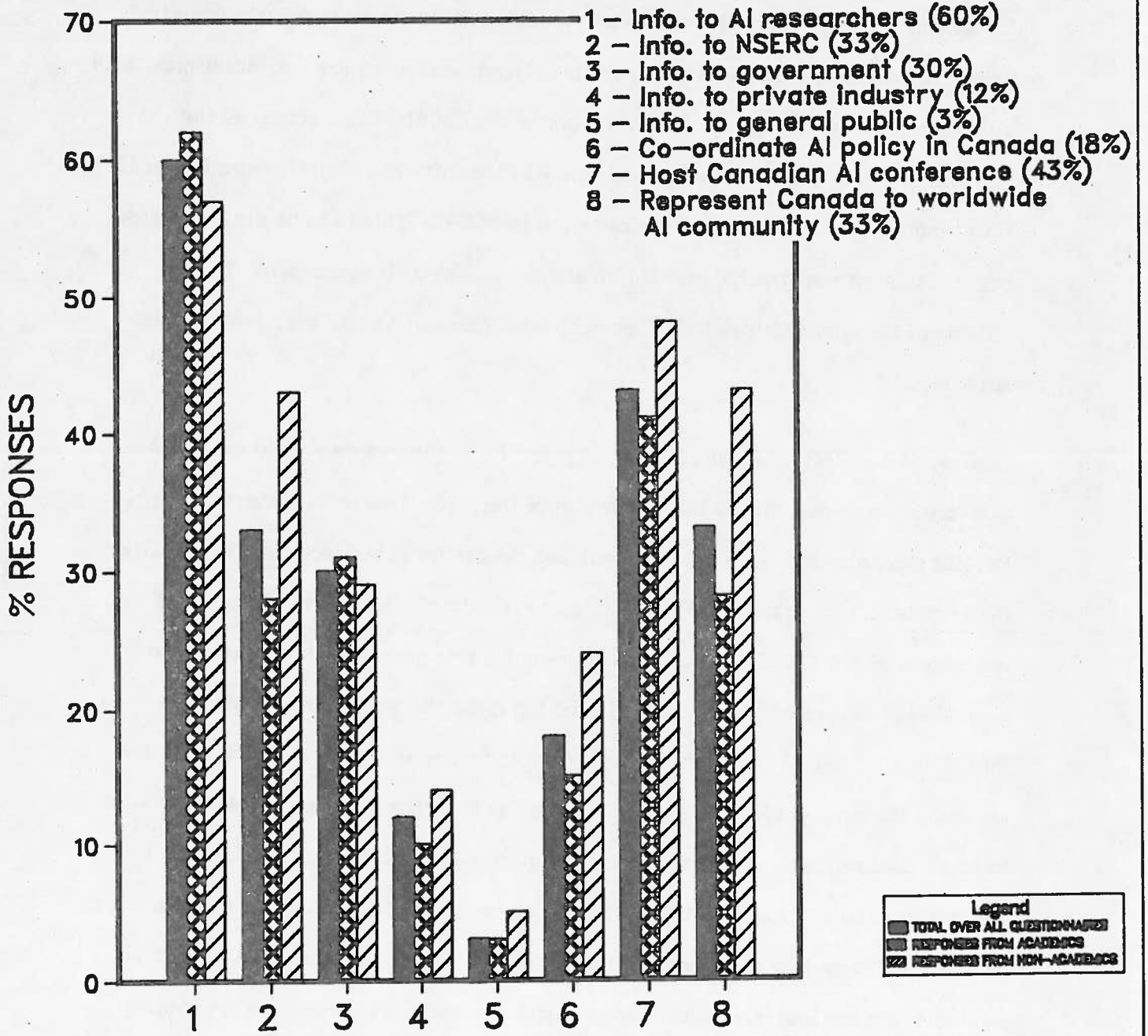
3. Strategies: Orientation



4. Role of the CSCSI/SCEIO (mentioned as important)



4. Role of the CSCSI/SCEIO (mentioned among top 3 priorities)



being "provider of information to the general public" (dead last), "co-ordinator of Canadian AI policy" (second last), and "provider of information to private industry" (third last). These preferences vary little between academics and non-academics, with slightly more non-academics being in favour of the CSCSI/SCEIO acting as the representative of Canada to the worldwide AI community and slightly more academics favouring its role as provider of information to NSERC. This is to be expected when it is considered that the non-academic category included all respondents living outside of Canada, and that NSERC is much more relevant to academics than to non-academics.

Graph 13 reflects the same trends as graph 12, but in a more pronounced manner. Due to our somewhat biased interpretation of the priorities, roles occurring later in the list should probably be boosted a bit and the earlier roles decreased marginally. Nevertheless, this graph is informative since it indicates strongly held opinions as to the role of the CSCSI/SCEIO. Unlike graph 12, this graph divides sharply into 3 equivalence classes of preferences. In the top class there is "provider of information to the AI research community", standing by itself (at 60 percent) as far and away the most preferred role. In the next equivalence class are 4 roles in the 30 to 45 percent range, in descending order "host of a Canadian AI conference", "representative of Canada to the worldwide AI community", "provider of information to NSERC", and "provider of information to other government agencies". In the bottom equivalence class are roles which range from 3 percent to 18 percent, in descending order "co-ordinator of Canadian AI policy", "provider of information to private industry", and "provider of information to the general public".

Respondents were asked to make suggestions about future roles for the CSCSI/SCEIO and many of them did. There were those quite satisfied with the CSCSI/SCEIO: "it is the only hope [for Canadian AI]"; and others were quite down on the organisation: "the

CSCSI is 'mickey mouse', unprofessional ... I am not impressed with the performance of the CSCSI so far. AI in Canada is not synonymous with the CSCSI." But the general feeling was constructive: that we have done all right so far and can work together to effect the various changes needed. The suggested areas for change were numerous. They can be categorised into 5 basic groupings: changes in the image of the CSCSI/SCEIO, changes in the publications, changes in the conference, suggestions for other roles, and changes in organisational structure. Each of these categories will be dealt with in turn, quoting liberally from the questionnaires.

The most numerous group of suggested changes pertained to improving the CSCSI/SCEIO's image in various ways. As one person suggested: "[we] must reach all of the AI community and win its confidence that CSCSI is a useful body". There were several ways of doing these put forward by the respondents:

(i) improve public relations -

> "[we need] more aggressive public relations work, i.e. when someone thinks 'AI' they should also think 'CSCSI'"; "generate lots of 'PR' to let the world know we exist"; "more press releases"; "[CSCSI/SCEIO] is not as widely subscribed to as it should be - an extensively advertised membership recruiting campaign is in order";

(ii) influence government -

> "[CSCSI/SCEIO should be] more active as spokesman to government" with the following ways having been mentioned: "try to get members into important positions in government and NSERC"; "[appoint within CSCSI/SCEIO] an official person or group to liase with and advise government"; "lobby in Ottawa";

(iii) change the style of CSCSI/SCEIO -

> "stop schoolboy responses - questionnaires"; "militancy"; "assertiveness"; "AISB [the British/European AI society] is successful - what has it got that CSCSI hasn't?"

(iv) be more nationalistic -

"don't look so much to the U.S. AI community"; "decide whether [the] focus is primarily Canadian or international"; "should use Canadians more in the CSCSI";

(v) foster better communication -

"[it] should be possible to get across to people on the fringe of AI what is actually going on"; "[CSCSI/SCEIO should] provide more information to AI people and related disciplines and find money/researchers in this area"; [CSCSI/SCEIO should] develop the 'administrative resources' to respond quickly to requests for information on AI in general and AI in Canada in particular"; as well as the comments noted earlier about the need for electronic communications links among the Canadian AI community.

The second group of responses generally relate to enhancements in the publications produced by the CSCSI/SCEIO:

(i) improve the newsletter -

"[the] newsletter [should] be more frequent and regular"; "good explanations of research projects which don't read like grant applications or bits of Ph.D. theses might help outsiders get interested - it's that or Newsweek"; "[there should be] regular periodicals, reports, articles - aim at educated public and industry"; "[we need a] better newsletter - have a specific 'group' within CSCSI with more direct responsibility for producing the newsletter"; "raise the dues (if necessary) to support PR, a journal, and a monthly newsletter (a la SIGPLAN)";

(ii) start a journal -

"[we] need an AI journal in Canada"; "[we need a] quick publication journal stressing tutorials and interdisciplinary research contributions serving to improve communications within the AI community, to involve scientists in other disciplines, and to establish visibility with the lay public";

(iii) prepare a document on AI in Canada -

"[CSCSI/SCEIO should] put together a summary of AI (in a special CIPS mailing)"; "[CSCSI/SCEIO should] prepare a document based on members' opinions outlining the directions AI is taking and/or should take"; "some time consuming but useful activities might include our own view of where we see the field going ... [but] this is largely a matter of the time and energy people have to devote to the cause. I'd still rather see people do real scientific work."

(iv) make use of electronic media -

several suggestions were made about having an electronic journal or electronic newsletter or electronic conference - see section 3.3.

The third group of responses pertain to the CSCSI/SCEIO conference and improvements to it that would be possible: "a first rate conference seems a good way to guarantee credibility within the AI community (and I think this has been the case in the past)"; "[CSCSI/SCEIO should] make conferences higher profile"; "[CSCSI/SCEIO should] sponsor 'special topics' conferences (i.e. 'working' conferences) in off-years from CSCSI conferences, e.g. applications of AI to VLSI design, man-machine interfaces, etc." There was some concern that the CSCSI/SCEIO was being ignored in some AI conferences and workshops and should have a more prominent role in such affairs: "[we should] insist on [CSCSI/SCEIO] participation at all future conferences, workshops, etc., having to do with AI".

A fourth group of responses suggested other possible roles for the CSCSI/SCEIO. One of these was for it to act as a clearinghouse: "CSCSI should be a very competent, aggressive link between academia and industry, actively trying to set up pilot AI projects in industry or collaborative projects involving several AI centres"; "people in Toronto, Montreal, and Ottawa [could] promote CSCSI and act as contacts for anyone in their [research] area who needs AI information/referral/etc." There were many reactions to CSCSI/SCEIO acting as co-ordinator for Canadian AI, ranging from "no" to "that'll be the day". Another possible role for CSCSI/SCEIO would be to enhance its international outlook by representing Canadian AI abroad, perhaps, as one person suggested, by trying to gain "the right to send or elect a Canadian representative to the AAAI executive board", or conceivably by representing Canada on the IJCAI (International Joint Conference on AI) board if it re-organises along IFIPS lines. CSCSI/SCEIO was even mentioned as a possible source of funds to support AI research.

There was a fifth set of reactions that questioned CSCSI/SCEIO's current organisational structure in relation to achieving its goals: "[CSCSI/SCEIO] should review its relationship to CIPS"; "[we should] push for a true Canadian computer science organisation - I have nothing good to say about CIPS". Some people even questioned whether the CSCSI/SCEIO could (or even should) achieve its goals: "CSCSI hasn't enough manpower to fulfill all its goals"; "are there enough AI people to justify a separate Canadian organisation such as CSCSI?"; "the CSCSI is not perceived as a 'live' entity - apart from the conferences it doesn't 'do' anything - I'm not sure it really can. It's not anyone's fault." But, the majority seemed to be less pessimistic: "I think [the changes] have been happening - e.g. refereeing for CSCSI-84, generally better organization with continued effort and growth."

In concluding this section, it should be mentioned that some of the changes mentioned above are already underway. In October, 1983 Nick Cercone and Gord McCalla launched a proposal for a new international high quality AI journal, Computational Studies of Intelligence, to be sponsored by the CSCSI/SCEIO. A survey of selected AI researchers in Canada and worldwide has revealed considerable support for such a journal and negotiations are underway for a publisher, with a projected start-up date in 1985. The CSCSI/SCEIO was consulted on the invitation list for the Science Council/Canadian Institute for Advanced Research conference to be held in March 1984 in Ottawa (although had no input into the programme). An electronic communications net, the USENET, now connects many Unix systems across the country; there are two news groups of particular interest to Canadians: CAN.AI, with notes of general interest to AI researchers in Canada, and CAN.AI.CSCSI, with emphasis on items of interest specifically to the CSCSI/SCEIO. And, finally, this document will hopefully satisfy the desires of those who want a survey of AI in Canada. Despite these promising iniatives, much remains to be done.

