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ARTIFICIAL INTELLIGENCE AND LANGUAGE PROCESSING

A DIRECTORY OF RESEARCH PERSONNEL

DONALD E. WALKER

STANFORD RESEARCH INSTITUTE

MENLO PARK, CALIFORNIA 94025

SRI Project 3706. This directory was prepared for the Department of Health, Education, and Welfare National Institute of Education, under Contract 400-75-0010.

SUMMARY

In the summer of 1974, SRI was asked by the National Institute of Education to compile a directory of persons engaged in research on artificial intelligence who are interested specifically in language processes. This task was one of several undertaken to help NIE evaluate the potential contribution of such activities to the explanation of the processes involved in comprehending spoken and printed messages. The requirement was specified as follows:

> A directory which identifies persons who are regularly contributing to the literature, shows their organizational affiliations, and expresses in 200 words or less their major research interests. The focus of the directory will be upon AI researchers interested in modeling or otherwise explaining language processes;

Following the initial compilation of the directory, which was submitted to the NIE in February 1975, a few additional entries were received. These entries are included in this revision, together with a few changes in addresses. However, it has not been possible to make systematic corrections or to follow up a third time on failures to reply to the original questionnaire. I apologize for any errors in the contents and regret that some people missed seeing the notices requesting information. If there is sufficient interest in the directory, it might be possible to maintain it on a continuing basis.

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QUESTIONNAIRE FORM

A DIRECTORY OF PERSONS DOING RESEARCH ON ARTIFICIAL INTELLIGENCE AND LANGUAGE PROCESSING

Name .....

Institution .....

Mailing Address .....
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.....
.....

Telephone .....

Major research interests in the area of artificial intelligence and language processing (200 words or less):

Further characterize your beliefs by circling entries on the following list, adding items that you believe are appropriate:

1-System Building, 2-Question Answering, 3-Speech Understanding,
4-Comprehension, 5-Instruction, 6-World Modeling,
7-Belief Modeling, 8-Planning, 9-Decision Making,
10-Protocol Analysis, 11-Discourse Analysis,
14-Problem Solving, 15-Inference, 16-Logic, 17-Deduction,
18-Induction 19-Syntax, 20-Semantics, 21-Pragmatics,
22-Language Acquisition

List your most important publications and reports in the area of artificial intelligence and language processing on the back of this page (or attach such a listing).

[Return to D. E. Walker, Stanford Research Institute, Menlo Park, California 94025.]

SUMMARY OF INTERESTS

Specific Interests Identified
(157 entries)

1.	System Building	63
2.	Question Answering	91
3.	Speech Understanding	36
4.	Comprehension	84
5.	Instruction	22
6.	World Modeling	78
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18.	Induction	38
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21.	Pragmatics	80
22.	Language Acquisition	27
	no interests indicated	7

Other Interests Listed

phonology
description of visual information
speech production
theory of learning
recognition of synonymous utterances
natural language interface for scene analysis
modeling the reading process
SDI
human memory
conceptual analysis
robot ethics
transformational grammar
sentence parsing systems
communication
machine control
conceptual graphs
theoretical psychology
cable television

ENTRIES IN THE DIRECTORY

(no responses were received from names in parentheses)

Prof. Robert P. Abelson
Mr. James F. Allen
Prof. Jonathan Allen
Mr. Robert A. Amsler
Dr. Thomas D. Arkwright
Dr. Norman I. Badler
Dr. Naqib A. Badre
(Prof. Robert F. Barnes)
Dr. Madeleine Bates
M. Gerard Battani
Mr. John B. Bennett
Prof. H. D. Block
Dr. Daniel G. Bobrow
Mr. Alexander T. Borgida
Dr. David Brown
Mr. Geoffrey Brown
Ms. Gretchen P. Brown
(Dr. John Seely Brown)
Dr. Bertram C. Bruce
Dr. Daniel J. Buehrer
Ms. Candace L. Bullwinkle
Dr. Harry C. Bunt
Mr. John F. Burger
(Dr. Richard Burton)
(Dr. Alan Campbell)
Prof. Wallace L. Chafe
Dr. Eugene Charniak
Dr. Daniel Chester
Mr. Philip R. Cohen
Dr. Kenneth Mark Colby
Dr. L. Stephen Coles
Dr. Allen M. Collins
(Dr. Alain Colmerauer)
Dr. Fred J. Damerau
Dr. D. Julian M. Davies
Ms. Barbara Gross Deutsch
Dr. Timothy C. Diller
Mr. George S. Dunham
Mr. Horace Enea
Mr. Martin Epstein
Dr. Lee D. Erman
Dr. Arthur Farley
Prof. Nicholas V. Find
Mr. Dick H. Fredericksen
Dr. Carl H. Frederiksen
Prof. Joyce Friedman
(Dr. Teiji Furugori)
Mr. Donald R. Gentner
Dr. Joseph Goguen
Dr. Neil M. Goldman
(Dr. Ira Goldstein)
Dr. Ralph Grishman
Mr. Louis Gross
Mr. Richard W. Grossman
Ms. Carole D. Hafner
Prof. Larry R. Harris
Dr. Patrick Hayes
Mr. Philip J. Hayes
Dr. Frederick Hayes-Roth
Dr. David G. Hays
Dr. George E. Heidorn
Dr. Gary G. Hendrix
(Dr. Annette Herskovits)
Dr. Jerry R. Hobbs
Mr. Stephen Isard
Dr. Dale W. Isner
Mr. Martin Janta-Polczynski
Prof. Sara R. Jordan
Prof. Aravind K. Joshi
Dr. Ronald M. Kaplan
Ms. Peggy M. Karp
(Mr. Martin Kay)
Dr. Charles Kellogg
Dr. Maija Kibens
Prof. Sheldon Klein
Mr. John William Klovstad
Prof. Manfred Kochen
Prof. Elliot B. Koffman
Mr. Rand B. Krumland
(Mr. John L. Kuhns)
Mr. Michel Lacroix
Dr. S. P. J. Landsbergen
Dr. Rick LeFaivre
Dr. James Levin
Prof. Robert K. Lindsay
Prof. H. C. Longuet-Higgins
Mr. Clinton Prentiss Mah
Dr. Ashok Malhotra

Dr. William C. Mann
Mr. Richard S. Marcus
Dr. William A. Martin
Dr. Gary R. Martins
Mr. Gerald B. Mathias
(Prof. John McCarthy
Mr. George W. McCon e
Mr. Drew Vincent McDermott
Mr. David McDonald
Dr. Piet Medema
M. Henri Meloni
Dr. Perry L. Miller
Prof. Jack Minker
(Prof. Marvin Minsky)
Dr. Kenneth L. Modesitt
Dr. Christine A. Montgomery
Dr. James A. Moore
Mr. Robert C. Moore
Prof. John A. Moyne
Prof. John Mylopoulos
Dr. Robert Allen Nado
Prof. Makoto Nagao
Mr. Seiichi Nakagawa
Mr. Kazuo Nakamura
Ms. Bonnie L. Nash-Webber
Prof. Allen Newell
Prof. Donald A. Norman
Mr. Gordon S. Novak, Jr.
Mr. John C. Olney
Prof. Michael H. O'Malley
Dr. Milos G. Pacak
Dr. Jacob Palme
(Prof. Seymour Papert)
(Dr. Robert Pasero)
Dr. Pearl R. Paulson
Mr. William H. Paxton
Dr. C. Raymond Perrault
Dr. Stanley R. Petrick
Dr. Brian Phillips
Dr. Alain Pirotte
Dr. Warren J. Plath
Mr. Vaughan R. Pratt
Dr. Anne-Louise Guichard Radimsky
Prof. D. Raj Reddy
Prof. Larry H. Reeker
Prof. Walter Reitman
Dr. Charles J. Rieger
Dr. Christopher K. Riesbeck
Mr. John Roach
Ms. Ann E. Robinson
Dr. Jane J. Robinson
(Dr. David Rumelhart)
Dr. Naomi Sager
Prof. Toshiyuki Sakai
Dr. Morris Salkoff
Dr. Erik Sandewall
Dr. Remko J. H. Scha
Prof. Roger Schank
Dr. Greg W. Scragg
Prof. Stuart C. Shapiro
Mr. Peter B. Sheridan
Dr. Edward H. Shortliffe
Prof. Laurent Siklossy
Prof. Robert F. Simmons
Mr. Jonathan Slocum
Mr. Michael Kavanagh Smith
(Dr. Robert L. Smith)
Dr. Norman K. Sondheimer
Mr. John F. Sowa
(Dr. Rolf Stachowitz)
(Prof. Patrick Suppes)
Dr. Alan L. Tharp
(Dr. Bozena Henisz Thompson)
Ms. Carol H. Thompson
Mr. Craig W. Thompson
(Prof. Frederick B. Thompson)
Mr. Jun-ichi Tsujii
Dr. Francis Douglas Tuggle
Prof. Leonard Uhr
Dr. Eric Van Utteren
Dr. Donald E. Walker
Prof. David L. Waltz
Ms. Eleanor H. Warnock
Dr. Donald Arthur Waterman
Mr. Ralph M. Weischedel
Dr. Yorick Wilks
Prof. Terry Winograd
Dr. Pierre Wodon
Dr. William A. Woods
(Prof. Lotfi Zadeh)

ARTIFICIAL INTELLIGENCE AND LANGUAGE PROCESSING

A Directory of Research Personnel

Prof. Robert P. Abelson
Psychology Department
2 Hillhouse Avenue
Yale University
New Haven, Connecticut 06520

Phone--203:436-8496

My major interest is in modeling simple ideological systems. In prior work, it has become clear that ideological interpretations of events, while highly "hypothesis-driven" rather than "data-driven", are nevertheless sensitive to mundane realities. The ideologist must have knowledge of the physical and social world, even if he biases many interpretations in the service of his values.

Thus I have been led into theorizing which attempts to link conceptual entities at various levels of abstraction, from simple events to motivated sequences of actions comprising plans, to thematic relationships between personal or national actors determining what plans they will pursue and how their competitive or cooperative plans interrelate.

This theorizing has consequences for story generation and understanding, for question answering, and for protocol analysis.

Interests--2,4,6,7,8,10,12,15,21

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Mr. James F. Allen
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A7
Canada

Phone--416:928-6027

My general research interests lie with speech understanding and language processing. In particular, I am most interested in the 'higher levels' of language understanding (i.e., semantics, syntax, user and dialogue models) as applied to the speech analysis problem. The signal processing and classification aspects of the area are only regarded as tools for the above.

Interests--3,6,11,13,19,20,21

****

Prof. Jonathan Allen
MIT, Room 36-575
Cambridge, Massachusetts 02139

Phone--617:253-2500

Major interest is text-to-speech conversion and speech understanding. This has led to studies in lexical structure, morphological analysis, letter-to-sound rules, lexical stress rules, morphophonemics, parsing, and semantic relations. Most recent interest has been in effects of modality items on pitch contours, and duration effects. I am also interested in the way these structural levels interact, which suggests a multiprocess model, since no structural level can sustain a complete analysis at its own level.

Interests--3,5,7,11,12,13,19,20

****

Mr. Robert A. Amsler
Computer Science Department
University of Texas
Austin, Texas 78712

Phone--512:471-5029

Computational Lexicology - Computational Linguistic Semantics
Analysis of the semantic knowledge contained in the dictionary for the purpose of building descriptive and procedural data structures to represent the meanings of words.

Analysis of the relationship between natural language descriptions of pictorial material (photos, drawings, etc.) and the storage and retrieval of this material for use in QA systems or data management applications.

Connotative Meaning - Analysis of techniques for analyzing and using connotative meaning in the context of natural language processing systems (Question-Answering, Generation).