4. Concluding Remarks

The Canadian Society for Computational Studies of Intelligence / Societe Canadienne pour Etudes d'Intelligence par Ordinateur began inauspiciously in 1973 with an informal "get together" at the University of Western Ontario. This was followed by the Ottawa "workshop" in 1975. The First National Conference of the CSCSI/SCEIO was held in 1976 at the University of British Columbia. Every two years since 1976 a national conference has been held and refereed Proceedings produced. In 1978 the second conference was held in Toronto, followed in 1980 by the third conference at the University of Victoria and the fourth conference in 1982 at the University of Saskatchewan. Our Fifth National Conference is being held at the University of Western Ontario in May, 1984 with Ted Elcock acting as general chairman, Mike Bauer handling local arrangements and John Tsotsos is the program chairman.

The CSCSI/SCEIO became a special interest group of CIPS in the late 1970's. Formal accreditation came to the CSCSI/SCEIO in 1980 in the form of a constitution and the Ontario letters patent were filed that year. Our purpose, according to the constitution, is to promote the interests of professionals by setting up study groups to investigate and report on relevant major issues, to organise seminar and tutorial meetings, publish the CSCSI/SCEIO newsletter for the membership, forge and maintain informed links with Government, Industry and other societies with similar goals, and other items of interest to the society. The CSCSI/SCEIO is organised and operated exclusively for the educational and research purposes in the interest area of computational studies of intelligence.

The CSCSI/SCEIO can report considerable success with regard to our raison d'etre. The newsletter, which came out annually in the early years, one being produced at UBC,

Western Ontario, Toronto, Alberta, and Ottawa, is now more frequently distributed. In the future we will be trying to publish quarterly. The CSCSI/SCEIO co-operated with two organisations, CIPPRS and CMCCS, producing a jointly written newsletter, thanks mainly to the efforts of Wayne Davis and University of Alberta facilities. Alan Mackworth announced last year that NET.CAN.AI and NET.CAN.AI.CSCSI were created for users of the UNIX UUCP mail facility as another vechicle for dissemination of information about Canadian AI activities. Present and past executive of the CSCSI/SCEIO have written timely and concerned letters to industry, private foundations, and government officials (particularly NSERC and Science Council) putting forth concerns of the CSCSI/SCEIO.

The CSCSI/SCEIO is the oldest national organisation in the world whose major purpose is the promotion of artificial intelligence (interpreted in a broad sense). It has co-sponsored the 7th IJCAI which was held in Vancouver in 1981. In addition the October, 1983 issue of IEEE Computer was solicited by the IEEE and based, in part, on the papers presented at our 4th National Conference in Saskatoon. The CSCSI/SCEIO has been negotiating with NRC over the past few months to begin publishing a new journal - Computational Studies of Intelligence. A recent survey of artificial intelligence researchers worldwide was conducted by the CSCSI/SCEIO (thanks to funds provided by Simon Fraser University) which showed overwhelming support for such a journal. The Executive is confident that the CSCSI/SCEIO can sponsor and maintain a high-quality journal like CSI

This document represents another CSCSI/SCEIO effort to better inform its membership, government, industry and the general public about artificial intelligence and, in particular, AI in Canada. We welcome feedback from the readers of this report, both to augment and make corrections to future updates of "Directions for Canadian

AI". Our final hope is that this report will generate additional interest in and discussion about the CSCSI/SCEIO. The organisation already fulfills a number of valuable roles: disseminating information on Canadian AI through its newsletter, putting on a respected biennial conference, and providing an organisation through which Canadian AI can be represented to government, industry, and other AI societies. With concerted effort, these current roles can be maintained and strengthened, and other roles can be contemplated. It is up to us.

Appendix 1 - The Questionnaire (Short Form)

1. Background Information

Name of Institution _____

Personnel

Name	Research Interests	Status

Summary of Major Research Projects

2. Financial Support

Are current levels of support for AI adequate? Y/N

If you answered no,

should additional funds be provided by

the federal government (through NSERC) ____
the federal government (through other agencies) ____
the provincial governments ____
private industry ____
research institutions (e.g. CIAR) ____
other (please specify) ____

how much additional support is necessary to fund Canadian AI over the next ten years?

0 - $1,000,000 ____
$1,000,000 - $10,000,000 ____
$10,000,000 - $100,000,000 ____
greater than $100,000,000 ____

should additional funding be provided

solely for AI ____
for AI and other areas also (please specify) ____

additional funds are needed most urgently for

release time for current AI workers ____
extra researchers ____
support staff ____
administrators ____
equipment ____
other (please specify) ____

3. Strategies

Do you believe current strategies for Canadian AI research and development are adequate? Y/N

If you answered no,

should AI research be <u>geographically</u>

concentrated in one or two "centres of excellence" ____
distributed widely across many places ____
other (please specify) ____

should AI research <u>investigations</u> be

focussed largely on one or two main topics ____
distributed across a diversified range of topics ____
other (please specify) ____

should AI research be <u>directed</u> towards

largely practical results ____
largely theoretical results ____
other (please specify) ____

should AI research and development be carried out

primarily in universities ____
primarily by private industry ____
primarily in government labs. ____
other (please specify) ____

should AI research be focussed on

short-term goals ____
long-term goals ____
other (please specify) ____

should AI research be <u>oriented</u> towards

developing software ____
developing hardware ____
other (please specify) ____

4. The Role of the CSCSI/SCEIO

Does CSCSI/SCEIO have a role to play in the next decade? Y/N

If you answered yes,

indicate in order of priority the roles for CSCSI/SCEIO which you think will be most important

provider of information to the AI research community ____
provider of information to NSERC ____
provider of information to other government agencies ____
provider of information to private industry ____
provider of information to the general public ____
co-ordinator of Canadian AI policy ____
host of a Canadian AI conference ____
representative of Canada to the worldwide AI community ____

what changes to CSCSI/SCEIO do you feel are necessary in order to fulfill its obligations to Canadian AI over the next decade?

<09-26-83>

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place stamp here.

CSCSI/SCEIO QUESTIONNAIRE
attn: Nick Cercone, Gord McCalla
Computing Science Department
Simon Fraser University
Burnaby, British Columbia, CANADA
V5A 1S6

Appendix 2 - Respondents to Questionnaire

This CSCSI/SCEIO report represents the collective views of those members of the organisation who responded to the initial long questionnaire in early 1983, the shorter version in Fall 1983 (either by mail or the result of our telephone poll), or views derived from other sources by the authors.

Legend

First category: Type of Response

- (L) - response to long questionnaire
- (S) - response to short questionnaire
- (P) - response to short questionnaire via telephone poll
- (D) - response derived from other sources (note: responses in this category not included in statistics)

Second category: Type of Respondent

- (A) - response from Canadian Academic
- (N) - response from non 'Canadian Academic', i.e., everybody else

The following "capsule" summaries are arranged geographically, from West to East.

Chang, Ernie (S) (A)
Department of Computer Science
University of Victoria
Victoria, British Columbia V8W 2Y2

Others: Ken Gamble

Areas: expert systems, ATNs for dialogue

Project(s): LISP based expert systems to interpret liver function tests - investigate utility function approach to selection of next test; compilation of production rules from descriptive knowledge base; ATN interpreter for structuring man-machine dialogue illustrated through several video disk applications in hematology.

Paul, J. L. (L) (A)
Department of Pathology
University of British Columbia
Vancouver, British Columbia V6T 1W5

Others: two others

Areas: computer vision, biomedical applications

Project(s): representing 2-D and 3-D properties of biological specimens.

Curran, David (L) (N)
30 W 39th Street
Vancouver, British Columbia V5Y 2N9

Areas: natural language processing, social issues

Turnquist, Gerald (S) (N)
The Cooperators
B.C. Credit Union
Vancouver, British Columbia

Areas: Lisp

Rowat, Peter (S) (N)
Dogwood AI Research
1826 West 1st Avenue
Vancouver, British Columbia V6J 1G5

Areas: expert systems, logic, planning

Project(s): expert system for forest management; expert system for avalanche forecasting; formalisation of reasoning about time and planning.

Moore, Wendy (P) (N)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Areas: natural language understanding

Havens, William (S) (A)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Others: Alan Mackworth, Robert Woodham

Areas: knowledge representation, computer vision

Project(s): schema based representations for visual knowledge and their applications to automatically interpreting images.

Mackworth, Alan (S) (A)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Others: Bill Havens, Robert Woodham, Ray Reiter

Areas: computational vision, knowledge representation

Project(s): knowledge representation for vision; sketch map understanding systems; remote sensing applications; logic for vision.

Woodham, Robert (P) (A)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Areas: computer vision

Project(s): photometric methods for computational vision; intermediate scene representations.

Rosenberg, Richard (D) (A)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Areas: natural language understanding, social issues

Project(s): computing presuppositions for natural language sentences; intelligent CAI.

Reiter, Ray (D) (A)
Department of Computer Science
University of British Columbia
Vancouver, British Columbia V6T 1W5

Areas: knowledge representation, logic, databases

Project(s): non-monotonic logic and its use in knowledge representation; default logic; logical foundations for database theory.

Jones, Will (P) (N)
Computing Centre
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Funt, Brian (S) (A)
Department of Computing Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Areas: computer vision, parallelism, cognitive modeling

Project(s): generalisation of 2-D retinex colour perception theory to 3-D; automatic interpretation of CT-scan images of sawlogs; automatic wire-routing using diagrams and a parallel processing retina

Hadley, Robert (S) (A)
Department of Computing Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Areas: computational linguistics, very general problem solving

Project(s): interpretation of natural language sentences especially of ambiguous quantified statements; a natural language query system for a Prolog database

Cercone, Nick (S) (A)
Department of Computing Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Others: Robert Hadley, Carol Murchison, Max Krause, Paul McFetridge

Areas: computational linguistics, knowledge representation (semantic networks), practical AI systems, computation in the humanities

Project(s): the automated academic advisor (expert) system; large natural language lexicons using perfect hash functions; annotated bibliography of computer-based literary and linguistic studies; parsing methods (CATN) with a semantic net representation; educational technology.

Calvert, Tom (S) (A)
Department of Computing Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Others: John Chapman

Areas: animation and simulation, computer vision for robotics

Project(s): development of languages and systems for computer simulation and animation of human movement with applications to dance and film-making; computer vision for a mobile robot.

Dahl, Veronica (D) (A)
Department of Computing Science
Simon Fraser University
Burnaby, British Columbia V5A 1S6

Others: Michael McCord, Harvey Abramson

Areas: computational linguistics, logic programming

Project(s): L3, translating Spanish into logic; logic data bases.

Campbell, Alan (D) (N)
P.O. Box 2542
Smithers, British Columbia V0J 2N0

Others: one programmer

Areas: expert systems

Project(s): PROSPECTOR; PROSPECTOR-II, an expert system framework to work on microsystems.

Elio, Renee (S) (N)
Alberta Research Council
Computing Department
11315 87th Avenue
Edmonton, Alberta T6G 2C2

Others: John Bettaan

Areas: expert systems, intelligent interfaces, human learning, natural language processing

Project(s): initiating meterological (storm forecasting) expert system.

Davis, Wayne (S) (A)
Department of Computing Science
University of Alberta
Edmonton, Alberta T6G 2H1

Areas: image processing, computer graphics, spatial data bases

Project(s): Formats and storage techniques for spatial data; DBMS for spatial data; analysis and enhancement of medical image data.

Schubert, Len (P) (A)
Department of Computing Science
University of Alberta
Edmonton, Alberta T6G 2H1

Others: Jeff Pelletier

Areas: knowledge representation, inference, natural language understanding

Project(s): preference parsing of generalised phrase structure grammars (and logical interpretation); general and special purpose inference for a question-answering system; speech generation; motion planning for robots.

Marsland, Tony (P) (A)
Department of Computing Science
University of Alberta
Edmonton, Alberta T6G 2H1

Areas: game playing, knowledge based research

Project(s): computer chess.

Sampson, Jeff (D) (A)
Department of Computing Science
University of Alberta
Edmonton, Alberta T6G 2H1

Areas: adaptive systems

Wilson, Kelly (D) (A)
Department of Computing Science
University of Alberta
Edmonton, Alberta T6G 2H1

Areas: cognitive science

Cross, Gerry (P) (N)
Mount Royal College
Calgary, Alberta T3B 1E8

Bramwell, Bob (G) (N)
Department of Computer Science
University of Calgary
Calgary, Alberta T2N 1M4

Areas: Lisp, symbolic manipulation languages, user interfaces

Project(s): on-line documentation system.

Cleary, John E. (S) (A)
Department of Computer Science
University of Calgary
Calgary, Alberta T2N 1M4

Areas: adaptive systems, cognitive science, logic programming (distributed execution)

Project(s): VLSI realisation of parallel adaptive systems; distributed evaluation of logic programs based on message passing and use of this to support intelligent understanding of simulation traces.

Unger, Brian (P) (A)
Department of Computer Science
University of Calgary
Calgary, Alberta T2N 1M4

Areas: distributed systems, simulation and modelling, prototyping software, expert systems and simulation

Project(s): JADE

McCalla, Gordon (L) (A)
Department of Computational Science
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0

Others: Blake Ward, Larry Reid, Kevin Murtagh, Jim Firby, Darwyn Peachey, Berni Schieffer

Areas: planning, intelligent tutoring, natural language understanding

Project(s): architectures for computer-assisted instruction; the use of planning techniques in intelligent tutoring; planning in dynamic microworlds; pragmatics issues in natural language interfaces; learning of procedures and data structures; student computing environments.

Goforth, David (P) (A)
Department of Computational Science
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0

Areas: computer assisted instruction

Project(s): LEPUS, a language to promote LOGO-style learning in domains of interacting entities.

Colbourn, Marlene (P) (A)
Department of Computational Science
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0
(now at Waterloo)

Areas: expert systems, computer applications in special education, combinatorial computing

Project(s): expert system to diagnose children's learning/reading difficulties.

Rambally, Gerald (P) (A)
Department of Computer Science
University of Regina
Regina, Saskatchewan

Areas: cognition, applications of AI in education

Gordon, Richard (L) (A)
Quantitative Morphology Unit
University of Manitoba
Winnipeg, Manitoba R3E 0W3

Others: one other

Areas: robotics

Project(s): automated techniques (robotics) for early detection of melanoma; computer controlled x-ray microbeam.

Benson, Maurice (P) (A)
Lakehead University
Thunder Bay, Ontario P7B 5E1

Areas: numerical analysis

Bauer, Mike (S) (A)
Department of Computer Science
University of Western Ontario
London, Ontario N6A 5B7

Areas: expert systems, man-machine interfaces, software engineering

Project(s): software development system including "experts" to aid in design, specification, and testing; sophisticated interfaces for office systems; use of Prolog as a apecification/prototype language

Ted Elcock (D) (A)
Department of Computer Science
University of Western Ontario
London, Ontario N6A 5B7

Areas: logic programming languages, theorem-proving

Davies, Julian (P) (A)
Department of Computer Science
University of Western Ontario
London, Ontario N6A 5B7

Areas: networks, programming languages, game-playing

Pylyshyn, Zenon (D) (A)
Centre for Cognitive Science
University of Western Ontario
London, Ontario N6A 5B7

Areas: cognitive science

Goebel, Randy (S) (A)
Department of Computer Science
University of Waterloo
Waterloo, Ontario N2L 3G1

Others: Martin van Emden

Areas: logic databases, logic programming

Project(s): DLOG: a representation language; Waterloo Unix prolog

van Emden, Martin (D) (A)
Department of Computer Science
University of Waterloo
Waterloo, Ontario N2L 3G1

Areas: logic programming

Rendell, Larry (S) (A)
Department of Computer Science
University of Guelph
Guelph, Ontario N1G 2W1

Others: Dave Coles, Jim Burgess

Areas: machine learning, cognition

Project(s): inductive inference particularly from elementary data in search; genetic systems; unification of approaches to generalisation.

Burke, Michael (S) (N)
AES Data Inc.
Missisauga, Ontario

Areas: expert systems

Ball, John Winston (S) (N)
GEAC Computers
350 Steelcase Road
Markham, Ontario L3R 1B3

Javey, Sharan (P) (A)
Department of Computer Science
York University
Downsview, Ontario

Areas: software design methods, computer simulation

Shibahara, T. (P) (N)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

Areas: knowledge representation, applications to robotics and medicine

Hirst, Graeme (S) (A)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

Areas: natural language understanding, knowledge representation

Project(s): semantic interpretation and handling ambiguity; knowledge representations to do this; parsers.

Perrault, Ray (S) (A)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

currently at SRI International, Menlo Park, California

Others: others at SRI

Areas: natural language understanding

Project(s): natural language pragmatics; speech-act theory; planning; natural language semantics.

Mylopoulos, John (P) (A)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

Others: John Tsotsos, Sol Greenspan, many graduate students

Areas: knowledge representation and applications to databases

Project(s): Procedural Semantic Nets [PSN] knowledge representation formalism - Alven (computer vision system for assessing the performance of the human heart's left ventricle) and CAA (analysing EKGs); TAXIS database formalism.

Tsotsos, John (D) (A)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

Others: John Mylopoulos, D. Covvey, many graduate students

Areas: computer vision, medical applications

Project(s): Alven - computer vision system for assessing the performance of the human heart's left ventricle; CAA - analysing EKGs; Hippocrates - a second generation medical consultant; knowledge based vision and the interpretation of visual motion.

Cohen, Robin (D) (A)
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A4

Areas: natural language understanding

Project(s): understanding the structure of arguments.

Browse, Roger (S) (A)
Department of Computer and Information Science
Queen's University
Kingston, Ontario K7L 3N6

Others: B. Butler, J. Glasgow, J. Kulick, S. Lederman, D. Mewhort, and others

Areas: computer vision, cognitive modelling, expert systems, image processing, robotic perception

Project(s): computational models of visual attention, foveation, and reading; edge detection and grouping in image understanding; logic programming for expert system development; medical imaging; robotic perception (visual, tactile, kinesthetic).

Kulick, Jeff (S) (A)
Department of Computer and Information Science
Queen's University
Kingston, Ontario K7L 3N6

Areas: computer vision, image processing

Project(s): medical imaging systems - 3-D tomography; automated diagnosis; vision for robots using parallel processors.

McNaughton, P. (S) (N)
RCMP
"V" Directorate
Ottawa, Ontario K1A 0R2

Goldberg, Morris (L) (A)
Department of Electrical Engineering
University of Ottawa
Ottawa, Ontario K1N 6N5

Others: P. Kourtz and others

Areas: expert systems, remote sensing

Project(s): develop an expert system for analysing remote sensing imagery (forestry).

Skuce, Doug (S) (A)
Department of Computer Science
University of Ottawa
Ottawa, Ontario K1N 6N5

Others: Stan Matwin

Areas: logic, logic programming, representation of knowledge, expert systems,

Project(s): LESK (Language for Exactly Stating Knowledge) a general purpose knowledge representation language which compiles into KNOWLOG, a Prolog derived logical language suitable for expert systems and natural langauge applications; intelligent backtracking in FOL deduction.

Oren, Tuncer (P) (A)
Department of Computer Science
University of Ottawa
Ottawa, Ontario K1N 6N5

Areas: knowledge based systems, applications of AI in software in general

LaLonde, Wilf (L) (A)
School of Computer Science
Carleton University
Ottawa, Ontario K1S 5B6

Others: four others

Areas: AI programming languages, AI machines, learning

Project(s): an actor machine for use in AI, applications based on the actor paradigm; learning (in particular the learning of language).

Peacocke, Dick (S) (N)
Bell Northern Research
Ottawa, Ontario

Others: group of 15 people

Areas: software engineering and metrics with possible application to AI

Project(s): measurements of software quality, costs, performance and reliability.

Bradford, James (S) (N)
Bell Northern Research
Ottawa, Ontario

Areas: man-machine interfacing, CAM (robotics), mathematical models of consciousness

Project(s): FLEX, and ATN based man-machine interface for various CAD/CAM systems; robotic sensors.

Kasvand, Tony (S) (N)
National Research Council
Ottawa, Ontario

Others: N. Abdelmalek, C. Merritt, S. Hung, N. Otsu, Y. Liu

Areas: image processing, demonstrations of applicability

Project(s): analysis of complex line structures; restoration and compression of images; analysis of vegetable chromosomes; binary lines.

Suen, Ching Y. (S) (A)
Department of Computer Science
Concordia University
Montreal, Quebec H3G 1M8

Areas: character recognition, computational linguistics, speech systhesis, computer analysis and generation of fonts

de Mori, Renato (D) (A)
Department of Computer Science
Concordia University
Montreal, Quebec H3G 1M8

Areas: speech understanding

Baylor, G. (D) (A)
Department de Psychologie
University of Montreal
Montreal, Quebec H3C 3J7

Areas: cognitive science, dreams

Kittredge, Richard (S) (A)
Department de Linguistique et Philologie
University of Montreal
Montreal, Quebec H3C 3J7

Others: Igor Mel'cuk

Areas: machine translation, natural language processing, representation of linguistic knowledge

Project(s): generation of text fragments from semantic networks in narrow sublanguages (using Prolog); study of tractability of various sublanguages of English and French for natural language processing and machine translation.

Zucker, Steve (P) (A)
Department of Electrical Engineering
McGill University
Montreal, Quebec

Areas: computer vision, visual perception

Project(s): mechanisms for human visual perception; theory of continuous relaxation and relaxation labelling; inspection and repair of hybrid circuits.

Levine, Martin (D) (A)
Department of Electrical Engineering
McGill University
Montreal, Quebec

Areas: computer vision, visual perception

Project(s): biomedical image processing; the use of robotics for inspection and repair of hybrid circuits.

Newborn, Monroe (D) (A)
Department of Computer Science
McGill University
Montreal, Quebec

Areas: game playing

Project(s): computer chess.

Pietrzkowski, T. (P) (A)
Department of Computer Science
Acadia University
Wolfville, Nova Scotia

Areas: logic programming, applications to graphical programming, intelligent user-interface

Tomek, Ivan (D) (A)
Department of Computer Science
Acadia University
Wolfville, Nova Scotia

Areas: education

Project(s): Josef: educational computer language.

Glicksman, Jay (S) (N)
Texas Instruments
Computer Science Laboratory
Dallas, Texas

Others: Byron Davies

Areas: computational vision, seismic image understanding

Project(s): applying computer vision techniques to the problem of representing geophysical knowledge and signal (seismic) to symbol transformations; advanced environments for expert users.

Smith, Reid (S) (N)
Schlumberger-Doll Research
Ridgefield, Conn.

Others: David Barstow, Gilles Lafue, Stephen Smoliar, others

Areas: expert systems, distributed problem-solving, knowledge representation

Project(s): well-log interpretation systems (e.g., dipmeter advisor); distributed object-oriented programming systems (spread across local networks); apprentice systems for well-log interpretation-systems that adjust their performance based on normal interactions with expert users.

Levesque, Hector (P) (N)
Fairchild AI Laboratory
4001 Miranda Avenue
Palo Alto, California 94303

Others: Ron Brachman, Phil Cohen, others

Areas: knowledge representation

Webber, Bonnie Lynn (P) (N)
Computer and Information Science Department
University of Pennsylvania
Philadephia, Pennsylvania

Others: Arvind Joshi, Tim Finin, Martha Palmer, Kathleen McKeown

Areas: natural language interaction

Kaniklipis, Constantine (P) (N)
Computer Science Department
New York University
New York, New York

Areas: computational linguistics

Holte, Robert C. (L) (N)
Tower C
Brunel University
UxBridge, England UB8 3PH

Others: Cognitive Engineering Group

Areas: machine learning

Project(s): the construction of autononous intelligence-machines able to keep up with the changing facts and demands of our everyday world.