Interests--2,4,6,7,11,12,13,20

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Dr. Thomas D. Arkwright
Automated Systems Division
Defense Language Institute
Monterey, California 93940

Phone--none listed

Research interests: computer-written programs; phonological models; statistics

Interests--1,14,15,phonology

****

Dr. Norman I. Badler
Computer and Information Science
Moore School
University of Pennsylvania
Philadelphia, Pennsylvania 19174

Phone--215:243-5862

I have been investigating the transformation of visual data from motion pictures into English descriptions. The descriptions are based on a hierarchy of concepts derived from an analysis of temporal picture data, low level motion concepts, and linguistic concepts such as adverbs, prepositions, and verbs. The final description is in a canonical case structure for motion verbs. The cases are obtained by an analysis of what sort of information was obtainable from the picture data, a world model of objects and object properties, and the context of the described scenario. The case representation enables comprehension of a scenario to be tested by question-answering techniques from natural language understanding systems.

I have also been working on the comprehension of simple mechanical diagrams at the linguistic level; using higher level inference rules to linguistically derive the expected motions of objects rather than base the description on calculations from the laws of physics.

Interests--1,4,6,15,22,description of visual information

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Dr. Nagib A. Badre
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-2637

My major research interest centers on computational systems for processing natural language (not necessarily connected with human language models) and particularly the formal specification of such systems. I am particularly interested in the following three levels of processing: syntax, semantics and pragmatics in the sense of shallow inferences of a deductive or inductive

type.

I am also interested in the problem of modeling human language behavior.

Interests--2,4,6,7,11,15,18,19,20,21,22

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Prof. Robert F. Barnes
Department of Philosophy
Lehigh University
Bethlehem, Pennsylvania 18105

(no response received)

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Dr. Madeleine Bates
Mathematics
Boston University
Boston, Massachusetts 02215

Phone--none listed

I am currently developing a syntactic component for BBN's speech understanding system, with particular emphasis on the relationship of syntax to the other types of knowledge which the system uses. I am also working on an augmented transition network grammar for spoken English. I am interested in studying the problems of language comprehension by model building, and in various aspects of psycholinguistics, and in language acquisition as relates to language comprehension.

Interests--1,3,4,14,19

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M. Gerard Battani
Groupe Intelligence Artificielle
UER de Luminy
70 Route Leon Lachamp
13288 Marseille Cedex 2
France

Phone--none listed

Continuous speech understanding: Taking as input a string of phonemes, the program tries to understand the meaning of the sentence uttered by a speaker. (The input string is obtained from a segmenter-recognizer program whose input is the output of a 14-channel vocoder; the string contains many errors.) This errorful string is parsed with a generalized type 0 grammar,

using the programming language PROLOG. There are two set of rules: phonological rules that take into account the errors of segmentation and recognition of phonemes, and syntactical rules for parsing the sentence. These two parts are embedded in one parser using a top-down strategy with backtracking. The output of the parser is a deep structure. A part of the program tries to understand the recognized sentence, using semantics and pragmatics of the world in which it works, and, if it succeeds, to answer the operator s question. If it doesn't, it asks for another parsing of the string the parser is non-deterministic) until it can answer or stop. The whole program (phonology, syntax, and semantics) is written in PROLOG.

Interests--2,3,13,14,16,17,19,20,21

****

Mr. John B. Bennett
Computer Science Department
1210 W. Dayton Street
University of Wisconsin
Madison, Wisconsin 53706

Phone--608:262-2196

I am investigating the problems involved in determining the sense of a verb from cues contained with the sentence in which the verb occurs. Most verbs have multiple senses which are frequently unrelated or related only very obscurely. People are generally able to identify the intended sense of a verb very precisely, and in most cases without recourse to context or other factors outside the individual sentence. It seems clear that this identification is not done via memorization (from experience) of the association between particular verb senses and the agents, objects, etc., which occur with them. Rather, cues are contained within the meaning of the agents, objects, etc., which point to the intended use of a particular sense of the verb.

The research into this small (which is not to say easy) problem has led to consideration of larger issues in natural language understanding. These include lexical memory, semantic primitives, pragmatics, structures for maintaining semantic knowledge, and semantic cases.

Interests--4,19,20,21,22

****

Prof. H. D. Block
Theoretical and Applied
Mechanics
Cornell University

Ithaca, New York 14850

Phone--607:256-5064; 256-5062; 272-6096(home)

Learning Machines, Brain Models, Robotics, Natural Language Acquisition by a Robot, Bionics (particularly as applied to Perception (Visual and Auditory) and Language). Evolutionary and Adaptive Systems, Neural Networks.

Interests--1,6,7,15,18,19,20,21,22

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Dr. Daniel G. Bobrow
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304

Phone--415:493-1600

Language comprehension and the cognitive structures and operations that underlie it. We believe that the best method for studying this topic is to build computer systems which perform some significant language comprehension task. The construction of such systems serves two functions -- there is a gain in our understanding of human language use by making our theories operational; at the same time we pave the way towards applications of natural language comprehension in practical computer systems. We are building an initial prototype system which carries on a purposeful dialog with a person.

Interests--1,2,4,6,11,13,19,20,21

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Mr. Alexander T. Borgida
Department of Computer Science
University of Toronto
Toronto, Ontario M5R 1C9
Canada

Phone--none listed

Large-scale implementation (and design) of systems which understand natural language sentences. Present research involves large syntactic grammars and how these can be combined with semantic information (nets, case frames, etc.) to produce improved systems.

In the future, I might be interested in "learning" programs for acquiring linguistic knowledge and how these might be made to look more like the human learning process.

Interests--4,6,19,20,22

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Dr. David Brown
Applied Mathematics
University of Witwatersrand
1 Jan Smuts Avenue
Johannesburg, 2001, South Africa

Phone--none listed

Interests: Concept formation and its possible application to the learning of natural language. Some techniques have been developed using a production system approach for the learning of very simple languages such as those of bridge bidding or poker betting. Emphasis is placed on the pragmatic content of an utterance -- what does a person (or a machine) mean when he says "three spades" or "raise you 2"? The use of a limited domain of discourse should make the problem more tractable than trying to encompass the richness and variety of English in one go.

Interests--none indicated

****

Mr. Geoffrey Brown
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Department of Computer Science
Rutgers University
New Brunswick, New Jersey 08903

Phone--none listed

System building, speech understanding, comprehension, world modeling, belief modeling, discourse analysis, conversational analysis, semantics, pragmatics

Interests--1,3,4,6,7,11,13,20,21

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Ms. Gretchen P. Brown
Automatic Programming Group
MIT Project MAC
545 Technology Square
Cambridge, Massachusetts 02139

Phone--617:253-3510

My major focus right now is on modeling conversation in a two participant console session environment. This is part of the OWL system being developed by the Project MAC Automatic Programming Group. I have made side excursions into

understanding of connected text and some special areas of English generation (building on work done for my Masters Thesis). In the near future, I expect to be doing more work on dialogue and giving a lot of thought to English generation.

Interests--2,4,6,7,8,9,11,12,13,14,19,20,21

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Dr. John Seely Brown
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138.

(no response received)

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Dr. Bertram C. Bruce
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Phone--617:491-1850, ext. 330

My main interest is in understanding how goals are translated into actions, and, the converse, how actions can be interpreted as components of a goal directed plan. I am especially interested in the ways in which plans and purposes are reflected in language use. Recognition of the plan underlying an action requires a model of the actor, a discourse (or action) history, and concepts such as patterns of behavior and social, as opposed to physical, actions.

Currently I am working on the application of these ideas to speech understanding.

I am also interested in general problems of knowledge representation. These include representations of events with their case structures and representations of incompletely (or even incorrectly) specified data. I have also been interested in problems of representing time ordered knowledge, and in concept learning.

Interests--2,3,4,7,11,12,13,15,18,19,20,21

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Dr. Daniel J. Buehrer
B-1E MacLean Hall
University of Iowa
Iowa City, Iowa 52242

Phone--319:353-6885

Major Research Interests: automatic theorem proving and induction

Interests--2,15,17,18

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Ms. Candace L. Bullwinkle
MIT AI Laboratory
545 Technology Square
Cambridge, Massachusetts 02139

Phone--617:253-5867

Major Research: I have recently completed a project for the M.S. (written up as my M.S. thesis): a pragmatic model of the sentence completion task. Sentence completion is a task generally requested of students in national exams which measures their reading and language ability. My work centers on exams for primary grade children and I have studied the kinds of knowledge and proposed a knowledge structure for several test examples. A LISP program interprets the test examples and uses the knowledge in the database, along with the knowledge given in the sentences of the exam to decide how best to complete the sentence. Currently, I am pursuing research in semantics of language in the domain of the personal assistant project, with the plan of organizing a frame hierarchy of the linguistic knowledge needed for such semantic problems as anaphora, presupposition, time and tense and semantic disambiguation.

Interests--6,19,20,21

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Dr. Harry C. Bunt
Artificial Intelligence Group
Philips Research Laboratory WB3
Eindhoven, The Netherlands

Phone--040:74 25 44

1. Natural language question-answering. Engaged in the design and implementation of an English language question answering system, specifically involved in the design of the semantic analysis component.

2. Theories about natural language understanding, and systems embodying such theories.

3. Theories concerning knowledge representations and methods for putting these to effective use.

Interests--2,4,6,14,15,16,17,18,19,20,21

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Mr. John F. Burger
System Development Corporation
2500 Colorado Avenue
Santa Monica, California 90406

Phone--213:393-9411, ext. 7097

John Burger has been working with, or involved in, natural language processing for the past ten years. Currently, as Principal Investigator for the Conceptual Processing R&D project, he is designing a semantically-oriented processor for translating English queries and commands into data management system operations. The natural-language parser for this system is a unique design of his own which is controlled by "conceptual abstractions" of the target data management system, rather than by formal rules of English syntax. From September, 1968, to November, 1972, Mr. Burger worked with Dr. Charles Kellogg on the design and implementation of CONVERSE, a natural-language data management system that includes a large conceptual network. From April, 1965, he worked with Dr. Robert F. Simmons, performing the major portion of the programming for the second and third versions of Protosynthex -- a program written in LISP and aimed at synthesizing complex language behavior on computers. In addition, he was the designer of a program in LISP 1.5 that refereed Kriegspiel, and he presented a paper describing this program at the ACM 1967 National Conference.

Interests--1,2,4,6,11,20,21

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Dr. Richard Burton
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

(no response received)

****

Dr. Alan Campbell
Institute of Neurology
Queens Square
London W.C. 1, England

(no response received)

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Prof. Wallace L. Chafe
Department of Linguistics
University of California
Berkeley, California 94720

Phone--415:642-2757

Speech production: specifically, simulation of the processes by which underlying mental representations (whatever they consist of) are converted into surface linguistic output. Emphasis on the need to allow for analogic forms of mental representation, and on the role of creative choices by the verbalizer. Such choices are seen to involve especially the breakdown of larger holistic conceptual units into smaller units, and the appropriate categorization of these smaller units. Interested also in the simulation of translation, from the point of view that it consists of (1) recovering the verbalization processes which produced the source language text and (2) the creation of a corresponding verbalization in the target language, based on corresponding creative choices.

Interests--1,11,12,13,speech production

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Dr. Eugene Charniak
Istituto per gli Studi
Semantici e Cognitivi
17 Rue Candolle
1200 Geneva, Switzerland

Phone--091:52 28 51

It is commonly accepted that a computer which answers questions about a natural language text must have roughly a human reader's knowledge of the subject matter. For simple stories (like children's stories) the knowledge needed is that "common sense" knowledge which all members of our culture share. My primary interests are: What is this knowledge? How is it to be represented? How is it to be organized? How is it to be used in the process of understanding text?

Some subtopics of those questions: How is this knowledge used in structural word sense, and referential disambiguation? Should the program make inferences while reading the text, or only when asked a question? Assuming the former, since in principle one can make an infinite number of inferences from a given text sentence, which ones should the program make? Does the narrative or conversational form give clues on this last point? What predicates are needed to express common sense knowledge? What is the role of "primitive" predicates? Can our knowledge be expressed procedurally? Are there other ways to guide fast selection and hence avoid the inferential combinatorial

explosion? How can one give common sense knowledge precisely rather than ad hoc formulation?

Interests--2,4,6,11,12,13,15,17,20,21

****

Dr. Daniel Chester
Department of Mathematics RLM 8-100
The University of Texas at Austin
Austin, Texas 78712

Phone--512:471-4137

My major interests are in text understanding and generation. My long range goal is to make a system for answering essay questions. At present I am working on a program for translating formal proofs into English expositions resembling the informal proofs published by mathematicians and logicians, and a theorem-prover that can generate proofs suitable for such translation. In support of the above I am also interested in discourse analysis, particularly in the structure of discourse not comparable to proofs, and problem-solving when the problem is related to language, either formal or natural.

Interests--2,11,14,15,16,17,18,20,22

****

Mr. Philip R. Cohen
Department of Computer Science
University of Toronto
Toronto, Ontario M5S 1A7
Canada

Phone--416:928-6027

My current research interests involve the representation of knowledge, language comprehension and dialogue capabilities of TORUS, a natural language understanding system being developed at the University of Toronto. My future research interests, towards a Ph.D., will center around extensions of our world-modeling capabilities which are directly linked to expectation, discourse analysis, a study of purpose and motivation, and comprehension. This will encompass the addition of "larger" structures to traditional semantic networks, i.e., structures which encompass more than just a single action at an instant of time. Finally, I am interested in developing active networks to represent world knowledge and system procedures. These networks could be activated or examined, thus providing a possible basis for system introspection.

Interests--1,2,4,6,11,13,15,17,20

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Dr. Kenneth Mark Colby
Department of Psychiatry
University of California
760 Westwood Plaza
Los Angeles, California 90024

Phone--213:825-5091

I am interested in the computer simulation of pathological thought processes. To test such simulations, the model must have the ability to understand natural language. In our simulation of the paranoid mode we have thousands of pattern-matching rules which permit the model to carry out in real-time a dialogue typical of a psychiatric interview

Interests--4,7,15,20,21

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Dr. L. Stephen Coles
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 4601

My major research interests are as follows:

1. Philosophical Problems of Artificial Intelligence, including the classical metaphysical problem known as the "mind-body problem," i.e., an understanding of the relation between the mental world of intellect and the physical world of objects, especially including language as the mediator between these two worlds.

2. Robotics, especially including how the design of a natural language system for a robot possessing an internal model of the real world will function as an organon to shed light on the first area. Motivational systems are very important in this concept, for they provide the teleological basis for a concept of "self."

3. Man-Machine Communication Processes, such as in the context of question-answering and information-retrieval systems, especially including speech and interactive document-preparation aids, such as automatic spelling, punctuation, and grammar correction.

4. Inferential Mechanisms, such as are used in planning, problem-solving, and navigation (both inductive and deductive forms).

Interests--1,2,3,4,6,7,8,9,11,14,15,16,17,18,20,21

****

Dr. Allen M. Collins
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Phone--617:491-1850, ext. 377

I have been working on a project to develop tutorial CAI systems for teaching different types of knowledge; in particular, factual knowledge about geography visual knowledge about maps, procedural knowledge about programming, and causal knowledge about climate. The systems are designed to carry on a tutorial discussion with students by asking and answering questions in English, presenting new material, and making various inferences like a human tutor.

Our approach is to study how human tutors adapt their teaching to particular students by studying actual human dialogues. We also have been studying how people infer answers to various kinds of questions and how they hedge their answers when they are uncertain. Based on our dialogue analysis, we build the human strategies we find into the computer systems we are developing.

Interests--2,4,5,11,13,15,18,20,21

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Dr. Alain Colmerauer
Groupe Intelligence Artificielle
UER de Luminy
70 Route Leon Lachamp
13288 Marseille Cedex 2
France

(no response received)

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Dr. Fred J. Damerau
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-2214

Primarily interested in natural language processing by computer, for purposes of information storage and retrieval. This includes present activity, which is research on English question answering systems. It is apparent that deductive and inductive inference systems are required to cope with a number of the potential applications, and consequently I am also interested in theorem proving and inductive inference programs.

Interests--2,6,15,17,18,19,20

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Dr. D. Julian M. Davies
Department of Computer Science
University of Western Ontario
London, Ontario
Canada

Phone--519:679-6048

My research interests in AI have recently been in the field of language processing, but I will probably be more active in the vision field during the next year or two. However, I hope to maintain my interest in natural language/AI research.

My primary interest in this area is in building a computer program which will maintain a conversation with a human in Natural Language, particularly how to represent the meanings of statements where the program has to update its "belief system". Work so far has used a Planner-like language; POPLER 1.5. Only a "small" program has been written; it will accept statements including negations and logical connectives even when it has to change stored information in consequence. It will also answer questions about its (mundane) subject matter.

I am interested in extending this system to cope with sentences involving cardinal numbers "Three people were killed on the roads today," and words such as "few, many, most, probably," etc., which are indefinite in meaning.

Interests--none indicated

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Ms. Barbara Gross Deutsch
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 4839

My major research interests are in the area of discourse understanding. I am investigating how the conversational and situational contexts in which an utterance is made effect its meaning and how this information can be incorporated in a speech understanding system. The discourses I am analyzing are task-oriented dialogs; i.e., dialogs between two people who must work together to complete some task. In these dialogs there is a close correspondence between a plan for the task and the dialog. Thus, a model of the task is an important source of knowledge for language understanding. I am working on representations for a discourse history and procedures for using both this history and a task representation to resolve references and understand ellipsis (partial utterances).

I am also interested in the user model component of a language understanding system. I am analyzing the task-oriented dialogs to see what signals to a user's competence and understanding are in the dialog. I am also investigating how different user's abilities, goals, and current state can be represented and how the user model interacts with other components of a language understanding system.

Interests--3,6,10,11,13,20,21

****

Dr. Timothy C. Diller
UNIVAC
Mail Station U0P16
P.O. Box 3525
St. Paul, Minnesota 55165

Phone--612:456-2447

My interests in computer understanding of English include the design of modules utilizing syntactic, semantic and pragmatic information (in both teletype and vocal input), and the investigation of phonetic characteristics of segments, and the collection, processing and integration of prosodic sources of information (in vocal input).

With regard to the processing of language data, I am interested in making available in machine-readable form a broad range of data relevant to the semantics of English words. These include formal observations by linguistics, philosophers and computer scientists and data sets approximating semantic fields computationally derived from dictionaries.

Interests--2,3,4,10,11,13,19,20,21

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Mr. George S. Dunham
Computer Research and Technology
National Institutes of Health
Bethesda, Maryland 20014

Phone--301:496-6119

Formal representations of medical semantics and pragmatics which should parallel the inference capacities apparently used by human interpreters of medical language.

Logics for modeling learning processes and development of intelligences in a sequence of pragmatic contexts.

The nature of the integration of the syntax of natural language with its communicative and information bearing roles of constructing working models in the medical language domain.

Design and implementation of computational tools for experimentation in these areas.

Interests--2,11,16,theory of learning

****

Mr. Horace Enea
Computer Science Department
Stanford University
Stanford, California 94305

Phone--415:497-3309

1. Unrestricted dialogue handling
2. Large dictionary construction
3. Thesaurus construction
4. Adequate semantic and syntactic models
5. Understanding in breadth of unrestricted human dialogues.

Interests--1,4,6,7,11,13,15,19,20,21,22

****

Mr. Martin Epstein
Office of Medical Information
Systems, Room A-16
University of California
San Francisco, California 94143

Phone--415:666-2951

Current research interests focus on the role of language in the communication of medical information among medical specialists and the representation of medical information in a form suitable

for computer processing The research would draw from disciplines of computer science, linguistics, and artificial intelligence formal methods for representing and processing medical knowledge. The capability to describe formally and thus structure certain types of medical information might provide a basis for a better understanding of medical knowledge and for the design of effective computer-based question-answering systems.

A specific and well defined subset of medical knowledge will be selected with a view towards gaining an understanding of this domain of discourse. In a limited area of medicine it should be possible to ask questions of a data base, to explain why a particular response is given, and to provide for the acquisition of new knowledge.

Interests--2,3,4 11,12,15,21

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Dr. Lee D. Erman
Department of Computer Science
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Phone--412:621-2600, ext. 146

My major efforts are in the design and construction of speech understanding systems, with emphasis on system organization. The basic orientation is the use of multiple sources of knowledge at all levels (e.g., semantics, syntax, lexicon, phonology, acoustic-phonetics) cooperating through a common dynamic data structure (called "blackboard"). Knowledge sources are assumed to be errorful and incomplete; a major problem is to efficiently utilize the best aspects of each to correct the mistakes of others.

Interests--1,3

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Dr. Arthur Farley
Department of Computer Science
University of Oregon
Eugene, Oregon 97403

Phone--503:686-4428

My research interest focuses in two related fuzzy areas:

1. The analysis of protocols and the construction of production systems to model the observed behavior.

2. Conducting experiments to understand the processing of visual infbrmation by humans (picture perception, the perception of letter aequences in and out of context, to discern the point of word perxeption).

The intent of all research that I have in mind or that is becoming reality is to investigate the nature of human cognitive activity.

Interests--7,10,18

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Prof. Nicholas V. Findler
Department of Computer Science
SUNY Buffalo
4226 Ridge Lea Road
Amherst, New York 14226

Phone--716:831-1351

There are about a dozen different, on-going projects in Artificial Intelligence in which my students and I are engaged. The following are descriptive project titles;

1. Automatic Solution of Crossword Puzzles within an Associative Memory Environment;
2. A Simulation Study of the Behavior of Several Robots Which Can Learn, Plan Their Actions and Co-Exist;
3. A Teachable Problem Solver That Reasons by Analogy;
4. A Self-Repairing Programming System;
5. Studies on Decision Making under Uncertainty and Risk;
6. Towards Computer Lexicometry;
7. Heuristic Search Processes in Associative Networks;
8. An Inferential Retrieval System for Noisefree and Noisy Diagrams;
9. Automatic Solution of Word Puzzles;
10. On the Optimal Solution of Cryptarithmetic Puzzles;
11. An Approach to the Automatic Evaluation of the Subjects' Verbal Behavior in Roemer's Inkblot Test;
12. A Computerized Matchmaker That is Capable of Learning;
13. On the Problems of Time, Retrieval of Temporal Relations, Causality and Co-Existence;
14. An On-Line Query System for Kinship Structures.

Several of the above projects make use of an interactive man-machine environment which consists of a graphics computer, and IDIIOM I with a Varian 620/i mini-computer, connected to the university's central machine, a CDC 6400.

Interests--1,2,4,5,6,7,8,9,14,15,16,17,18,19,20,21,22

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Mr. Dick H. Fredericksen
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-2455

Fact retrieval from programming and computer manuals, in response to questions, topic names, and requests in unrestricted natural language.

Interests--2,4,19,20,21,recognition of synonymous utterances

****

Dr. Carl H. Frederiksen
Office of Research
National Institute of Education
Brown Building
Washington, DC 20208

Phone--202:254-5766

My current research program is concerned with discourse comprehension, semantic memory, and discourse processing. In particular, we have been developing a network model of logical and semantic structures from which speakers or writers generate linguistic messages at the discourse level. The purpose in developing such a model is to provide a basis for studying effects of structural properties of discourse on processes by which khowledge is acquired from discourse, to provide a model of the format by which acquired information is represented in memory, and to provide a data structure which can be employed in assessing semantic information which is acquired when a text is "understood". The network model is being employed in a series of experiments which study effects of structural properties of texts on the semantic information which subjects' acquire when they understand a text. The long-term objective of the research is to determine the form in which semantic information is represented in memory, and to specify the processes by which such knowledge is acquired, stored, retrieved, and linguistically expressed.