Appendix 3 - Cross Reference List: Area of Interest <---> Researcher

Computational Vision / Image Processing / Pattern Recognition (16)

J. Paul (UBC), W. Havens (UBC), A. Mackworth (UBC), R. Woodham (UBC), B. Funt (SFU), T. Calvert (SFU), W. Davis (Alberta), J. Tsotsos (Toronto), R. Browse (Queen's), J. Kulick (Queen's), M. Goldberg (Ottawa), T. Kasvand (NRC), C. Suen (Concordia), S. Zucker (McGill), M. Levine (McGill), J. Glicksman (Texas Inst)

Natural Language / Computational Linguistics / Speech (19)

E. Chang (Victoria), D. Curran (Vanc), R. Rosenberg (UBC), W. Moore (UBC), N. Cercone (SFU), V. Dahl (SFU), R. Hadley (SFU), E. Renee (Alta RC), L. Schubert (Alberta), G. McCalla (Sask), G. Hirst (Toronto), R. Perrault (SRI), R. Cohen (Toronto), W. LaLonde (Carleton), C. Suen (Concordia), R. deMori (Concordia), R. Kittredge (Montreal), B. Webber (Penn), C. Koniklipsis (NYU)

Representation of Knowledge (13)

W. Havens (UBC), A. Mackworth (UBC), R. Reiter (UBC), B. Funt (SFU), N. Cercone (SFU), L. Schubert (Alberta), R. Goebel (Waterloo), T. Shibahara (Toronto), G. Hirst (Toronto), J. Mylopoulos (Toronto), D. Skuce (Ottawa), R. Smith (Schlumberger), H. Levesque (Fairchild)

Expert Systems / Applications (22)

E. Chang (Victoria), J. Paul (UBC), P. Rowat (Dogwood), N. Cercone (SFU), A. Campbell (Smithers), E. Renee (Alta RC), T. Marsland (Alberta), B. Unger (Calgary), M. Coulbourn (Sask-Waterloo), M. Bauer (UWO), M. Burke (AES), T. Shibahara (Toronto), J. Mylopoulos (Toronto), J. Tsotsos (Toronto), R. Browse (Queen's), M. Goldberg (Ottawa), D. Skuce (Ottawa), T. Oren (Ottawa), T. Kasvand (NRC), M. Levine (MGill), J. Glicksman (Texas Inst), R. Smith (Schlumberger)

AI in Education (5)

G. McCalla (Sask), D. Goforth (Sask), M. Colbourn (Sask-Waterloo), G. Rambally (Regina), I. Tomek (Acadia)

Issues in AI Programming (11)

G. Turnquist (Cooperators), R. Bramwell (Calgary), B. Unger (Calgary), M. Bauer (UWO), J. Davies (UWO), S. Jarvey (York), T. Oren (Ottawa), W. LaLonde (Carleton), R. Peacocke (BNR), T. Pietrzkowski (Acadia), I. Tomek (Queen's)

Man-Machine Interfaces (5)

E. Renee (Alta RC), R. Bramwell (Calgary), M. Bauer (UWO), J. Bradford (BNR), T. Pietrzkowski (Acadia)

Logic Programming (9)

P. Rowat (Dogwood), R. Reiter (UBC), V. Dahl (SFU), J. Cleary (Clagary), T. Elcock (UWO), R. Goebel (Waterloo), M. van Emden (Waterloo), D. Skuce (Ottawa), T. Pietrzkowski (Acadia)

Cognitive Science (9)

B. Funt (SFU), K. Wilson (Alberta), J. Cleary (Calgary), G. Rambally (Regina), Z. Pylyshyn (UWO), L. Rendell (Guelph), R. Browse (Queen's), J. Bradford (BNR), G. Baylor (Montreal)

Problem Solving and Search: Planning, Games (8)

P. Rowat (Dogwood), R. Hadley (SFU), T. Marsland (Alberta), G. McCalla (Sask), J. Davies (UWO), R. Perrault (SRI), M. Newborn (McGill), R. Smith (Schlumberger)

Robotics (7)

T. Calvert (SFU), R. Gordon (Manitoba), T. Shibahara (Toronto), R. Browse (Queen's), J. Bradford (BNR), S. Zucker (McGill), M. Levine (McGill)

Theorem Proving (2)

T. Elcock (UWO), T. Pietrzkowski (Acadia)

Learning and Adaptive Systems (6)

E. Renee (Alta RC), J. Sampson (Alberta), J. Cleary (Calgary), L. Rendell (Guelph), W. LaLonde (Carleton), R. Holte (Brunel)

Humanities and Social Issues (3)

D. Curran (Vancouver), R. Rosenberg (UBC), N. Cercone (SFU)

Appendix 4 - Questionnaire Data in Tabular Form

The graphs displayed throughout this report are presented here in tabular form, categorised according to the divisions used in the questionnaire.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
the federal government (through NSERC)	73	74	71
the federal government (through other agencies)	43	49	33
the provincial governments	37	38	33
private industry	48	49	48
research institutions (e.g. CIAR)	33	33	29
other (please specify)	7	5	10

Table A-1. Additional funds should be provided by.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
0 - $1,000,000	0	0	0
$1,000,000 - $10,000,000	10	15	5
$10,000,000 - $100,000,000	45	46	43
greater than $100,000,000	7	3	14

Table A-2. How much additional support is necessary.
(to fund Canadian AI over the next ten years)

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
solely for AI	13	15	5
for AI and other areas also (please specify)	55	59	48

Table A-3. Additional funds should be provided.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
release time for current AI workers	52	56	43
extra researchers	47	46	48
support staff	52	54	48
administrators	10	10	10
equipment	63	64	62
other (please specify)	10	13	5

Table A-4. Additional funds are needed most urgently for.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
concentrated in one or two "centres of excellence"	32	21	52
distributed widely across many places	43	51	29
other (please specify)	10	10	10

Table A-5. Should AI research be geographically.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
focussed largely on one or two main topics	17	10	29
distributed across a diversified range of topics	52	54	48
other (please specify)	13	13	14

Table A-6. Should AI research investigations be.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
largely practical results	70	69	71
largely theoretical results	57	56	57
other (please specify)	9	8	10

Table A-7. Should AI research be directed towards.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
primarily in universities	77	79	71
primarily by private industry	40	36	48
primarily in government labs.	13	13	14
other (please specify)	13	8	24

Table A-8. Should AI research and development be carried out.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
short-term goals	38	33	48
long-term goals	70	74	62
other (please specify)	7	3	14

Table A-9. Should AI research be focussed on.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
developing software	75	72	81
developing hardware	25	28	19
other (please specify)	10	10	10

Table A-10. Should AI research be oriented towards.

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
provider of information to the AI research community	68	67	71
provider of information to NSERC	47	49	43
provider of information to other government agencies	50	51	48
provider of information to private industry	43	44	43
provider of information to the general public	38	41	33
co-ordinator of Canadian AI policy	40	38	43
host of a Canadian AI conference	63	64	62
representative of Canada to the worldwide AI community	52	49	57

Table A-11. What role do you think will be most important.
(mentioned as important)

(O-overall; A-Academic; N-Non-academic)	percentage O	A	N
provider of information to the AI research community	60	62	57
provider of information to NSERC	33	28	43
provider of information to other government agencies	30	31	29
provider of information to private industry	12	10	14
provider of information to the general public	3	3	5
co-ordinator of Canadian AI policy	18	15	24
host of a Canadian AI conference	43	41	48
representative of Canada to the worldwide AI community	33	28	43

Table A-12. What role do you think will be most important.
(mentioned among the top 3 priorities)

Appendix 5 - Canadian AIer's outside of Canada

This appendix contains a list of the Canadians we know to be working in artificial intelligence outside of Canada at the present time.

Name	(degrees from)	Employment
James Allen	(PhD-Toronto)	Rochester
Harlyn Baker	(PhD-Stanford; BSc-UWO)	Stanford
Dan Berlin	(BSc-Toronto)	Stanford student
Alex Borgida	(PhD-Toronto)	Rutgers
Heinz Brew	(MSc-UBC)	Hewlett-Packard AI Lab
Philipe Brou	(BEng-McGill)	MIT
Jim Davidson	(MSc-UBC; PhD-Stanford)	Teknowledge Corp.
Byron Davies	(MSc-Cal Tech)	Texas Instruments AI Lab
Johan deKleer	(PhD-MIT; BSc-UBC)	Xerox Palo Alto Research Center
Jim desRivieres	(MSc-Toronto)	Xerox Palo Alto Research Center
Jim Firby	(BSc-Waterl; MEng-Sask)	Yale student
Mark Fox	(BASc-Tor; PhD-CMU)	CMU Robotics Institute
Jay Glicksman	(PhD-UBC)	Texas Instruments AI Lab
Eric Grimson	(PhD-MIT; BSc-Sask)	MIT
Austin Henderson	(PhD-MIT)	Xerox Palo Alto Research Center
Bob Holte	?	Brunel student
Dave Kashtan	(MSc-McGill)	SRI International
Hans Koomen	(MSc-UBC)	Rochester student
Hector Levesque	(PhD-Toronto)	Fairchild AI Lab
David Lowe	(BSc-UBC)	Stanford
David McDonald	(MSc-UBC; PhD-CMU)	?
John Mohammed	(MSc-McGill)	Fairchild AI Lab
Hans Moravec	(PhD-Stanford)	Carnegie-Mellon
Mary Papalaskaris	(MSc-Alberta)	Edinburgh student
P Patel-Schneider	(BSc-Waterloo; MSc-Tor)	Fairchild AI Lab
Ed Pennault	(BEng-McGill)	Stanford student
Ray Perrault	(PhD-Michigan)	SRI International
Chuck Rich	(PhD-MIT)	MIT
Charles Rosen	(BEng-McGill)	Machine Intelligence Corp.
Steve Rosenberg	(PhD-CMU)	Hewlett-Packard AI Lab
Joseph Schuehammer	?	MIT
Ted Shortliffe	(PhD-Stanford)	Stanford
Reid Smith	(PhD-Stanford)	Schlumberger-Doll Research
Brian Smith	(PhD-MIT)	Xerox Palo Alto Research Center
Dimitri Terzopoulos	(BEng, MEng-McGill)	MIT student
Blake Ward	(BSc-Sask)	Carnegie-Mellon student
Barbara White	(PhD-MIT)	Bolt Beranek and Newman

CIAR/Science Council Conference

Machines That Think, Sense and Act and Their Applications

The Science Council of Canada and the Canadian Institute for Advanced Research are jointly sponsoring a Conference on "Machines that think, sense and act and their applications" on 26-27 March 1984 in Ottawa at the Chateau Laurier Hotel. This conference was organised by Dr. Bill Tatton of the CIAR with attendance by invitation only. The CSCSI/SCEIO was consulted and some of the membership were invited. CSCSI/SCEIO will take advantage of this opportunity to host a hospitality suite from 5-6:00 pm on 26 March 1984 where the executive will be available. Anyone is welcome to drop in for the hospitality suite.

The agenda for this conference is reprinted on the following pages and the invitation list is also reprinted.

Editor's note: The invitation list has been omitted due to lack of space. Copies are available from N. Cercone.

Science Council of Canada
Conseil des sciences du Canada

The Canadian Institute for Advanced Research
L'Institut canadien des recherches avancées

AGENDA

CONFERENCE ON
MACHINES THAT THINK, SENSE AND ACT AND THEIR APPLICATIONS

CHATEAU LAURIER HOTEL, OTTAWA, ONTARIO

MARCH 26TH AND 27TH, 1984

MONDAY, MARCH 26TH, 1984

9:00 a.m. - 9:15 a.m.	-	J.F. Mustard, President, Canadian Institute for Advanced Research Introductory Remarks
Session I	-	MACHINES THAT THINK
Chairman	-	N. Cercone, Chairman, Department of Computing Science, Simon Fraser University
9:15 a.m. - 10:00 a.m.	-	P. Winston, A.I. Laboratory, M.I.T. The Problem of Knowledge Representation
10:00 a.m. - 10:30 a.m.	-	Questions and Discussion Period
10:30 a.m. - 10:45 a.m.	-	Coffee Break
10:45 a.m. - 11:15 a.m.	-	R. Reiter, University of British Columbia The Contribution of Fundamental Logic to the Development of Thinking Machines
11:15 a.m. - 11:45 a.m.	-	M. Seidenberg, McGill University Cognitive Sciences and the Development of Thinking Machines
11:45 a.m. - 12:15 p.m.	-	Questions and Discussion Period
12:15 p.m. - 1:45 p.m.	-	Lunch, followed by a report by N. Cercone on the Canadian Society for the Computational Study of Intelligence questionnaire
Session II	-	MACHINES THAT SENSE
Chairman	-	A. Mackworth, Associate Professor, University of British Columbia
1:45 p.m. - 2:30 p.m.	-	E. Hildreth, M.I.T. Computation in Sensory Processing
2:30 p.m. - 3:00 p.m.	-	Questions and Discussion Period

3:00 p.m. - 3:30 p.m.	-	M. Cynader, Dalhousie University Brain Mechanisms for Visual Sensing
3:30 p.m. - 3:45 p.m.	-	Coffee Break
3:45 p.m. - 4:15 p.m.	-	S. Zucker, McGill University New Developments in Machine Sensing
4:15 p.m. - 5:00 p.m.	-	Questions and Discussion Period
8:00 p.m.	-	J. Alvey, Senior Director Technology, British Telecom Public Lecture: Britain's Response to the Challenge of the Japanese Fifth Generation Project