Interests--2,4,10,11,12,15,16,20

****

Prof. Joyce Friedman
Computer Communication Sciences
2076 Frieze Building
University of Michigan

Ann Arbor, Michigan 48104

Phone--313:764-8504

1. Decision procedures for solvable cases of the first order predicate calculus; computer programs for such procedures.

2. Transformational grammars: analysis procedures; generation procedures following Chomsky's Aspects model; extensions of the model to phonological rules.

3. Modal logics and linguistics: computer investigations of Montague's treatment of a fragment of English. Results include generation and parsing routines; studies of the translation to modal logic are in progress.

4. Speech understanding systems: systems aspects of the model; how the various sources of knowledge interact.

Interests--1,3,16,17,19

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Dr. Teiji Furugori
Computer Science
Cleveland State University
Cleveland, Ohio 44110

(no response received)

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Mr. Donald R. Gentner
Department of Psychology
University of California, San Diego
La Jolla, California 92037

Phone--714:452-2997

I am studying the basic processes which underlie the learning of complex material such as history and computer programming. This work is based on a semantic network theory of human memory. I use computer implementations of psychological models as a source for ideas and a test of performance of theories.

I am also interested in building systems which can understand material from natural definitions such as might be found in a textbook.

Interests--2,5,10,11,12

****

Dr. Joseph Goguen
Computer Science
3532 Boelter Hall
University of California
Los Angeles, California 90024

Phone--213:825-2422

Inexact problem-solving, especially natural language understanding and applications to inexactly specified domains; e.g., hints for running a maze. Using fuzzy sets, fuzzy logic. Inexact semantics; pragmatics.

Interests--none indicated

****

Dr. Neil M. Goldman
USC Information Sciences
Institute
4676 Admiralty Way
Marina del Rey, California 90291

Phone--213:822-1511

1. Knowledge representation and organization
   a. Conceptual (language-independent) representations of information
   b. Sharing of knowledge and inference rules among concepts
   c. Integration of new information in a conceptual information base

2. Search strategies for retrieval of conceptually encoded information; recognition of "paraphrase" -- retrieval of stored information from partial content specification.

3. Generation of natural language for conceptual representations of information
   a. Word selection heuristics
   b. Surface structure determination
   c. Pragmatic issues in generation for man-machine dialogues

4. Use of natural language for algorithm specification in Automatic Programming

5. "Natural inference" -- probabilistic and context-sensitive inference on narrative text.

Interests--1,6,12,15,20,21

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Dr. Ira Goldstein
MIT AI Laboratory
545 Technology Square
Cambridge, Massachusetts 02139

(no response received)

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Dr. Ralph Grishman
Courant Institute
New YorK University
251 Mercer Street
New York, New York 10012

Phone--212:460-7492

I am interested in systems capable of accepting scientific or technical data in natural language and of structuring the information received, either for subsequent retrieval (as in information retrieval systems with a natural language data base) or for translation into some formal notation (as in "automatic programming"). I am currently pursuing research in three areas:

1. Automatic syntactic analysis: development of a system for the automatic transformational decomposition of English sentences into trees of kernel sentences.

2. Sublanguage analysis: investigation of language usage in very specialized scientific and technical fields. Study of the word classes specific to the sublanguage and of the patterns of word classes used in sublanguage sentences. Procedures for obtaining these classes and patterns automatically from distributional data on syntactically analyzed sublanguage texts.

3. Semantic analysis: exploration of the types of rules required to reduce discourse concerning some very restricted technical subject matter to a formal notation (e.g., the translation of descriptions of programming language constructs into BNF).

Interests--4,11,19,20

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Mr. Louis Gross
MIT Lincoln Laboratory
P.O. Box 73
Lexington, Massachusetts 02173

Phone--617:862-5500, ext. 5380

My most recent project was a graphics-oriented implementation of the General Syntax Processor (GSP), based on Ronald Kaplan's GSP. GSP is a model of a parsing machine, and it has as special cases several different parsing schemes (such as Woods ATN and Kay's chart parser). GSP makes explicit the control mechanisms implicit in particular schemes and allows exploration of alternatives. This explicit control mechanism allows the exploration of parallel processing.

My implementation uses interactive graphics to display the parse chart and active processes (indicating which part of the chart is the focus of each process), and allows the user to either use algorithms to influence path selection, or to make that selection directly by means of the tablet.

Interests--1,3,19,20

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Mr. Richard W. Grossman
MIT, NE43-825
Cambridge, Massachusetts 02139

Phone--617:253-5848

The representation problem, especially regarding semantic and pragmatic representations for natural-language understanding.

I desire a representation in which "intuitively simple" inferences can be made in a computationally simple manner, and which is capable of supporting more complex inferences (at a correspondingly greater computational cost). The key point is that the computa ional features of such a representation deserve as much attention as the abstract logical ones.

Interests--2,4,6,15,17,20,21

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Ms. Carole D. Hafner
2028 Mental Health Research
Institute
University of Michigan
Ann Arbor, Michigan 48104

Phone--313:764-4220

Semantic models of legal knowledge
Use of semantic models for organizing and accessing large data bases

Interests--1,2,3,6,11,20,21

****

Prof. Larry R. Harris
Mathematics
Dartmouth College
Hanover, New Hampshire 03755

Phone--603:646-2672

Developing natural language understanding systems for restricted, but real life areas of application.

Interests--1,2,4,19,20,22

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Dr. Patrick Hayes
Computing Centre
Essex University
Colchester, Essex, UK

Phone--0206:5630, ext. 2371

I am interested basically in how thinking is organised, especially 'deductive' reasoning in the broadest sense. This includes areas traditionally called 'robot planning', and also more recently the sorts of concern which Charniak, Schank, and Rieger are engaged with. My background in logic and theorem proving encourages a fairly formalist position, but I am also concerned to reconcile, as far as possible, apparently conflicting methodologies (e.g., deductive and analogical reasoning modes). My recent interests include a continuing effort to axiomatise 'general' common sense knowledge about the physical world (part/whole relationships, causality, time, space and shape, simple mechanisms, properties of liquids); and an investigation (just beginning) of the structure of conversations, especially with regard to role-playing.

Interests--2,4,6,8,13,14,15,16,17,18

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Mr. Philip J. Hayes
Computer Science
University of Rochester
Rochester, New York 14627

Phone--091:52 28 51

When, in reading a story or other connected passage, we encounter a word with a number of different meanings, we usually unhesitatingly choose one of those meanings as the one the author intended. This ability is, I believe, explainable in

terms of a whole range of interacting influences from simple syntactic constraints, through semantic restrictions, to deep and complicated inferences based on general world knowledge. I am interested in designing and implementing on a computer processes which simulate (at least some of) these influences and the interactions between them.

My broader interests lie in simulating human understanding in general, but I have chosen disambiguation as a reasonably well-defined sub-problem through which many of the fundamental problems in more general understanding can be addressed.

Before becoming interested in natural language research, I worked at the University of Edinburgh on the construction and execution of robot plans. In particular, I was interested in methods of reconstructing a plan so that it could still achieve its original goal after it had failed in execution.

Interests--1,4,6,8,9,11,12,15,19,20,21

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Dr. Frederick Hayes-Roth
Department of Computer Science
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Phone--412:621-2600, ext.136

1. Knowledge Engineering: The representation of knowledge as relational data structures which are specially well adapted to (a) recognition of structured patterns, e.g., recognizing the occurrence of a particular semantic structure; (b) concept (pattern) and grammatical (rule) learning; (c) the construction of large-scale systems whose processing elements are independent productions (variable contingency response rules).

2. Learning: General procedures for abstracting (productions) rules of behavior from examples (e.g., learning the rules of transformational grammar from examples) as well as evaluating the performance (validity, utility) of alternative rules.

3. Syntax & Semantics: The representition of the knowledge required for human language and speech processing and procedures for induction of such representations.

4. Pragmatics in Understanding (especially Speech): Efficient procedures for parallel searches, focus of attention, and scheduling of computation in human intelligent behavior and in the Multiprocessor Carnegie-Mellon Speech Understanding System.

5. Adaptive Memory: Mechanisms for modulating preferability of alternative behavior rules as a result of behavior-contingent

feedback (reinforcement experience).

Interests--1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22

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Dr, David G. Hays
Twin Willows
Wanakah, New York 14074

Department of Linguistics
State University of New York, Buffalo

Phone--716:627-5571; 636-2177

A theory of cognitive networks and processes on them. The structure of the system is influenced by consideration of both human psychology and computation. Paradigmatic structure facilitates addressing elements in the network; syntagmatic structure represents the participation of entities in events modality structure manages flow of control and organizes history into episodes; recursive metalingual structure provides for abstraction. Processes are grossly classified as path tracing and pattern matching. The power of the network theory is in th possibility of inference by path tracing, inherently less costly than pattern matching.

Work on the theory is guided and stimulated by applications for which students are responsible: extension of the span of control in robotics (T. Furugori); crosscultural communication (M. White); coherence of discourse (B. Phillips); plot structure (R. Reese); poetic structure (W. Benzon). The theory has also been applied tentatively to problems of information organization and retrieval in medicine and to conceptual analysis in sociology.

Interests--4,7,8,11,19,20,21

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Dr. George E. Heidorn
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-2776

In general, I am interested in making it possible for people with no special computer training to be able to use the computer by telling it what they want in their own natural language. In my earlier work I developed a system which would automatically produce a GPSS simulation program for a simple queueing problem after engaging a user in an English conversation about his problem. Currently we are applying the same techniques to develop a system which will automatically generate a business application program after carrying on a natural language

dialogue with a businessman about his requirements.

Interests--1,2,4,13,19,20,21

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Dr. Gary G. Hendrix
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415;326-6700, ext. 4664

The major research interest of this worker is in exploring and developing deep representations of semantic information for natural language applications. Representations for both static and dynamic knowledge are of interest with recent research centering around expanding the power of semantic networks to take advantage of the notions of world modeling and planning. Semantic considerations for translating from surface structures (especially speech) into deep representations also receive attention in current work.

Other research areas include the use of net structures in question answering and the development of special techniques for modeling parallel and continuous processes.

Interests--1,2,3,6,20

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Dr. Annette Herskovits
AI Laboratory
Stanford University
Stanford, California 94305

(no response received)

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Dr. Jerry R. Hobbs
356 Starling Rd.
Englewood, New Jersey 07631

Department of Computer Science
City College, City University
of New York

Phone--201;567-8853

212;621-2631

1. Have outlined a fairly general model for natural language semantics. Now trying to deepen this model with respect to:

    a. analysis of comparatives,
    b. lexical decomposition and discourse analysis,
    c. meanings of principal terminology of space-time.

Plan in near future to develop a system, utilizing item c, which translates directions in English into maps.

2. Developing the transformational component for Naomi Sager at Linguistic String Project, N.Y.U. This translates parse trees into a representation close to that required by the semantic model.

Interests--1,4,6,7,11,19,20

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Mr. Stephen Isard
Centie for Research on Perception
and Cognition
University of Sussex
Brighton BN1 9QY, England

Phone--none listed

World modeling, conversational analysis, syntax, semantics, pragmatics

Interests--6,13,19,20,21

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Dr. Dale W. Isner
Computer Center
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Phone--412:624-6355

Major research interest concerns the development and implementation of inferential processes and procedures for machine comprehension of natural language. In conjunction, I also have interests in world modeling including the machine representation of general knowledge. Related interests include development of techniques for applications in the areas of question-answering systems and computer-aided-instruction.