TUESDAY, MARCH 27TH, 1984

Session III	-	MACHINES THAT ACT
Chairman	-	W.G. Tatton, Director and Professor, Playfair Neuroscience Unit University of Toronto
9:15 a.m. - 10:00 a.m.	-	J. Hollerbach, M.I.T. Overview of Strategies for the Control of Manipulative Devices
10:00 a.m. - 10:15 a.m.	-	Coffee Break
10:15 a.m. - 10:45 a.m.	-	Y. Lamarre, Université de Montréal Strategies employed by Living Systems for Movement Control: Applications to Robotic Devices
10:45 a.m. - 11:15 a.m.	-	G.M. Gentleman, N.R.C., Robotics Group Current and Future Developments in Robotic Control
11:15 a.m. - 12:00 noon	-	Questions and Discussion Period
Session IV	-	APPLICATIONS
Chairman	-	J. Mylopoulos, Department of Computer Science, University of Toronto
12:00 noon - 1:30 p.m.	-	Lunch

1:00 p.m. - 1:30 p.m.	-	M. Fox, Carnegie-Mellon University The Impact of Artificial Intelligence on Manufacturing
1:30 p.m. - 2:00 p.m.	-	Questions and Discussion Period
2:00 p.m. - 2:30 p.m.	-	D. Caplan, Montreal Neurological Institute Application of Computer Processing Models of Language to the Diagnosis and Treatment of Patients with Communication Disorders
2:30 p.m. - 3:00 p.m.	-	Questions and Discussion Period
3:00 p.m. - 3:15 p.m.	-	Coffee Break
3:15 p.m. - 3:45 p.m.	-	J. Seely Brown, Xerox, California Use of Sensing and Thinking Machines in Education
3:45 p.m. - 4:15 p.m.	-	Questions and Discussion Period
Session V	-	CLOSING LECTURE
4:15 p.m. - 4:45 p.m.	-	Z. Pylyshyn, University of Western Ontario What is Artificial Intelligence?
4:45 p.m. - 5:00 p.m.	-	Stuart L. Smith, Chairman Science Council of Canada Closing Remarks

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NSERC/Science Council

In a letter dated 29 December 1983, the Science Council of Canada informed participants and attendees of their January 20/21 (1983) Workshop on Artificial Intelligence of issues raised by Dr. Gordon MacNabb of NSERC. Dr. MacNabb's letter is reprinted on the following pages.

In a January 10, 1984 letter I directed some comments to Dr. MacNabb (copies to Dr. Stuart Smith, president of the Science Council of Canada and the CSCSI/SCEIO executive) which I believe were relevant. My letter is also reprinted following Dr. MacNabb's letter.

Science Council of Canada
Conseil des sciences du Canada
100 Metcalfe
Ottawa, Ontario
K1P 5M1

OUR REF. NO.
N/RÉFÉRENCE

YOUR REF. NO.
V/RÉFÉRENCE

29 December 1983

Nick J. Cercone
Chairman
Department of Computing Science
(Canadian Society for the Computational
Studies in Intelligence)
Simon Fraser University
Burnaby, B.C.
V5A 1S6

Dear Mr. Cercone:

The President of the Natural Sciences & Engineering Research Council of Canada, Mr. Gordon M. MacNabb, has formally expressed reservations about some sections of the proceedings of the Workshop on Artificial Intelligence organized by the Science Council on January 20/21 1983.

Inasmuch as you participated in the workshop and received a copy of the document in question, it was felt that you should be made aware of the concerns which have been raised. As a result a copy of the letter from Mr. MacNabb is attached.

Yours sincerely,

Eugene Nyberg

Eugene Nyberg,
Secretary of Council &
Director of Communications

Att.

EN/dyp

Natural Sciences and Engineering Research Council of Canada
Conseil de recherches en sciences naturelles et en génie du Canada

Ottawa, Canada
K1A 0R6

President
Président

November 23, 1983

Dr. Stuart Smith
President
Science Council of Canada
100 Metcalfe Street
Ottawa, Ontario
K1P 5M1

Dear Dr. Smith:

Report to the Science Council from a
WORKSHOP ON ARTIFICIAL INTELLIGENCE

I am writing you concerning the above noted document and some serious concerns and reservations I and my staff have relative to some of the observations contained therein. Before doing that however, I must observe that I am dismayed that a workshop on the subject of Artificial Intelligence, with considerable representation from the university community, would be held without the involvement of a representative of this Council. We must always be open to receive constructive criticism of our operations, but in all fairness we should be given an opportunity to defend our positions and to present information rather than having to react to an already published document which, in our view, is not factual in many respects. I do hope that this deficiency regarding participation will be corrected in future such workshop initiatives and I know that you share my concern in this regard.

With reference to the document itself, my comments will focus on pages 59 to 61 and two of the policy recommendations on pages 67 and 68.

cc Admin Cttee
Arthur Cordell 28/11 rec'd 28/11/83

.../2

6&5
working together travaillons ensemble
Canada

Canada

Page 59 last complete paragraph: I do not know who was presenting the role of this Council's programs, but the text of this paragraph would suggest that the NSERC grants are only "designed to support long-term research and personnel development". Most certainly our operating grants are designed for this purpose, but no reference is made to the Strategic Grants Program which is more short term and project oriented and which contains artificial intelligence as a clearly identified priority coming under the Communications and Computers Panel.

Page 60 second paragraph: The text and the media coverage of it have made it very clear that university researchers who attended the conference feel that they are "poorly served by NSERC" and argue that "improvement in funding is needed rapidly". Attached as Annex A hereto is a comparison of the levels of funding that have been made available to the university community active in computer science. A comparison is made of the last completed series of competitions compared to those of five years ago. This growth in research support (which excludes the added support provided through scholarship awards) is well above the average increase in the funding provided to all disciplines supported by the Council. Computer and Information Science was identified for the largest single increase in funding given to any discipline committee this year. While artificial intelligence is not specifically identified in this summation, it is so identified in the Strategic Grants Program and certainly is an area of priority activity in the eyes of the Grants Selection Committee for Computer and Information Science.

Page 60 third paragraph: While several suggestions were offered as to why NSERC support is "so low" in the eyes of the participants, nobody has apparently suggested that perhaps the applications we are receiving are sometimes fragmented and ill defined and therefore do not meet our overriding criterion of excellence. This was most definitely the case in a few instances in our recent Strategic Grants competition. As for the Computer and Information Science Committee for our Operating Grants, the secretary of that committee says that "I believe our GSC has tried to give priority to the area (AI) where we see excellence demonstrated". He goes on to note that major research installations have been supported recently for two of the

university participants at your workshop and an expert in the field of artificial intelligence is a new member of the Grant Selection Committee. With regard to the possibility that grant applications fall "between two stools", we strive to see that this does not happen and if applicants feel that such has been the case then they should bring it to our attention immediately. A statement that " no committee is particularly disposed towards the field of AI" is in no way supported by fact and I am sorry to see a published document include such a condemnation of our committee structure when there is no opportunity to correct this view during the workshop itself.

Page 60 last paragraph: Here again a total misrepresentation of NSERC policy is presented in the subjective phrase "and NSERC may not look favorably on research teams". Nothing can be farther from the truth. Approximately 50% of our applications in the Strategic Grants Program involve research teams and we have a specific Program of Operating Grants to support group grants. What frequently happens however, is that individual researchers shun a group approach as they want to have an NSERC grant in their own right. This does not mean however that a number of them operating with their individual grants do not collaborate on a joint research program. In any event, the statement could not be farther from the truth.

Also in this paragraph is the statement that "NSERC grants are designed for long-term research and some authorities question if most AI profits are of a long-term duration." This statement totally overlooks the existence of our Strategic Grants Program which is project oriented and entails grants up to a 3 year duration with a requirement for clear milestones and end objectives to be stated in the applications. It is also an area where group grants and joint university-industry interaction are strongly encouraged.

Policy recommendation 4: This recommendation urges that an NSERC committee should be set up to fund AI research in the universities as a special priority area. The Council is constantly beseiged by requests for special committees and special funds of money for various "priority" research endeavours. We must resist this fragmenation unless there is a significant number of qualified applicants and a reasonable level of excellence within the applications to support the administrative burden entailed by each committee. To date we have not seen this with regard to artificial intelligence and we feel that the specific support provided by Strategic Grants and the "priority" given the area within the Operating Grants is adequate for the time being. What we clearly require are better research proposals. If we get them, they will be funded.

Recommendation number 8: It is suggested that the Science Council, NRC or some other organization sponsor workshops to increase communication between all sectors of AI research development and commercialization in Canada. I suppose NSERC is one of the "other" organizations referred to and I can tell you that I have given approval in principle for a workshop designed to bring together university, government and industrial researchers in this area so that they can help us define areas within Artificial Intelligence where priority action is appropriate within Canada. The person who has proposed the workshop has made it very clear that once those priority areas are identified, the review of the resultant applications should be made within the existing peer committee structure of the Council. In other words, the applications must be of sufficient quality to compete with other applications in the broad field of computers and communications technology.

I hope these observations will be of some value to you. If they reflect a degree of annoyance and frustration, then I can only observe that that is the feeling of NSERC staff who are of the view that the report on the workshop misrepresents badly the position of Council and the efforts that have been made by us to provide a receptive environment for research in the area of Artificial Intelligence.

Yours sincerely,

G.M. MacNabb

P.S. You are free to make whatever distribution of this letter you might deem appropriate.

ANNEX A

FUNDING FOR COMPUTING AND INFORMATION SCIENCE

GRANT SELECTION COMMITTEE

	1978-79 (1983-84 $)			1983-84		
	No.	$000	$000/Grantee	No.	$000	$000/Grantee
Individual and Team Operating Grantees	239	2,522		328	5,824	
Strategic Operating Grants		-			1,233	
Infrastructure Grants		73			1,185	
Equipment Grants		15			1,325	
Total		2,610 (3,929)	10.7 (16.2)		9,567	29.2

Real increase over 5 years in total funds: 243%
" " " " " " funds/grantee: 180%

24.11.83

Simon Fraser University
Department of Computing Science
Burnaby, British Columbia V5A 1S6

10 January 1984

Dr. Gordon M. MacNabb, President
Natural Sciences and Engineering Research Council of Canada
Ottawa, Ontario CANADA K1A 0R6

Dear Dr. MacNabb:

It was with great interest that I read your letter of 23 November 1983 addressed to Dr. Stuart Smith of the Science Council of Canada. The Science Council sent me a copy on 4 January 1984 since I was a "participant" of their January '83 workshop on Artificial Intelligence (AI). I have the following comments which may be of interest to you.

1. My Canadian AI colleagues were concerned that only three invitations were extended to academics west of Ontario though fully one half of the active full-time Canadian AI researchers can be found in Universities west of Ontario. Of the three Westerners who were invited, two received invitations only upon reconsideration by the Science Council.

2. My invitation came at the last moment after the AI workshop was finalised and I was not asked to contribute in any way. Since I am the President of this Canadian AI society I tried to make a presentation on behalf of the Canadian Society for the Computational Studies of Intelligence/Societe Canadienne pour Etudes d'Intelligence par Ordinateur (CSCSI/SCEIO). Time was denied me by the Workshop Chairman, Mr. Jorge Miedzinski. After repeated attempts to present my case to Mr. Miedinski, he finally consented to allow me 5 minutes for a "CSCSI/SCEIO news broadcast" before lunch on the first day.

3. Many of my AI colleagues who have seen the Science Council report on this workshop were disappointed and disturbed by the report to some degree. In particular the Science Council report does not comment on the increasing importance of AI within Computing Science. The CSCSI/SCEIO is currently compiling the results of a questionnaire on artificial intelligence (including policy questions) in Canada. The discussion of this vital economic, pedagogic, and academic issue is ignored by the Science Council and left to private conversations amongst the concerned parties. Hopefully the results of the questionnaire will interest the Science Council.

4. I do not believe that there is an expert in the field of artificial intelligence on the present Grant Selection Committee for Computer and Information Science (pg 3 of your letter). I respect the fact that many constraints must dictate the choice of committee members, but I feel that it is past due that now one constraint must be the recognition of the national importance of AI. At least may we have one committee member who acknowledges the importance of AI within Computing Science. In the recent past some committee members have been openly hostile to AI.

5. I assume that I am identified as one of the two university "participants" of the Science Council workshop who received a major installation grant - "The Simon Fraser Information Communication System Experiment", Nick Cercone, Don George, Bill Richards. This application was pending at the time of the Science Council workshop and its status was unknown at that time. The major project initiated under this grant is certainly an AI application (the Automated Academic Advisor) but the grant was intended to help establish the Laboratory for Computer and Communication Research (LCCR) at Simon Fraser and to assist 10 other projects for NSERC supported users at SFU. Most of these projects are not directly related to AI, e.g., VLSI design, distributed database systems, concurrency control problems, etc. I have attached the first annual report of the LCCR for your information; the annual report for this major installation grant will be sent to NSERC within a week.