Interests--2,4,5,6,11,13,14,15,16,17,18,19,20,21

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Mr. Martin Janta-Polczynski
(see entry for Pirotte)

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Prof. Sara R. Jordan
Computer Science Department

University of Tennessee
Knoxville, Tennessee 37916

Phone--615:974-5067

I am currently interested in the following areas:

1. Language understanding, semantic memory

2. Generation of natural language from internal representations. Specifically in medical computing, generation of English output from encoded structures

3. Information storage and retrieval

Interests--4,20,22

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Prof. Aravind K. Joshi
Computer and Information Science
R. 371, Moore School
University of Pennsylvania
Philadelphia, Pennsylvania 19174

Phone--215:243-8540

Language understanding systems, computational linguistics, syntactic and semantic representations for language structure, relationship of language structure to logic, theory of computation especially as it relates to linguistics, language processing, and AI in general.

Natural language descriptions of scenes, natural language interface for scene analysis.

Development of interdisciplinary educational programs in natural language processing.

Interests--1,2,4,6,7,11,12,13,15,16,19,20,21,
natural language interface for scene analysis

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Dr. Ronald M. Kaplan
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304

Phone--415:493-1600

I am primarily interested in devising computational models of human language comprehension. My research lies at the

intersection of psychology, linguistics, and computer science/artificial intelligence. I have conducted psychological experiments on the language understanding process, constructed recognition grammars for English, and explored some of the fundamental issues in the design of language analysis programs. My recent work has been aimed at a synthesis of these different approaches to human language performance.

I am currently a member of the Understander Group at Xerox PARC, whose long-term goal is to build a theoretically interesting computer model of language understanding. This model will deal with the syntax, semantics, and pragmatics of human communication in a few limited domains of discourse.

Interests--1,2,3,4,6,7,8,13,19,20,21

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Ms. Peggy M. Karp
AI Laboratory
Stanford University
Stanford, California 94305

Phone--415:497-4971

My research is in the area of computer understanding of dialogs. While interested in formulating a general theory of discourse, the domain is currently restricted to the conversations that occur during bargaining sessions in the game of Diplomacy. A system is being developed that can read Diplomacy dialogs, understand them, and discuss them with a human. This work is directed by Terry Winograd, Stanford AI Laboratory.

A set of dialogs has been collected and analyzed, providing the basis for the development of knowledge representations, conversational strategies, and reasoning mechanisms. Within Diplomacy, knowledge of game rules and strategies, bargaining structures and tactics, player models, and the state of the game and the bargain define our "world." This information, coupled with discourse knowledge (i.e., a "structure of conversations"), determines the context in which an utterance occurs. We are developing procedures for operating on this knowledge such that given an utterance, we know what assumptions are reasonable and what inferences can be made to fill in information that is not explicit. The system can then determine the speaker's intention and represent the meaning of the utterance. The system will be implemented using a Knowledge Representation Language being designed by Terry Winograd and Danny Bobrow of Xerox PARC.

Interests--4,6,7,10,11,13,15,20,21

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Mr. Martin Kay
Xerox PARC
3333 Coyote Hill Road
Palo Alto, California 94304

(no response received)

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Dr. Charles Kellogg
System Development Corporation
2500 Colorado Avenue
Santa Monica, California 90406

Phone--213:393-9411

Major interest and research efforts are focused on natural language processing and deductive inference for on-line question answering and fact retrieval. This includes the areas of parsing algorithms for providing both surface syntactic structures and case-oriented deep structures, design of intermediate languages for realizing procedural semantics, relational data base systems, concept networks, morphological and anaphoric analysis, spelling error detection and correction heuristics, development of practical techniques for achieving deductive question answering, display of evidence chains in user oriented form, and construction, evaluation and execution of inferential plans.

Interests--2,6,8,9,11,15,17,19,20,21

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Dr. Maija Kibens
Mental Health Research Institute
The University of Michigan
205 Washtenaw Place
Ann Arbor, Michigan 48104

Phone--313:764-4227

I am interested in theories of language learning, processes of understanding non-standard utterances such as metaphor and neologisms, semantic representation, and extensions of the generative theories of language as a basis for understanding language processing.

Interests--2,4,11,13,20,21,22

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Prof. Sheldon Klein
Computer Sciences Department

University of Wisconsin
1210 W. Dayton Street
Madison, Wisconsin 53706

Phone--608:262-1204

In one combined system: compiler driven behavioral simulation language; automatic generative semantic grammatical inference; automatic presuppositional analysis; computer models for the linguistic basis for the inference of non-linguistic sociocultural behavior. Representation of verbal and non-verbal semantics in semantic network notation in conjunction with above. Automated Text grammar systems modeling of complex behavioral scenarios with models with power of higher order predicate calculus; natural language meta-compiling, including generative models in folklore (Propp and Levi-Strauss).

With reference to above: testing of psychological models and theories of human behavior and cognition. Testing linguistic theories and models in problem areas, including Pidgin and Creole ontogeny, and including complex models of semantic parsing.

Interests--1,3,4,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21,22

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Mr. John William Klovstad
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Phone--617:491-1850

My experience and contributions thus far have been concentrated primarily in the following three areas of Speech Perception:

1. Word perception (excluding the acoustic processing)
2. Application of syntactic and semantic constraints
3. Control strategy

I have been especially concerned with the development of efficient techniques by which philosophies in these (and other areas of interest) can be implemented, hopefully without sacrificing generality. E.g., one such technique permits the efficient consideration of all applicable word boundary effects, where each effect is described by a single phonological word boundary rule.

My present work deals with word perception (lexical retrieval) and control strategy.

I also have acquired an interest in machine translation, particularly in the precise internal representation and subsequent expression of a concept.

Interests--1,3,4,6,7,15,17,18,19,20,21,22

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Prof. Manfred Kochen
Mental Health Research Institute
University of Michigan
Ann Arbor, Michigan 48104

Phone--313:764-2585

1. Proving, by construction of computer programs, the existence of an algorithm that *forms and *uses *representations of *environment so that it can *recognize and *cope with an increasing *variety of *opportunities and *traps. Explication of concepts denoted by asterisked terms.

2. Developing a research tool to help develop a mathematical theory of cognitive learning.

3. Extend, test and apply operational computer programs for action-selection based on hypotheses to training of medical students, helping health-systems planners, analyzing the structure of what is known in a field for gaps, contradictions.

4. Modeling of and experimentation with question-asking processes in ill-structured problem-situations.

5. Connecting work on the representation problem with innovations in educational practice (e.g., an experimental "course" on mathematics "teaching") and a study of the organization of knowledge for wise policy- and decision-making.

Interests--2,4,5,6,7,8,9,14,15,18,20,21

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Prof. Elliot B. Koffman
Computer and Information Sciences Department
School of Business Administration
Temple University
Philadelphia, Pennsylvania 19122

Phone--215:787-1912

The application of semantic networks to computer-aided instruction is being investigated. The major emphasis to date has been on the design of a student-oriented environment for learning LISP. The design includes a LISP interpreter with an

extended error-handling capability for evaluating functions written by students. Students can ask questions in natural language about LISP in general and concerning specific LISP functions which they have defined. A fuzzy parser interprets the student requests and builds a LISP function which operates on a semantic network to determine its response.

A second effort has focused on the study of a general model for problem generation and solution. This model incorporates heuristics which corresponds in a dual manner to Polya-type heuristics for problem solution. The model studies the possible structure a problem can have in terms of operations on basic problems and the relationship of this structure to that of the solution to the problem. Future efforts will consider interfacing this general model with a semantic network in order to express the generated problem in natural language form.

Interests--1,2,5,14,20

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Mr. Rand B. Krumland
MIT/Project MAC
545 Technology Square
Cambridge, Massachusetts 02139

Phone--617!253-3510

Am interested in system building and world modeling in a few application areas, the major one being interactive support for managers in organizations. Managers often could benefit by having access to various kinds of expertise for a broad range of decision-making and problem-solving tasks. Am interested in investigating such expertise and in attempting to begin to supply it by building systems to answer questions, to aid in management science model building, and to aid in programming such models. This, of course, involves a broad range of theoretical and practical issues associated with representing knowledge, building knowledge bases, and interpreting and utilizing such knowledge. Am interested generally in other application areas in which the problems could be characterized as those of delivering expertise.

Interests--1,2,6,8,9,20

****

Mr. John L. Kuhns
Operating Systems, Inc.
18345 Ventura Boulevard
Tarzana, California 91356

(no response received)

****

Mr. Michel Lacroix
(see entry for Pirotte)

****

Dr. S. P. J. Landsbergen
Artificial Intelligence Group
Philips Research Laboratories WB3
Eindhoven, The Netherlands

Phone--040:74 33 65

1. Formal aspects of the semantics of natural language.
2. Integration of syntax and formal semantics.
3. Question answering systems.

Interests--1,2,6,7,11,13,15,16,17,18,19,20,22

****

Dr. Rick LeFaivre
Computer Science Department
Hill Center, Busch Campus
Rutgers University
New Brunswick, New Jersey 08903

Phone--201:932-2898

My major concern is with techniques for representing and manipulating "fuzzy" knowledge -- knowledge which is vague, imprecise, ambiguous, or probabilistic in nature. Natural language admits a wide variety of techniques for communicating fuzzy concepts -- my goal is to formalize some of these techniques and investigate their application to artificial intelligence. The first step in this direction is FUZZY, a many-valued AI language currently running at the University of Wisconsin and soon to be available over the ARPA net.

Interests--1,6,7,8,9,14,15,16,17,18

****

Dr. James Levin
USC Information Sciences Institute
4676 Admiralty Way
Marina Del Rey, California 90291

Phone--213:822-1511

Comprehension of text input. Representation and processing of semantics and pragmatics. Role of inference and problem solving in comprehension and production of language. Analysis of task-oriented dialogs.

Interests--2,4,5,13,15,20,21

****

Prof. Robert K. Lindsay
University of Michigan
205 Washtenaw Place
Ann Arbor, Michigan 48104

Phone--313:764-4227

I am interested in the general problem of linguistic communication in all of its aspects, including but not limited to the following: the nature and limitations of intelligence, natural and artificial; the processing of linguistic utterances and the handling of all aspects of their interpretation and production; the relation of linguistic to non-linguistic knowledge; the acquisition of linguistic abilities; processes of inference, including induction, pattern recognition, memory, and problem solving. My interests are more philosophical and theoretical than applied.

Interests--2,4,6,14,15,18,19,20,21,22

****

Prof. H. C. Longuet-Higgins
Centre for Research on Perception
and Cognition
University of Sussex
Brighton BN1 9QG, England

Phone--027:36 67 55

Formalising the semantics of natural language.

Interests--none indicated

****

Mr. Clinton Prentiss Mah
MIT, Project MAC, NE43-419
Cambridge, Massachusetts 02139

Phone--617:253-2897

I am interested in defining the role of linguistic context in the interpretation of sentences in discourse. The treatment of

context in natural language systems has usually been no more than an afterthought, more often than not just an artifact of one's programming system. In order to understand texts, however, we need a comprehensive model of how context works: what linguistic features are associated with context, how parsing strategies can make use of contextually defined constraints, and how data bases can be constructed to represent context. I am looking into these questions with a mind to developing a new sort of discourse analysis.

Interests--2,11,12,13,20,21

********** **********

Dr. Ashok Malhotra
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-2914

My major area of interest is automatic programming in the sense of making it easier for humans to use computers. This can be done in three ways: by allowing them to specify requests for information in natural language, by allowing them to specify application systems in natural language, and by allowing them to customize applications in natural language. Each of these paths requires the ability to carry on a conversation in natural language with the user in an effort to understand what he has in his mind. Such a conversation is possible only if we have a better idea of how the user stores and manipulates information and uses new information with his existing models of the world for problem-solving, decision-making, and coming to grips with situations.

Interests--2,4,6,7,9,11,13,14,20

****

Dr. William C. Mann
USC Information Sciences
Institute
4676 Admiralty Way
Marina del Rey, California 90291

Phone--213:822-1511

I am currently engaged in research on process models of successful human dialogue. It is an interdisciplinary team effort involving psychology, linguistics, computer science and, to a lesser extent, ordinary-language philosophy and other fields.