6. Although Computing Science support from NSERC has increased markedly in recent years, on a relative scale to other experimental sciences requiring equipment, post-doctoral support, infrastructure support, etc. it still lags significantly in the level of support given to other disciplines. For example, the following table illustrates the average operating grant for a representative sample for some disciplines (source: Contact and NSERC President's report):

	1982/83	1983/84	Percent Change
Cellular Biology	$24,282	$27,016	+11.2
Chemistry	$25,828	$29,667	+14.8
Physics	$20,225	$22,658	+12.0
Computer Science	$14,929	$16,859	+12.9
Electrical Engineering	$17,233	$18,960	+10.0

This is not meant as a criticism of NSERC but as a petition that NSERC continue its present policy of recognising the growing importance of Computing Science in general and identify more explicitly AI's increasingly important role in the Computer and Information Science committee. AI is listed under some categories (area of application codes for Operating Grants) as a social science.

7. Under the Communications and Computers Panel 47 awards were made in 1983/84 for a total of 3.4 million dollars. Of these 47 awards only one can be identified as an AI strategic grant. This may reflect the lack of proposals or even the lack of good proposals from AIers, nevertheless it could be made more explicit that this Panel has identified AI as a "clearly identified priority".

8. The Science Council is co-sponsoring a "conference" on artificial intelligence along with the Canadian Institute for Advanced Research (Dr. William Tatton of the C.I.A.R. is the organiser). It will be held 26-27 March 1984 in Ottawa. The details are a little sketchy at this point but I am sure Dr. Tatton will be happy to provide information to you regarding this event. I have enclosed a copy of a letter I sent to Dr. Tatton after I was informed of this meeting.

Finally, I would like to acknowledge and express my appreciation of NSERC's fine performance to provide research support in Canada. Since I regularly review proposals for both NSF (in the U.S.A.) and NSERC I believe that NSERC has, to a large extent, made research monies more readily accessible to a wider range of qualified engineers and scientists.

I hope these comments are of use to you. I do believe that a spirit of co-operation should prevail in this ever competitive world in which we live. Certainly Canada is well endowed with skill and expertise to compete internationally and compete well. It is a shame to see our expertise and skill wasted from time to time because of misunderstandings which occur between well-intentioned organisations. If I can provide information to you in the future please do not hesitate to write.

Yours Sincerely,

Nick Cercone
Chairman, Department of Computing Science
President, CSCSI/SCEIO

cc Dr. Stuart Smith, President Science Council of Canada
Dr. Gordon McCalla, Vice President, CSCSI/SCEIO
Dr. John Tsotsos, Secretary, CSCSI/SCEIO
Dr. Wayne Davis, Treasurer, CSCSI/SCEIO

/enclosures

NEXT EXECUTIVE

The nominating committee suggests the following slate of candidates for the next CSCSI/SCEIO executive:

Chairman - Gordon McCalla, Computational Science Dept., Univ. of Saskatchewan

Vice Chairman - John Tsotsos, Computer Science Dept., Univ. of Toronto

Secretary - Mike Bauer, Computer Science Dept., Univ. of Western Ontario

Treasurer - Wayne Davis, Computing Science Dept., Univ. of Alberta

The CSCSI/SCEIO constitution allows for further nominations to be sent to the chairman if the nominating slate is unacceptable. A mail ballot will then be conducted by the secretary. Since we are running a bit late this year, if there are further nominations, they must be received by 21 March 1984. The next executive will serve from 1 June 1984 until 31 May 1986.

Prospectus

COMPUTATIONAL STUDIES OF INTELLIGENCE

An International Journal Sponsored by the CSCSI/SCEIO

Published Quarterly beginning in 1985

AIMS

- promote Artificial Intelligence (AI)
- promote Canadian as well as international scholarly AI research
- encourage communication among subareas of AI, retard isolation of subareas
- stimulate AI research that advances the state-of-the-art
- provide a forum for both experimental and theoretical research

SCOPE

- refereed original articles accessible to a general AI audience
- articles from all areas of AI are encouraged
- experimental and theoretical research, surveys, impact studies
- style - comparable to IEEE Computer, ACM Computing Surveys - premium on readability
- content - focus on particular research project or related group of projects undertaken by a particular researcher or research group
- style and content are both crucial
- encourage issue-oriented presentations
- relate techniques employed to general AI open problems

JUSTIFICATIONS

- as AI matures it is important to publish results in journals, the traditional medium of scholarly communication.

- there are not enough journals to publish the growing volume of AI research.

- our editing experiences (Guest editors of IEEE Computer special issue on Knowledge Representation; guest editor of Computers and Mathematics special issue on Computational Linguistics; general and program chair of 4th CSCSI/SCEIO) has convinced us that there is a demand for:

  (1) specific project description papers;
  (2) papers with informal presentation style;
  (3) papers that emphasize how the accomplishments and goals of a project relate to the general issues and open problems of the subarea of which the project is a part;
  (4) papers that show interconnections to general AI; and
  (5) papers with strong experimental bias.

  In particular, the IEEE Computer special issue on "knowledge representation" illustrates both the need for and possibility or writing papers of this sort. These papers, however, were shorter and more diffuse than what we evisage. Before final editing, the original versions of many of these papers were longer and less tutorial and would have served as prototypes for papers in the CSI journal.

- AI generally and AI results should be made more accessible to technically sophisticated audiences, not particularly in AI.

- CSI would be different from current AI publications:

  AI Magazine is not refereed, publishes articles of less theoretical importance and of varied quality, advertises, has many newsletter aspects, and emphasizes American contributions to AI.

  AI Journal tends to favour long submissions with a formal presentation style, logically and mathematically sophisticated content, and has long publication delays.

  Cognitive Science is aimed primarily at psychological and linguistic modelling rather than artificial intelligence in its full generality.

  American Journal for Computational Linguistics is a special interest publication focussing on natural language understanding.

  IEEE Transactions on Pattern Analysis and Machine Intelligence has not yet begun to disseminate AI results, instead concentrating on pattern recognition.

  International Journal of Man-Machine Studies centres on the interface between humans and computers and, although occasionally publishing general AI research, has not established an explicit AI orientation.

  Robotics journals - there are a growing number of special-purpose robotics journals; all address a narrow subarea within AI.

ROLE OF CSCSI/SCEIO

- CSCSI/SCEIO would be the sponsoring society for CSI.

- the CSI editor must be a member of the CSCSI/SCEIO and satisfy the same requirements as members of the CSCSI/SCEIO executive

- the editor is responsible to the CSCSI/SCEIO executive Major changes in the aims or scope of CSI or a change of editorship would be the responsibilities of the CSCSI/SCEIO executive in consultation with the general membership of the CSCSI/SCEIO.

- the CSCSI/SCEIO newsletter should be separate from the journal

- there could be a CSCSI/SCEIO "information page/editorial" in the journal

DUTIES OF EDITORIAL PERSONNEL

Editor(s)

- co-ordinate journal; responsible for journal
- set editorial policy (e.g., maintain aims and scope of CSI, ensure high standards in content and style of CSI, achieve widespread AI balance, etc.)

- select board members and associate editors with the approval of the CSCSI/SCEIO executive
- receive submitted manuscripts and co-ordinate review process
- correspond with authors
- commission special issues
- farm-out papers to associate editors
- occasionally perform the duties of associate editor

Associate Editors

- solicit contributions to CSI
- take responsibility for the refereeing process (perhaps using members of the editorial board)
- accept/reject refereed papers
- help co-ordinate and/or suggest special issues
- attend occasional meetings of journal
- offload duties of editor

Editorial Board -

- act as referees for specific areas of AI
- find referees
- help promote journal to colleagues
- provide input to associate editors

TERMS OF OFFICE

- all CSI editorial personnel serve at their own discretion (i.e., they can resign) or at the discretion of the editor (i.e., they can be "fired")
- editor serves at the discretion of the CSCSI/SCEIO (executive and membership)
- no fixed terms for CSI editorial personnel (ongoing turnover is expected)

MISCELLANEOUS

- quarterly journal, approximately 125 pages per issue, 500 pages per volume, 5 papers per issue

- circulation of approximately 3-4,000 (500 Canadian, 1000 American, 1000 International, 500-1000 libraries/institutions)

- bilingual (English and French) editorials, abstracts, instructions; papers accepted in English or French

INSTRUCTIONS TO AUTHORS

- as per National Research Council of Canada journal publications

- we would endeavour, through the large editorial board, to ensure a very rapid turn-around in refereeing.

Final draft

Constitution for CSCSI/SCEIO

Article I - Name

This organization shall be called the Canadian Society for Computational Studies of Intelligence/Societe Canadienne des Etudes d'Intelligence par Ordinateur, herafter referred to as CSCSI/SCEIO.

Article II - Purpose

A. CSCSI/SCEIO is organized and will be operated exclusively for educational and research purposes in the interest area of the Computational Studies of Intelligence and in the furtherance thereof.

B. The society will promote the interests of professionals by:

1. Setting up study groups which will investigate and report on relevant major issues.

2. Organizing both seminar and tutorial meetings.

3. Publishing the CSCSI/SCEIO newsletter containing information of interest to members.

4. Forging and maintaining informed links with with Government, Industry and other societies with similar goals.

5. Other appropriate means.

No addition may contradict the main purpose stated in Article II.A above.

Article III - Membership

A. Membership is open to any person upon payment of dues as determined from time to time by the Executive Committee of CSCSI/SCEIO.

B. Applicants for membership shall submit their applications to the Secretary of CSCSI/SCEIO.

C. The membership of any member of CSCSI/SCEIO will be terminated if he or she:

1. fails to pay dues within 30 days of the date on which they are payable;

2. resigns his membership in CSCSI/SCEIO, such resignation being effective after 30 days notice to the Secretary.

Article IV - Officers

A. The governing body of CSCSI/SCEIO shall be the Executive Committee. Its members shall consist of the four officers of CSCSI/SCEIO: the Chairman, the Vice-Chairman, the Secretary and the Treasurer.

B. The duties of the Chairman include:

1. Calling and presiding at meetings of the Executive Committee and of CSCSI/SCEIO;

2. Appointing all standing and ad hoc committees;

3. Appointing ad hoc and standing committee Chairmen and others as required;

4. Appointing members to fill elective offices that may become vacant between elections through resignation or ineligibility of an incumbent officer.

C. The duties of the Vice-Chairman include:

1. Presiding at meetings in the absence of the Chairman;

2. Assuming the duties of the Chairman in the event of the Chairman's resignation or incapacity;

3. Assuming any duties delegated by the Chairman.

D. The duties of the Secretary include:

1. Keeping minutes of business meetings of CSCSI/SCEIO and of the Executive Committee;

2. Maintaining records and correspondence of CSCSI/SCEIO;

3. Notifying members of the Executive Committee of the time, place, and agenda of the Committee meetings;

E. The duties of the Treasurer include:

1. Supervising the financial affairs of CSCSI/SCEIO;

2. Maintaining and reporting financial records of CSCSI/SCEIO;

3. Reporting CSCSI/SCEIO finances annually.

F. The Chairman, Vice-Chairman, Secretary and Treasurer shall be elected by the members of CSCSI/SCEIO to terms of office of two years, beginning June 1 of even-numbered years.

Article V - Election of Officers

A. The Chairman shall appoint a nominating Committee by November 30th in each of odd-numbered year. This committee will nominate at least one candidate for each elective office and secure acceptance of nominees. The nominating committee shall inform the members of CSCSI/SCEIO of its slate of candidates, and solicit further nominations from the members at that time.

B. Ballots will be mailed first class from and returned to the Chairman not later than February 28th of each even-numbered year; they shall be mailed to all CSCSI/SCEIO voting members. Ballots shall state the last day for return of a voted ballot. This date shall be at least 30 days after the last ballots are mailed. Of the ballots returned, a plurality of votes cast for each office determines the winner of that office.

C. The ballots will be counted and all members of CSCSI/SCEIO shall be informed of election results no later than April 1 of each even-numbered year.

Article VI- Meetings

A. At least one business meeting of CSCSI/SCEIO will be held every other year.

Article VII- Amendments

A. 1. A resolution by a simple majority of the Executive Committee shall be sufficient to cause a constitutional amendment to be voted on by CSCSI/SCEIO members. An amendment can be proposed to the Executive Committee by any of its own members, or by any member of CSCSI/SCEIO.