Interests--6,7,10,13

****

Mr. Richard S. Marcus
MIT, ESL, Room 35-406
Cambridge, Massachusetts 02139

Phone--617:253-2340

Current Work: Development of computer-assisted systems for semantic representation of natural language text so as to facilitate functions such as information transfer, question answering, logic and redundancy checking. Development of theory of semantic representation emphasizing ambiguity resolution and based on interactive establishment of sense and reference using pointers to standard reference works and textual data.

Previous Work: Morphological and syntactical analysis of natural languages for use in applications such as information retrieval, stenotypy transcription, and natural language translation.

Interests--1,2,4,12,20

****

Dr. William A. Martin
MIT/Project MAC
545 Technology Square
Cambridge, Massachusetts 02139

Phone--617:253-5893

Design of a programming language based on concepts in the English language. This language is for building interactive problem solving systems based on verbal reasoning.

Interests--1,2,4,5,6,8,9,10,11,12,13,14,19,20,21

****

Dr. Gary R. Martins
Stonehenge Systems Laboratory
15450 Cohasset Street
Van Nuys, California 91406

Phone--213:785-6666

To successfully understand human language behavior, and to embody this understanding in useful computational models, it is first necessary to drastically revise the dominant contemporary approaches to language. Successful grammars, in the future, will be rooted in coherent descriptions of the pragmatic and

semantic phases of language use, with syntactic and phonological processes strongly subordinated to these. The semantic framework of a language transaction is an explicit account of the function-argument relations in the transmitted material, and may conveniently be represented as a self-referring list; this representation covers, in a single structure, anything from exclamations to extended, multiparticipant discourse. Pragmatic pressures are resolved by modifications of this structure, permuting items (e.g., for emphatic purposes) or replacing them (e.g., for efficiency, as in pronominalization), and so on. When an acceptable structure is reached, the syntactic and phonological consequences follow in a straightforward manner. The lexicon is principally indexed by words, which are cross-linked for conceptual relatedness. Each lexical entry carries recipes detailing the semantic, syntactic, and phonological behavior of the word. Abstractions from these recipes, as the lexicon grows, constitute true linguistic generalizations, from which the familiar categories and "rules" of grammar are derived. This view of language explicitly claims validity both as a basis for computational procedures and as a model for human language acquisition and use.

Interests--none indicated

****

Mr. Gerald B. Mathias
East Asian Languages
University of Hawaii
Moore Hall 370
1890 East West Road
Honolulu, Hawaii 96822

Phone--none listed

Developing parsing procedure for standard colloquial Japanese. The goal is to write a context-sensitive algorithm to reduce a transliterated representation of sentences to a universal abstract semantic representation of a sort that can be converted into any given natural language with a semantically based sentence-generating procedure. Although attainment of the goal would obviously result in machine translation, the immediate practical purpose of using the computer is for a quick, unbiased check of the internal consistency of each developmental stage of a model of language comprehension.

Interests--none indicated

****

Prof. John McCarthy
Computer Science Department
Stanford University

Stanford, California 94305

(no response received)

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Mr. George W. McConkie
Department of Education
Cornell University
Ithaca, New York 14853

Phone--607:256-2063

I am interested in the development of an information-processing theory of fluent reading, including perceptual as well as language-processing aspects. Present concerns include the investigation of the size of the region from which various aspects of the visual information are obtained during a fixation, identifying what aspects of the visual pattern are used in reading, specifying the nature of the control over eye movements in reading, discovering the temporal characteristics and sequence of various processes involved in assembling the meaning of the passage, analysis of the semantic structure of a text and relating structural characteristics of the text to what readers tend to remember from the passage.

Interests--4,11,modeling the reading process

****

Mr. Drew Vincent McDermott
MIT AI Laboratory
545 Technology Square, Room 814
Cambridge, Massachusetts 02139

Phone--617:253-5899

I am interested in building general-purpose world models for problem solving and semantic and pragmatic processing of natural language. I am especially interested in the problem of change in such a model as new information and advice are acquired. I have been focussing on predicate calculus as the notation for beliefs in a model.

Interests--2,6,7,8,14,15,16,17,18,20,21

****

Mr. David McDonald
MIT AI Laboratory
545 Technology Square, Rm 824
Cambridge, Massachusetts 02139

Phone--617:253-6032

By background and inclination, my primary interest is natural language. My original work was revising and extending Winograd's SHRDLU program. Presently I am developing the linguistic component of a system for generating, as opposed to understanding, language. The main concern is to examine why various constructs available in language are used -- e.g., what decides between passive and active in a given situation -- and then embedding such information in a program which can translate a representation of a desired utterance given in the internal format of the main program -- say a personal assistant -- into fluent English which properly conveys the main program's intentions.

By extension, I am interested in expert programs in general, programs with rich semantic data bases -- chess, programming assistants, appointment schedulers, etc. How does one coordinate decision making in an environment where a large number of facts may be relevant, and the decision metrics are very poorly understood?

Interests--1,2,3,4,6,8,9,14,19,20

****

Dr. Piet Medema
Artificial Intelligence Group
Philips Research Laboratories, WB3
Eindhoven, The Netherlands.

Phone--04[illegible]74 32 83

Question Answering systems using:

1. written input
2. natural language
3. large data bases

Design of clean, well-structured systems (programs)
Decision problems or decision tree strategies.

Interests--1,2,9,17,18,19,20

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M. Henri Meloni
(See entry for Battani)

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Dr. Perry L. Miller
MIT, 36-575

Cambridge, Massachusetts 02139

Phone--617:253-7309

1. The problem of developing an "adaptive" natural language system which, if confronted with a sentence containing a word or expression it did not understand, could ask intelligently for clarification.

2. The problem of using syntax and semantics to assist in speech recognition.

3. The problem of parsing unrestricted text as fully as possible to provide information useful for incorporating "prosodic" effects into synthesized speech.

Interests--3,15,19,20,21,22

****

Prof. Jack Minker
Department of Computer Science
University of Maryland
College Park, Maryland 20742

Phone--301:454-2001

My major interests in artificial intelligence are in the development of problem solving systems with particular emphasis on Question-Answering (QA) Systems. I have interests in all aspects of QA Systems: natural language input processing, data structures necessary for large QA Systems, problem solvers needed to perform deductive searches, and the output language to be presented to the user.

The main emphasis in my current work is on the problem solver portion of a QA System. Syntactic, semantic (real world knowledge), parallel and interactive techniques are required to effectively direct deductive searches. Work is being conducted in all of these areas. An experimental theorem proving system termed the Maryland Refutation Proof Procedure System is being used as a focal point in the research.

As greater insight is gained into the problem of deductive searches for large QA Systems, attention will be focused on other aspects of QA Systems, and other problem solving areas.

Interests--1,2,4,5,6,7,9,14,15,16,17,19,20

****

Prof. Marvin Minsky
MIT AI Laboratory

545 Technology Square
Cambridge, Massachusetts 02139

(no response received)

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Dr. Kenneth I. Modesitt
Mathematical Sciences
Purdue-Fort Wayne
Fort Wayne, Indiana 46805

Phone--219:482-5380

Natural Language Programming
Question Answering
Extensible Processors

Interests--2,4,20

****

Dr. Christine A. Montgomery
Operating Systems, Inc.
21031 Ventura Boulevard, Suite 1200
Woodland Hills, California 91364

Phone--213:887-4950

Automated understanding of natural language text, which necessarily involves for any complex application syntax, semantics, pragmatics, inductive and deductive logic.

Interests--11,12,13,15,16,17,18,19,20,21

****

Dr. James A. Moore
USC Information Sciences
Institute
4676 Admiralty Way
Marina del Rey, California 90291

Phone--213:822-1511

Representation of knowledge
Production Systems
Semantic Nets
Modeling of Dialog
Man/Machine Interaction

Interests--1,4,6,7,13,14,20

****

Mr. Robert C. Moore
MIT AI Laboratory
545 Technology Square, Room 818
Cambridge, Massachusetts 02139

Phone--617:253-5868

I am most interested in extending procedural deduction systems to be able to represent a wider range of information than previously possible. I am currently working on reasoning from incomplete knowledge, particularly reasoning about change (the "frame problem") from incomplete knowledge. Also, I am working on reasoning about knowledge and belief. I am interested in using this type of system as the reasoning component of natural language understanding systems.

Interests--6,8,14,15,17,20

****

Prof. John A. Moyne
Department of Computer Science
Queen's College, CUNY
Flushing, New York 11367

Phone--212:520-7158

Interested in all aspects of natural languages processing; theories of formal and natural languages and their relationship to automata; syntactic and semantic studies in various natural and artificial languages.

Interests--1,2,5,11,12,13,19,20,22

****

Prof. John Mylopoulos
Computer Science Department
University of Toronto
Toronto, Ontario M5S 1A7
Canada

Phone--416:928-5180

1. Design and implementation of Natural Language Understanding Systems for specific universes of discourse.

2. Representation problem in situations where it may be of use in 1.

3. Programming languages for AI, with an emphasis on features t at may be of use in 1.

Interests--1,4,6,11,19,20,21

****

Dr. Robert Allen Nado
Mental Health Research Institute
University of Michigan
205 North Forest Avenue
Ann Arbor, Michigan 48104

Phone--313:764-4220

Goal-Oriented Problem Solving
Learning
Task Oriented Language Processing
Representation Theory

Interests--4,6,8,14,15,20,21

****

Prof. Makoto Nagao
Electrical Engineering
Kyoto University
Yoshida-Honmachi, Sakyo-ku
Kyoto, Japan

Phone--075-751-2111

We have been engaged in building an intelligent question-answering system and a machine-translation system. We adopted and modified Fillmore's case-grammar to analyze Japanese sentences. A dictionary, which contains about 350 words with detailed semantic descriptions, and a new programming language named PLATON, which accepts string, trees and lists and transforms them in arbitrary ways, have been developed. PLATON is based on the augmented transition network model of W. Woods, and has various additional capabilities of recent AI languages, that is, pattern-matching and flexible back-tracking mechanisms. By using these, we constructed a parsing program to analyze sentences into conceptual representation, which bears some resemblance to Schank's conceptualization. Based on this representation, we are now developing an efficient inference algorithm which utilizes various set-theoretical relationships between concepts.

These programs are written in LISP. A LISP 1.5 interpretive system using a virtual memory concept is implemented on a mini-computer (TOSBAC-40). We are now going to build a new LISP system following the specifications of Stanford LISP 1.6

equipped with a back-tracking facility.

We are also interested in automatic indexing, abstracting, and information retrieval systems which can carry out intelligent conversations with people through natural language.

Interests--2,11,13,14,15,17,18,19,20,21

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Mr. Seiichi Nakagawa
(see entry for Sakai)

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Mr. Kazuo Nakamura
(see entiy for Nagao)

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Ms. Bonnie L. Nash-Webber
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Phone--617:491-1850, ext. 227

I have two major areas of interest: lexical semantics, especially as it interacts with speech understanding, and intelligent SDI systems (Selective Dissemination of Information). My current research involves the construction of the semantics component of BBN's speech understanding system, SPEECHLIS.

Interests--2,3,20,SDI

****

Prof. Allen Newell
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Phone--412:621-2600, ext. 562

My major concerns are:

1. Human Cognition. Currently this is focused at the levels of complex problem solving on the one hand and the architectural structure of the basic information processing system at the other.