2. A petition of 10% of the members shall be sufficient to cause a constitutional amendment to be voted on by CSCSI/SCEIO members. The right to petition shall be independent of any decisions taken in accordance with the above Article VII..A.1.

B. The proposed amendment shall be voted on by the following mail balloting procedure:

1. The ballots shall be mailed out by first-class mail from (and returned to) the Chairman. The ballot shall include (i) a copy of the proposed amendment including a specification of the date on which it will become effective; (ii) a copy of the article(s) in the existing bylaws that is (are) being proposed for amendment.

cont'd.....

2. Only ballots received by the Chairman postmarked within thirty days after the last ballot was mailed out shall be valid.

C. The amendment shall become effective if it is approved by a two-thirds majority of all valid ballots.

Article VIII - Dissolution

In the event of dissolution of CSCSI/SCEIO, all assets of the Society will be transferred to the members. Dissolution shall be by constitutional amendment.

Simon Fraser University
Department of Computing Science
Burnaby, British Columbia V5A 1S6

CSCSI/SCEIO

22 February 1984

Dr. C. T. Bishop, Editor in Chief
Research Journals
National Research Council of Canada
100 Sussex Drive
Ottawa, Ontario CANADA K1A 0R6

Dear Dr. Bishop,

Since our telephone conversation in December we have sent the enclosed questionnaire and abbreviated prospectus to 204 of our AI colleagues in Canada (96), the United States (96), and Europe (12). There are approximately 1500 active researchers in the world who would consider their major interest to be Artificial Intelligence so we have sampled reaction from but a few. From these 204 questionnaires we received 107 responses (52.5 percent response) thus far; we enclose copies of the completed questionnaires for your information.

We summarise the results of this short questionnaire as follows:

* 90.7 percent (97 people) of the respondents believe there is a need for a new AI journal.

* 90.7 percent (97 people) of the respondents believe the prospectus appropriately describes such a new journal.

* 91.6 percent (98 people) of the respondents believe there to be enough activity in AI to sustain a new journal on an ongoing basis.

* 81.3 percent (87 people) of the respondents believe the proposed journal would attract quality papers to publish.

* 59.8 percent (64 people) of the respondents would be willing to serve on the editorial board.

* 74.8 percent (80 people) of the respondents would be willing to review papers for such a new journal.

* 66.4 percent (71 people) of the respondents would be willing to submit papers on a regular basis.

* 32.7 percent (35 people) of the respondents would be willing to submit papers on an infrequent basis.

We enclose the following for your information:

(1) a copy of the questionnaire and abbreviated prospectus which we sent to 204 artificial intelligence researchers;

(2) a list of the questionnaire respondents and their affiliations including a summary of the substantive comments pertaining to the prospectus;

(3) a copy of the actual responses; and

(4) a copy of the October, 1983 IEEE Computer journal which we edited.

We will be revising the prospectus to account for the relevant suggestions we received from the questionnaire we distributed and will send that to you soon. Based on the "additional comments" supplied us by our colleagues we would appreciate any comments you feel are appropriate.

We are excited by the enthusiastic support from the AI community, especially in Canada and North America. We are ready to mount the effort required to develop the first volume for 1985 since we have approximately five months left of our sabbatical year's time remaining for close, productive collaboration together. In order to plan, solicit articles, and coordinate our activities to begin publishing in 1985 we will invite your feedback and suggestions as soon as it is possible for you to do so. We feel it is important to start making invitations for a first issue by the end of March/beginning of April if we are to meet a 1985 start date. Thank you once again for your kind consideration in this matter.

Yours Sincerely,

Nick Cercone, Chairman Computing Science,
President CSCSI/SCEIO

Gordon McCalla, Vice President CSCSI/SCEIO

/enclosures

cc Barbara Drew, Publishing Manager, NRC
John Tsotsos, Secretary CSCSI/SCEIO
Wayne Davis, Treasurer CSCSI/SCEIO

Questionnaire - Computational Studies of Intelligence

Discussions with colleagues around North America and comments from a recent questionnaire sent to members of the CSCSI/SCEIO have convinced us of the need for a new journal in artificial intelligence. Partly due to our recent editorial experiences (IEEE Computer, special issues of the International Journal of Computers and Mathematics (Permagon Press), Fourth CSCSI/SCEIO conference, etc.) but mostly because of the apparent need, we have petitioned the National Research Council of Canada to publish a new international journal in Artificial Intelligence - Computational Studies of Intelligence - on behalf of the CSCSI/SCEIO.

Instructions: please check all that apply

1. I have read the enclosed prospectus and believe

   ___ there is a need for a new artificial intelligence journal

   ___ the prospectus appropriately describes (more or less) such a new journal

   ___ there is enough activity in artificial intelligence to sustain a new journal on an ongoing basis

   ___ if published, CSI would attract quality papers in artificial intelligence

2. I would be willing to

   ___ serve on the editorial board of CSI

   ___ review papers for CSI

   ___ submit papers to CSI on a 'regular' basis (a paper every few years)

   ___ submit papers to CSI on a more infrequent basis than 'regular'

3. Please make any additional comments below that you feel are appropriate concerning this proposal

   _____

   _____

   _____

   _____

   _____

Optional

Name: _____

Affiliation: _____

_____

Telephone: _____ (home) _____ (office)

Prospectus

COMPUTATIONAL STUDIES OF INTELLIGENCE

An International Journal Sponsored by the CSCSI/SCEIO

Published Quarterly beginning in 1985

AIMS

- promote Artificial Intelligence (AI)
- promote Canadian as well as international scholarly AI research
- encourage communication among subareas of AI, retard isolation of subareas
- stimulate AI research that advances the state-of-the-art
- provide a forum for both experimental and theoretical research

SCOPE

- refereed original articles accessible to a general AI audience
- articles from all areas of AI are encouraged
- experimental and theoretical research, surveys, impact studies
- style - comparable to IEEE Computer, ACM Computing Surveys - premium on readability
- content - focus on particular research project or related group of projects undertaken by a particular researcher or research group
- style and content are both crucial
- encourage issue-oriented presentations
- relate techniques employed to general AI open problems

JUSTIFICATIONS

- as AI matures it is important to publish results in journals, the traditional medium of scholarly communication.

- there are not enough journals to publish the growing volume of AI research.

- our editing experiences (Guest editors of IEEE Computer special issue on Knowledge Representation; guest editor of Computers and Mathematics special issue on Computational Linguistics; general and program chair of 4th CSCSI/SCEIO) has convinced us that there is a demand for:

  (1) specific project description papers;
  (2) papers with informal presentation style;
  (3) papers that emphasize how the accomplishments and goals of a project relate to the general issues and open problems of the subarea of which the project is a part;
  (4) papers that show interconnections to general AI; and
  (5) papers with strong experimental bias.

  In particular, the IEEE Computer special issue on "knowledge representation" illustrates both the need for and possibility or writing papers of this sort. These papers, however, were shorter and more diffuse than what we evisage. Before final editing, the original versions of many of these papers were longer and less tutorial and would have served as prototypes for papers in the CSI journal.

Prospectus

- AI generally and AI results should be made more accessible to technically sophisticated audiences, not particularly in AI.

- CSI would be different from current AI publications:

  AI Magazine is not refereed, publishes articles of less theoretical importance and of varied quality, advertises, has many newsletter aspects, and emphasizes American contributions to AI.

  AI Journal tends to favour long submissions with a formal presentation style, logically and mathematically sophisticated content, and has long publication delays.

  Cognitive Science is aimed primarily at psychological and linguistic modelling rather than artificial intelligence in its full generality.

  American Journal for Computational Linguistics is a special interest publication focussing on natural language understanding.

  IEEE Transactions on Pattern Analysis and Machine Intelligence has not yet begun to disseminate AI results, instead concentrating on pattern recognition.

  International Journal of Man-Machine Studies centres on the interface between humans and computers and, although occasionally publishing general AI research, has not established an explicit AI orientation.

  Robotics journals - there are a growing number of special-purpose robotics journals; all address a narrow subarea within AI.

ROLE OF CSCSI/SCEIO

- CSCSI/SCEIO would be the sponsoring society for CSI.

- the CSI editor must be a member of the CSCSI/SCEIO and satisfy the same requirements as members of the CSCSI/SCEIO executive

- the editor is responsible to the CSCSI/SCEIO executive Major changes in the aims or scope of CSI or a change of editorship would be the responsibilities of the CSCSI/SCEIO executive in consultation with the general membership of the CSCSI/SCEIO.

- the CSCSI/SCEIO newsletter should be separate from the journal

- there could be a CSCSI/SCEIO "information page/editorial" in the journal

DUTIES OF EDITORIAL PERSONNEL

Editor(s)

- co-ordinate journal; responsible for journal
- set editorial policy (e.g., maintain aims and scope of CSI, ensure high standards in content and style of CSI, achieve widespread AI balance, etc.)

- select board members and associate editors with the approval of the CSCSI/SCEIO executive
- receive submitted manuscripts and co-ordinate review process
- correspond with authors
- commission special issues
- farm-out papers to associate editors
- occasionally perform the duties of associate editor

Associate Editors

- solicit contributions to CSI
- take responsibility for the refereeing process (perhaps using members of the editorial board)
- accept/reject refereed papers
- help co-ordinate and/or suggest special issues
- attend occasional meetings of journal
- offload duties of editor

Editorial Board -

- act as referees for specific areas of AI
- find referees
- help promote journal to colleagues
- provide input to associate editors

TERMS OF OFFICE

- all CSI editorial personnel serve at their own discretion (i.e., they can resign) or at the discretion of the editor (i.e., they can be "fired")
- editor serves at the discretion of the CSCSI/SCEIO (executive and membership)
- no fixed terms for CSI editorial personnel (ongoing turnover is expected)

MISCELLANEOUS

- quarterly journal, approximately 125 pages per issue, 500 pages per volume, 5 papers per issue

- circulation of approximately 3-4,000 (500 Canadian, 1000 American, 1000 International, 500-1000 libraries/institutions)

- bilingual (English and French) editorials, abstracts, instructions; papers accepted in English or French

INSTRUCTIONS TO AUTHORS

- as per National Research Council of Canada journal publications

- we would endeavour, through the large editorial board, to ensure a very rapid turn-around in refereeing.

Computational Studies of Intelligence

Proposed by:

Nick Cercone, Computing Science Department, Simon Fraser University
Gordon McCalla, Computational Science Department, University of Saskatchewan

Part I - Questionnaire Respondents <22-Feb-84>

Legend

(E) - is willing to serve on the editorial board
(R) - is willing to review articles
(S) - is willing to submit articles "regularly"
(s) - is willing to submit articles "infrequently"

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Part II - Responses to CSI Questionnaire <22-Feb-84>

107 responses
(57-Canada 45-U.S.A 1-Japan 2-Great Britain 1-France 1-Sweden)

204 questionnaires sent (96 Canada 96 U.S.A. 12 Other)

52.5 percent responded by 22 February 1984

Of those 107 researchers responding,

percent	people	
90.7	97	there is a need for a new AI journal
90.7	97	the prospectus appropriately describes (more or less) such a new journal
91.6	98	there is enough activity in AI to sustain a new journal on an ongoing basis
81.3	87	if published, CSI journal would attract quality papers in AI
59.8	64	willing to serve on the editorial board of CSI journal
74.8	80	willing to review papers for CSI journal
66.4	71	willing to submit papers to CSI on a 'regular' basis (a paper every few years)
32.7	35	willing to submit papers to CSI on a more infrequent basis than 'regular'

Part III - Responses to CSI Questionnaire <22-Feb-84>

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2. Gerald Rambally, U of Regina, 5-jan-84
#3. Morris Goldberg, U of Ottawa, 6-jan-84
#4. John Pugh, Carleton U, 6-jan-84
5. Ernest Chang, U of Victoria, 6-jan-84
#6. Tom Calvert, SFU, 6-jan-84
#7. James Bradford, Bell-Northern Research, 6-jan-84
#8. Alan Mackworth, UBC, 9-jan-84
#9. Stan Matwin, U of Ottawa, 9-jan-84
#10. Len Schubert, U of Alberta, 9-jan-84
#11. Michael Bauer, U of W Ontario, 9-jan-84
12. Jeffrey Sampson, U of Alberta, 9-jan-84
#13. William Havens, UBC, 9-jan-84
#14. Larry Rendell, U of Guelph, 9-jan-84
#15. Richard Rosenberg, UBC, 9-jan-84
16. Janice Glasgow, Queens U, 9-jan-84
17. Brian Schaefer, CRC, 9-jan-84
18. D. J. K. Mewhort, Queens U, 9-jan-84
19. ????????????, Toronto, 9-jan-84
#20. Dave Goforth, U of Saskatchewan, 10-jan-84
#21. F. H. Roosen-Runge, York U, 10-jan-84
22. Igor Melcuk, U of Montreal, 10-jan-84
23. Martin Levine, McGill U, 10-jan-84
24. Roger Browse, Queens, 10-jan-84
#25. R. DeMori, Concordia U, 10-jan-84
#26. D. J. M. Davies, U of W Ontario, 11-jan-84
#27. Brian Butler, Queens, 11-jan-84
#28. F. J. Pelletier, U of Alberta, 11-jan-84
29. M. J. Colbourn, U of Saskatchewan, 11-jan-84
#30. Monty Newborn, McGill U, 12-jan-84
#31. Robin Cohen, U of Toronto, 12-jan-84
32. John Tsotsos, U of Toronto, 12-jan-84
#33. Steve Tanimoto, U of Washington, 12-jan-84
#34. Ching Suen, Concordia U, 12-jan-84
35. Neil Stewart, U of Montreal, 13-jan-84
#36. Wilf LaLonde, Carleton U, 13-jan-84
37. ????????????, Menlo Park Ca, 13-jan-84
38. David Wilkins, SRI, Menlo Park Ca, 13-jan-84
#39. M. G. Strobel, U of Montreal, 16-jan-84
40. Gerry Cross, Mount Royal College, 16-jan-84
#41. Tuncer Oren, U of Ottawa, 16-jan-84
42. Tetsutaro Shibahara, U of Toronto, 16-jan-84
#43. John Sowa, IBM Systems Research Institute, 16-jan-84
#44. Nils Nilsson, SRI, 16-jan-84
#45. Johan de Kleer, Xerox PARC, 16-jan-84
#46. Doug Skuce, U of Ottawa, 17-jan-84
#47. Graeme Hirst, U of Toronto, 17-jan-84
#48. Peter Rowat, Dogwood AI Research, 17-jan-84
#49. Dick Peacocke, Bell Norther Research, 17-jan-84
#50. Timothy Finin, U of Pennsylvania, 17-jan-84

#51. Anthony Ortony, U of Illinois, 17-jan-84
#52. Norman Badler, U of Pennsylvania, 18-jan-84
#53. Yoshiak Shira, Electrotechnical Lab, Toyko, 18-jan-84
#54. Randall Davis, MIT AI Lab, 18-jan-84
#55. Jay Glicksman, Texas Instruments, 18-jan-84
#56. James Allen, U of Rochester, 18-jan-84
#57. Bonnie Lynn Webber, U of Pennsylvania, 18-jan-84
#58. Christopher Riesbeck, Yale U, 18-jan-84
#59. Steve Rosenberg, Hewlett-Packard Labs, 18-jan-84
#60. ?????????????, MIT AI Lab, 18-jan-84
#61. Douglas Appelt, SRI, 18-jan-84
#62. Zenon Pylyshyn, U of W Ontario, 19-jan-84
#63. Paul Gilmore, UBC, 19-jan-84
#64. Sharon Salveter, Boston U, 19-jan-84
#65. Rob Cameron, SFU, 20-jan-84
66. Mark Fox, Carnegie-Mellon U, 20-jan-84
#67. Jon Doyle, Carnegie-Mellon U, 20-jan-84
#68. Scott Fahlman, Carnegie-Mellon U, 20-jan-84
#69. Aaron Sloman, U of Sussex, U.K., 20-jan-84
#70. Charles Rich, MIT AI Lab, 20-jan-84
#71. David McDonald, U of Massachusetts, 20-jan-84
#72. Hector Levesque, Fairchild AI Labs, 20-jan-84
73. T. Pietrzykowski, Acadia U, 23-jan-84
#74. Abe Lockman, Rutgers U, 24-jan-84
75. Drew McDermott, Yale U, 25-jan-84
76. Dick Kittredge, U of Montreal, 27-jan-84
#77. ???????????, Queen's U, 28-jan-84
#78. Arvind Joshi, U of Pennsylvania, 17-jan-84
79. Stuart Shapiro, SUNY Buffalo, 17-jan-84
#80. Robert Wilensky, UC Berkely, 23-jan-84
#81. Jim des Rivieres, Xerox PARC, 23-jan-84
#82. Ethan Scarl, MITRE Corp, 23-jan-84
#83. ????????????, Pittsburgh, 23-jan-84
#84. Daniel G. Bobrow, Xerox PARC, 23-jan-84
#85. David Waltz, U of Illinois, 24-jan-84
#86. N. S. Sridharan, Rutger's U, 24-jan-84
87. Robert J. Bobrow, BBN Laboratories, 25-jan-84
#88. Jim Schmolze, BBN Laboratories, 25-jan-84
#89. David Israel, BBN Laboratories, 25-jan-84
#90. Michael G. Dyer, UCLA, 26-jan-84
#91. Gio Wiederhold, Stanford U, 27-jan-84
92. Jim Howe, U of Edinburgh, 27-jan-84
#93. E. H. Shortliffe, Stanford U, 27-jan-84
#94. Wayne Davis, U of Alberta, 30-jan-84
#95. Ray Reiter, UBC, 31-jan-84
#96. Gian Piero Zarri, CNRS-LISH Paris, 20-jan-84
#97. J. Michael Brady, MIT AI Lab, 24-jan-84
98. Veronica Dahl, SFU, 30-jan-84
#99. W. W. Bledsoe, U of Texas, 31-jan-84
100. Gilles M. E. Lefue, Schlumberger Doll Research, 31-jan-84
#101. J. Guy Meunier, U du Quebec a Montreal, 1-feb-84

102. Latfi A. Zadeh, UC Berkeley, 3-feb-84
#103. David R. Hill, U of Calgary, 8-feb-84
#104. Tony Kasvand, National Research Council, 7-feb-84
#105. Eric Sandewall, U of Linkoping, 8-feb-84
106. Randy Goebel, U of Waterloo, 13-feb-84
107. Brian Funt, SFU, 19-feb-84

made additional comments

Part IV - Substantive Comments
(to consider for Prospectus changes)

1. Publication of experimental results and offer special issues on specific application areas or approaches.
2. Accept advertisements on (i) AI related products; and (ii) AI related jobs.
3. Could shorten title to Computational Intelligence.
4. The proposal should include more about the use of computer networks for submission/ refereeing/ editorial conferences and even electronic publishing on CDN net.
5. 500 copies in Canadian circulation?
6. Have special issues on a given topic every so often.
7. Policy concerning CSCSI conference papers? (submission to CSI encouraged/discouraged?)
8. Encourage the journal to undertake "special issues" directed to certain topics or detailed papers.
9. Guarantee rapid publication time.
10. Except for AI journal no other publication is dedicated solely to AI.
11. Bilingual aspect unique.
12. Fast turnaround important.
13. Enough expertise in Canada to support quality.
14. As an additional aim identify and support by reporting areas of potential specialisation in Canada.
15. Increasing bilingual interaction might be a goal.
16. See the scope aimed more at philosophical issues than the prospectus implies.
17. Question about the value of "the traditional medium of scholarly communication". Better computer-based media which would stimulate both research and applications much more effectively ... networking software geared to conferencing and software exchange.
18. Make it a good Canadian journal which solicits papers from around the world.
19. Change the title.
20. Add a section on announcements, etc. a la CACM.
21. Emphasize survey papers on Canadian AI to encourage gov't and industry support.
22. Underestimates the amount of support staff required.
23. 1000 is a more realistic number for subscriptions.
24. There is a need for an AI journal that contains applications with details and practical results.
25. Editorial board shouldn't be too large, create a sense of "team" with meetins.
26. Invite leading experts on tutorial and survey papers on important AI topics.
27. Put emphasis on practical applications.
28. I don't really see the need for a new, general AI journal. Any lack of papers of the kind cited in the prospectus in the existing journals appears to be the result of lack of submissions rather than journal policies.
29. NRC instructions to authors are inadequate to cover the specific format required for programmed processes.
30. Another AI journal is seriously needed since there are 2 or 3 and perhaps 5,000 researchers in the field.
31. The prospectus is not complete without a plan to publicise the journal extensively throughout the AI world to attract subscribers and authors.
32. Is the journal to be self-supporting, how would the CSCSI be liable for losses, could it also be supported by other AI societies (AAAI, AISB, etc) by giving their members discounts, in return for having subscriptions included on their membership forms?

33. There is definitely a need for another AI journal besides "AIJ".
34. The current AI journals tend to be dominated by a Stanford-MIT-CMU emphasis. There is good work being done elsewhere and there should be a broader coverage of research.
35. AI Journal's long review time is not unique to AIJ. CSI would suffer from this also if they strove for high-quality refereeing.
36. I am not convinced that we need yet another new Journal. There are ones springing up all over the place. It sounds like what you really want is a Canadian AI Journal or a place to publish your lower quality articles and still count as a publication for tenure decisions. You should work harder identifying ... a 3 month turnaround journal.
37. The proposal is excellent and well timed.
38. The surge in popularity of AI has been astounding. The AI journal is not only behind by over a year but has tended to emphasise mathematical (e.g., search) papers. There is a need for a more general AI-5th generation computing journal. The CSCSI conferences will themselves provide much input.
39. There is a need ... I feel confident that the CSCSI can do a first rate job with it.
40. There is a need for something between AIJ and Cog Sci, this might be it.
41. Journal will suffer seriously if it tries to "promote Canadian research". It would be a serious mistake to "nationalise" some part of a scientific field. Otherwise sounds fine.
42. The authors ... give a very accurate description of the current array of AI-related publications ... I strongly support this proposal.
43. Special issues on subareas (papers drawn from workshops, conferences, etc) should be encouraged.
44. It will be a mistake to have a bilingual journal if you plan to appeal to an audience outside Canada.
45. Publishing articles in French is to me a negative factor, but I can see the politics involved. I worry about the tutorial aspect emphasised in the prospectus, the IEEE issue cited was pretty worthless.
46. See long extremely thought provoking letter from Ø61.
47. Concern is expressed for strictly surveyish type papers.
48. It will require very vigorous efforts during the first year to get high quality submissions from outside Canada.
49. In Britain, cuts in educational funding make it difficult for a University library to take out new journal subscriptions unless the price is quite low.
50. If too high a proportion of the article turn out to be in French this could severely restrict the number of subscribers.
51. You should accept articles which may have appeared in one form in conference proceedings.
52. I would be interested in a more "serious" journal ... something more like IEEE Transactions on Software Engineering than Computer Magazine.
53. The CSCSI/SCEIO has a very good reputation among my American colleagues that I'm sure would carry over to the journal.
54. Strong editorial direction is needed for success.
55. Badly needed! include papers comparing approaches to AI problems.
56. The need is very critical.
57. The emphasis placed on style should be balanced with that of content.
58. Adding a new journal to the field will fragment it even more. I recommend against a new journal.
59. There is considerable fragmentation ... CSI can help bring things together by promoting papers that are commissioned and will attempt to synthesise, survey and develop new perspectives.

60. The success of this venture is virtually guareenteed by the need. Expand the scope slightly to include a range of technical sophistication, from IEEE Computer to the AI Journal.
61. Too many French articles, sadly, but realistically, may limit circulation.
62. CSI, as described, stands a good chance to fill the gap between AI Magazine and AI Journal.
63. In order to attract continuing international attention it might be best to focus on one area of AI. Such an area should be one where there is particular strength in Canada and good contact with international colleagues. Based on my impressions of the IEEE Computer issue Knowledge Representation may be such a subarea.
64. Sounds like a good idea if quality refereeing coupled with rapid turnaround is achieved.
65. The scope of the journal will have to be broad. It should also be Canadian with an international content and circulation. Supported by tax dollars requires it to be Canadian.
66. To make it fly it is essential that the editors and editorial board be truly international and consist of well-known researchers.
67. The title seems to underline the computational aspect of intelligence not the "artificial" - "formal" aspect.
68. I have some reservations about "project descriptions" - there have been too many bad such around and I would instead encourage people to write serious analyses of other people's work to get away from the advertising style of writing.
69. The fuzzy borders of AI should be captured in your "net". The dichotomy betwen "AI people" and "not AI people" should be reduced with mutual effort from both sides.
70. The title "Expert Systems and Machine Cognition" would suit the journal better. CSI opens the door to studies of human intelligence measurement studies. The suggested title spells out explicitly the emphasis a new journal ought to have.