2. Production systems as control structures for AI. A reflection of the above, where production systems are of

interest currently. (PSG)

3. Understanding, especially the mapping required to identify methods with external situations. (MERLIN)

4. Protocol analysis of verbal reports, especially the automatization of such analysis. (PAS2)

5. System building, especially implementation system

Interests--1,3,4,5,10,14,15

****

Prof. Donald A. Norman
Department of Psychology
University of California, San Diego
La Jolla, California 92037

Phone--714:452-2947

Dr. Norman studies the mechanisms underlying human information processing, with special emphasis upon memory structures, perception, and language. A major component of his work has been the development of an active structural network model of human memory. The model describes the components of processing including interaction between procedures and knowledge of the human. A major component of the model is the analysis of English language into its underlying propositional structure. The model has been simulated on a large digital computer and includes working interpreter and augmented-transition network parser.

Current work has examined the nature of processing structure in human attentional and perceptual processing. Emphasis has been concentrated on several different aspects of performance, including process of perceptual pattern recognition. One major project is involved in the study of learning and teaching, showing how the active structural network is related to problems in communication between teacher and tutor.

Interests--2,4,5,13,21,human memory

****

Mr. Gordon S. Novak, Jr.
Computer Science Department
University of Texas
Austin, Texas 78712

Phone--512:471-4526; 926-2800, ext. 492; 444-0142

My major current research interest is the investigation of the process of building an internal model which represents the meaning of a paragraph of text. Specifically, I am investigating the process of understanding and solving physics problems at the high school senior/college freshman level. This process involves building an internal model of the interacting physical objects described in the problem statement, identification of the correct physical principles which model the situation and creation of an abstract model of the problem, and finally, solution of the problem using the abstract model. I am writing a program which will accept physics problems in English in essentially the same form as they are given in physics textbooks.

Interests--1,2,4,6,14,15,19,20,21

****

Mr. John C. Olney
System Development Corporation
2500 Colorado Avenue
Santa Monica, California 90406
Phone--213:393-9411, ext. 7524

1. To contribute to the development of routines for interpreting uses of words in non-metaphorically extended senses by working out precise semantic and morphological descriptions of the roughly 2000 standard processes of affixation, conversion (e.g., from a verb sense to a noun sense without affixation), and sense change not accompanied by change in affix or part of speech which have been isolated via semi-automatic processing of the definitions entered in Webster's Seventh Collegiate Dictionary and its pocket abridgment.

2. To promote the application of analytic philosophy to the representation of word meanings and other knowledge in AI devices by selecting, extracting, partially integrating, and partially formalizing conceptual analyses offered for particular terms in the recent philosophical literature (the extracted analyses are being entered in SOLAR (a Semantically-Oriented Lexical Archive)).

3. To investigate patterns of thematic development (primarily at the clause level) in scientific writing and their relationship to anaphoric reference; the procedures include partial translation of Scientific American articles into a formal-logic language and semantic analysis of sentential adverbs and subordinating conjunctions.

Interests--6,11,20,conceptual analysis,robot ethics

****

Prof. Michael H. O Malley
Computer Science
University of California
Berkeley, California 94720

Phone--415:642-4624

My major interest is in language understanding by computer. I am especially interested in those aspects of understanding research which deal with the encoding of syntactic and semantic information into the acoustic signal. For example, I am interested in rhythm and intonation as signals of syntactic and semantic units, the design of parsers which incorporate prosodic information, and human perception of speech.

Interests--2,3,4,10,19,20,21,22

****

Dr. Milos G. Pacak
Bldg. 12A, Room 3039
Computer Research and Technology
National Institutes of Health
Bethesda, Maryland 20014

Phone--301:496-6119

Computational morphology, morphosemantic segmentation of medical compound word forms, their semantic interpretation and the development of corresponding paraphrasing rules; structuring of medical microglossaries; formalized description of semantic relations among syntactic units in medical diagnoses for the purpose of information retrieval.

Interests--none indicated

****

Dr. Jacob Palme
Swedish National Defense
Research Institute
S-10450 Stockholm 80
SWEDEN

Phone--468:63 18 00

We have been producing a natural language question-answering system using English as discourse language. Our system can take both facts, deduction axioms (= natural language if-statements) and questions in natural English. The system is not limited to a special subject area, but is aimed at those kinds of facts

which are usually talked about in natural language. Special emphasis in our project has been on finding a data base representation for facts which have been input in natural language, such that this data base representation (a) is easy to translate to, (b) permits representation of all kinds of facts including deduction axioms and quantified expressions, (c) permits fast and efficient deduction when answering questions.

We now have a working system which can handle many quite complex statements and deductions. Our working system lacks, when this is written (1974) facilities for handling environmental changes with time and for handling not necessarily true belief structures.

We believe that the most important contribution for further research from our work is our system for data base representation.

Interests--2,6,17,20

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Prof. Seymour Papert
MIT AI Laboratory
545 Technology Square
Cambridge, Massachusetts 02139

(no response received)

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Dr. Robert Pasero
Groupe Intelligence Artificielle
UER de Luminy
70 Route Leon Lachamp
13288 Marseille Cedex 2
France

(no response received)

****

Dr. Pearl R. Paulson
9315 East Parkhill Drive
Bethesda, Maryland 20014

Phone--301:530-4372

Interests: Modeling comprehension of connected discourse; evaluation of such models; liaison between artificial intelligence and education.

The first two interests result from creating and evaluating READSUM, a model that used paragraphs from social studies textbooks as input and gave summary sentences as output, where the subject of a summary sentence was the paragraph's main topic and the predicate was that topic's main activity or attribute. The last is because my concern with comprehension began when I was a teacher.

Modeling: A reader's knowledge system as he approaches the passage and how he selects from and alters it. Relating ideas when they occur in different syntactic elements or are expressed in different size syntactic units. Pragmatics, such as varying sentence transformations to expedite comparison of meanings, and determining how much incongruity can be tolerated before modifying a tentative formulation of main ideas.

Evaluation: Objective ways to determine similarity of meaning between two paraphrases--when one is a summary of the other, or when they are created by alternative models, or when one is done by artificial and the other by natural intelligence.

Liaison: Translating gains made by means of artificial intelligence research into improvements in language arts instruction.

Interests--4,5,7,10,15,17,18,20,21

****

Mr. William H. Paxton
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 4111

My major research interests are all related to natural language understanding and can be roughly divided intp four areas:

1. Program architecture for language understanding systems -- the integration of a variety of sources of uncertain information into an efficient, coordinated whole.

2. Parsing algorithms for spoken and written natural language -- control strategies, use of context, focus, etc.

3. Representations for linguistic knowledge -- especially for rules of grammar and semantic interpretation.

4. Syntax and semantics of English -- the development of a linguistically adequate and computationally feasible set of rules and algorithms for translating English into a representation appropriate for machine comprehension.

Interests--1,3,4,6,7,15,16,17,18,19,20,21

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Dr. C. Raymond Perrault
Department of Computer Science
McLennan Physics Laboratory
University of Toronto
Toronto, Canada

Phone--416;928-5474; 288-3378

Formal properties of augmented transition networks, complexity of natural language processing, parsing strategies.

Interests--19,20,21,22

****

Dr. Stanley R. Petrick
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914;945-2175

Natural language question-answering systems, including the syntactic and semantic analysis of input sentences and their translation to computer-interpretable form.

Interests--1,2,3,4,11,13,16,17,19,20,21,22

****

Dr. Brian Phillips
Communication Engineering
University of Illinois at
Chicago
Chicago, Illinois 60680

Phone--none listed

I am currently evaluating a psychological model, in network form, for conceptual knowledge. Linguistically, the model can be viewed as generating the semantic structures underlying speech acts. It can also serve as a medium for conceptual planning.

The model is presently applied to an analysis of discourse coherence. The surface form of discourse is logically incomplete, but 'common knowledge' is used to infer the omissions, thereby reconstructing a logically complete underlying structure, if the discourse is coherent. Current

work centers on formally examining the notions of 'logical completeness', 'plot' and 'thematic' structures in discourse.

Interests--4,11,20

****

Dr. Alain Pirotte
MBLE Research Laboratory
2, AVenue Van Becelaere
1170 Brussels, Belgium

Phone--046:73.41.90

Design and implementation of high-level query languages including (pseudo) natural language for relational data bases.

Interests--2,15,16,17,20

****

Dr. Warren J. Plath
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-1161

My major research interests include:

1. the development of transformational grammars of semantically restricted subsets of natural English, including coverage of such key phenomena as conjunction, pronominalization, quantification and comparison;

2. the development of computational algorithms for parsing sentences with respect to such grammars; and

3. experimental applications involving the employment of transformationally-defined, machine-understandable subsets of natural English for interaction with computers, e.g., in question-answering on formatted data bases.

Interests--1,2,6,19,20,transformational grammar,sentence parsing systems

****

Mr. Vaughan R. Pratt
MIT AI Laboratory
545 Technology Square
Cambridge, Massachusetts 02139

Phone--617:253-5876

My main interest at present is the development of a facility to enable the rapid installation of "English front-ends" in interactive programs. A prototype system, LINGOL (Linguistics Oriented Language) exists and can be wrung from its owner if you persist. It should run in any LISP environment with at most minor modification. Current work is directed towards implementing a large subset of English as the front-end of a hand-eye system at MIT.

Interests--1,2,4,6,11,15,19,20,21

****

Dr. Anne-Louise Guichard Radimsky
Department of Electrical Engineering
University of California
Davis, California 95616

Phone--916:752-2561; 929-1195

My interest lies in the semantic representation of information suitable for man-machine communication in natural language.

I have developed a representation based on Chafe's Semantic Structures and have built a system capable of processing a text found in an elementary math textbook. I am currently developing a system dealing with problem oriented medical records with the intention of studying the introduction of explicit deductive capabilities into the system.

Interests--1,2,4,11,13,17,20

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Prof. D. Raj Reddy
Department of Computer Science
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213

Phone--412:621-2600, ext 149

Current research interests: Computer Science, Artificial Intelligence, Man-Machine Communication, Machine Architecture, Real-time System Design, Speech Input to Computers, Visual Input to Computers, and Graphics.

Interests--1,3,10,19,20

****

Prof. Larry H. Reeker
Computer Science
University of Arizona
Tucson, Arizona 85721

Phone--503:686-4429; 686-4394

1. Simulation of first language acquisition. The "Problem Solving Theory" of language acquisition holds that language learning consists of several interactive types of learning, of which the "structural learning portion involves an interaction, analogous to problem solving, among the child's developing grammar, adult utterances, and situational semantics. A partial simulation is currently in operation and extensions are under way.

2. Computational and mathematical theories of natural language syntax and semantics.

3. Systems-building aids for linguists. The first of these is aimed at the construction of syntactic and semantic systems, using a type of generative semantics model. At the time of this writing, a system is running in SITBOL on the PDP/10, but no detailed documentation is available.

Interests--14,15,16,17,18,19,20,22

****

Prof. Walter Reitman
Mental Health Research Institute
University of Michigan
Ann Arbor, Michigan 48104

Phone--313:764-4220

Representation and utilization of complex knowledge structures. Target situation presently under investigation is the highly skilled player s knowledge about the game of Go, and the linguistic and non-linguistic representations thereof.

Interests--1,4,8,10,14,20

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Dr. Charles J. Rieger
Department of Computer Science
University of Maryland
College Park, Maryland 20742

Phone--301:454-4245

1. Interpretation of Sentence Meaning in Context: How does the meaning of a sentence depend upon contextual expectancies established by preceding sentences? Of particular interest are sentences which are syntactically and conceptually unambiguous as isolated utterances, but which have radically different higher level interpretations in contexts. Current research involves a mechanism called conceptual overlays.

2. Conceptual Memory and Inference: What do the storage, retrieval, reference-establishment and inference mechanisms of conceptual memory look like? What are the commonsense classes of inference people must make to comprehend the meaning of sentences? When is inferencing done, to what extent is it undirected, to what extent is it directed by context, and how abundant is it during ordinary comprehension of text? What is a quantitative measure of comprehension?

3. Meaning Representation of Language Utterances: What is an adequate set of meaning primitives for representing large classes of everyday language utterances? What relational primitives (things like causality, intentionality, enablement) are necessary for representing more abstract concepts such as motivation and purposive planning?

4. Modeling of Belief Systems: What kinds of structures are necessary for storing beliefs? How do beliefs interact with meaning interpretation of language? How does a model of the other party of a conversation affect the interpretation of what he says and what is said to him?

Interests--1,4,6,7,8,12,14,15,17,20,21

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Dr. Christopher K. Riesbeck
Computer Science Department
10 Hillhouse Avenue
Yale University
New Haven, Connecticut 06511

Phone--203:562-7875

Primary interest in the comprehension of natural language texts. By comprehension I mean the assignment of meaningful structures to input sentences. Naturally the task involves interests in a number of other areas. These interests are:

1. Linguistic:
   a. Words, and the nature of word meanings that allow flexible interactions with contextual conditions.
   b. Texts, and the story patterns that provide inter-sentential relationships for those texts.

2. Psychological:
   a. The organization of memory into useful (as opposed to logical) clusters of knowledge.
   b. A set of general information processing mechanisms (that includes those used in comprehension) that can interact easily with each other.

3. Epistemological:
   a. The representation of beliefs:
      (1) about simple states and events, for which the Conceptual Dependency system of Roger Schank is used.
      (2) about situations, i.e., normal sequences of states and events, for which a frames approach (that includes the linguistic story pattern) is used.
   b. The representation of the processing mechanisms, for which the results of my own work on expectations is used.

Interests--4,7,15,20,21

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Mr. John Roach
Department of Computer Sciences
330 Painter Bldg.
University of Texas
Austin, Texas 78712

Phone--none listed

Robot planning and modeling is primary. Natural language parsing and discourse analysis.

Interests--6,7,8,9,11,14,15,20

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Ms. Ann E. Robinson
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 3368

Language understanding systems -- including representation of the language models of the subject domain and the use of such models in parsing and understanding.

Interests--1,2,3,6,14,20,21

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Dr. Jane J. Robinson
Artificial Intelligence Center

Stanford Research Institute
Menlo Park, California 94025

Phone--415:326 6200, ext. 4573

Research interests center on the problems of modeling the cognitive strategies detectable in human and human-machine interactions in which natural language is the code, and continuous speech is the medium. This involves specification in formal terms of the grammar of a 'habitable' subset of a natural language, of syntactic and semantic case relations, and of signals of structure in discourse, especially in cooperative, task-oriented dialog. Included are formal analyses of intonation and other prosodic signals of sentence and discourse level meaning. The pragmatics of achieving a meeting of the minds through dialog is a current focus for research.

Interests--2,3,4,10,11,12,13,19,20,21

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Dr. David Rumelhart
Department of Psychology
University of California, San Diego
La Jolla, California 92037

(no response received)

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Lr. Naomi Sager
NYU Linguistic String Project
Warren Weaver Hall
251 Mercer Street
New York, New York 10012

Phone--212:598-2294; 598-2295

All aspects of computerized natural language processing. In particular: Parsing, text analysis, information retrieval from natural language data bases, fact retrieval.

Also: Computer-aided instruction of Languages, and using natural language.

Also: English in man-machine communication.

Interests--2,3,4,5,6,11,12,13,19

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Prof. Toshiyuki Sakai
Information Science

Kyoto University
Yoshida-Honmachi, Sakyo-Ku
Kyoto, Japan

Phone--075-751-2111

Our research interest is in constructing a speech understanding system for a limited task domain with a vocabulary size of a few hundred words. The system deals with two main problems of natural language processing. First, possible words in an utterance are predicted by utilization of syntactic, semantic, and pragmatic information. Second, the recognized sentence is understood, that is, transfered to an internal representation in computer memory, and an answer or appropriate action taken. Our task is "questions about status or commands for a computer network."

Interests--3,19

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Dr. Morris Salkoff
L.A.D.L. - Tour centrale, 9e
University of Paris VII
2, Place Jussieu
PARIS, 5, FRANCE

Phone--336-2525, poste 5697 or 5692

A program for the automatic syntactic analysis of French has been written that uses a French grammar constructed in accordance with Zellig Harris' theory of string grammar. The analyzer is programmed almost entirely in FORTRAN, with the exception only of a few machine language modules for individual bit processing. The resulting program can operate on any computer with a basic FORTRAN compiler; it is presently operational on the IBM 360 series, and has been tested on a CDC 6600, yielding identical results.

The analyzer, which is entirely independent of the grammar and the lexicon, requires as input a string grammar (of any language), a dictionary which lists for each word the syntactic (and semantic) subclasses of the grammar to which it belongs, and the sentence to be analyzed. The program yields one or more decompositions of the sentence, always few in number, depending on the degree of structural ambiguity. However, none of the analyses differ solely in the point of attachment of various prepositional groups whose function often cannot be formulated precisely.

This program will be used in further research on automatic translation, automatic documentation and other research in data processing in natural language.

Interests--19,20

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Dr. Erik Sandewall
Uppsala University
Datalogilaboratoriet
Sturegatan 1
75223 Uppsala, Sweden

Phone--46-18:11 19 25

Language-Related Interests: Formal systems for representing natural-language information, and their use as 'blueprints' for data structure and retrieval routines in the data base of natural language understanding systems. Programming techniques and supporting program systems for language understanders.

Other Present Interests: Methodology for knowledge data bases (LISP-type data bases) -- data structuring methods, programming methods, limited automatic programming methods, utility programs and data base management, self-describing data bases.

Interests--1,6,15,16,17

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Dr. Remko J. H. Scha
Artificial Intelligence Group
Philips Research Laboratories wB3
Eindhoven, The Netherlands

Phone--040:74 33 65

The development of natural language question-answering systems for accessing large data bases about non-trivial subject matters. These systems should be structured in such a way that they can be said to embody explicit theories about linguistic competence and the semantics of English.

Interests--1,2,4,6,7,8,9,13,14,15,16,17,19,20

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Prof. Roger Schank
Department of Computer Science
Yale University
10 Hillhouse Avenue
New Haven, Connecticut 06520

Phone--203:436-8160

My main interests are in building computer systems that understand natural language. My goal is to someday have a system that can converse intelligently with people about a range of subjects in natural unconstrained style.

My approach to this problem has been to try and understand the nature of meaning. Accordingly, my students and I have designed a conceptual representation system that is intended to provide a canonical form for connecting concepts together in a meaning representation. This representation has been used as the output of language analysis programs and as the input to inference mechanisms that coordinate world knowledge and notions about the intent of a speaker to make sense of what is being said. The MARGIE system designed while I was at Stanford exemplified that approach.

Recently, my concerns have been with the simulation of reasoning processes and the use of knowledge of plans and goals of people to facilitate understanding of stories and participation in dialogue.

Interests--1,2,4,6,7,8,11,12,13,15,20,21,22

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Dr. Greg W. Scragg
Istituto per gli Studi
Semantici e Cognitivi
17 Rue Candolle
1200 Geneva, Switzerland

Phone--091:52 28 51

I am interested in problems of natural language communication, particularly those problems concerning the representation of descriptions of concrete objects and the representations of knowledge of actions.

In the first area I am interested in the problems of translating natural language into some storage representation which should be sufficiently complete so that questions can be answered concerning the nature of the objects and events described. Problems of quantification, specification, and adjectival modification of are of special interest.

I am currently exploring theories of action representation in which the knowledge of how an act is performed (say a simulation routine) can also be used to answer questions about the actions. My current theories say that the descriptions of actions are sketchy and that large amounts of problem solving occur during performance of all but the most learned (habitual) of actions. I am investigating analogical reasoning in this area.

Interests--2,4,6,7,15,17,18,21

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Prof. Stuart C. Shapiro
Computer Science Department
Indiana University
101 Lindley Hall
Bloomington, Indiana 47401

Phone--812:337-1233; 337-6486

My major interest is in the representation and use of semantic information. A major concern has been representing general information and inference rules in a way that allows them to be stored and queried like specific information and also to be used for making inferences. I use question-answering as a paradigm for testing the adequacy of any given representation. Recently, I have begun investigating certain non-classical logics that seem to be more useful to semantic information processing systems than classical logic.

These interests expand into other interests in man-machine communication, specifically, user-oriented query languages and computer assisted instruction techniques that allow a student to control a programmed model of processes that are normally difficult to observe.

Interests--1,2,4,5,6,7,11,12,13,15,16,17,18,20,21

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Mr. Peter B. Sheridan
IBM Watson Research Center
P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:954-2146

Interactive systems based on semantic (conceptual) networks.

Exploration of inferential techniques (deductive and inductive) for the utilisation of such networks in question answering and problem solving.

Interests--1,2,6,7,8,9,10,14,15,16,17,18,19,20,21

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Dr. Edward H. Shortliffe
Room TC 110, Dept. of Medicine
School of Medicine
Stanford University

Stanford, California 94305

Phone--415:497-6977

My interest in natural language processing stems from the practical need for such capabilities in computer-based decision making systems for interactive use by physicians. As a researcher interested in the ways artificial intelligence can be effectively applied to medicine, I participated in the development of a consultation system which seeks to overcome some of the barriers to acceptance of automated decision making in clinical medicine. Since one important capability for achieving this goal is the design of systems that can explain their decisions when asked to do so, a natural language interface which permits physicians to ask questions is a major component of our system. My interest in and involvement with language processing thus rests primarily on the need for such capabilities in my primary research area rather than on an inherent concern with the psychological basis for language and comprehension.

Interests--2,9,15,16

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Prof. Laurent Siklossy
Computer Sciences Department
University of Texas
Austin, Texas 78712

Phone--none listed

Representation of meaning; models of knowledge for language processing; language acquisition; speech synthesis; etc.

Interests--1,2,4,5,6,8,9,11,12,13,14,15,17,18,20,22,
communication.

****

Prof. Robert F. Simmons
computer Science Department
University of Texas
Austin, Texas 78712

Phone--512:471-7316

Computational Linguistics
Natural Language Question Answering
Natural Language CAI
Natural Language to Pictures
Synthesis of Cognitive Processes
Text Understanding Systems

Interests--2,5,6,11,12,14,15,16,17,18,19,20,21

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Mr. Jonathan Slocum
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 2057

I am interested in automated analysis of natural language text, storage of the semantic information (both explicit and derived via inference), and question-answering/information retrieval over the result. Such a system should have a means for the automatic (or at least semi-automatic, human-aided) acquisition of vocabulary and grammar, with graceful degradation of performance in the absence of "complete" understanding. Such a system also requires a detailed world model and a means for manipulating it for question-answering and perhaps problem-solving.

I am also interested in the construction of programming systems (languages, data structures, etc.) required to implement the above.

Interests--1,2,4,6,11,14,15,19,20,21,22

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Mr. Michael Kavanagh Smith
Computer Science Department
University of Texas at Austin
Austin, Texas 78712

Phone--512:471-5023

I am currently engaged in producing a language-to-pictures system for a microworld consisting of static two-dimensional relations (on, next to, supports, between, etc.) and a canonical move, which is encoded as a simple process automaton.

Of particular interest to me are the semantics necessary for discourse.

Interests--2,6,11,13,20

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Dr. Robert L. Smith
Institute for Mathematical
Studies in the Social Sciences
Stanford University

Stanford, California 94305

(no response received)

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Dr. Norman K. Sondheimer
Computer & Information Science
Ohio State University
2024 Neil Avenue
Columbus, Ohio 43210

Phone--none listed

Interested in allowing for spatial reference in natural language understanding systems. This entails studying the ways in which such references are made, the ways in which they can be modeled in semantic structures, and the problems of allowing for the effect of the conversational environment on the interpretation of these references.

Interested in allowing for natural language control of mechanical devices.

Interests--13,20,21,machine control

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Mr. John F. Sowa
IBM Corporation
2651 Strang Boulevard
Yorktown Heights, New York 10598

Phone--914:245-6000

I have been developing a formalism for conceptual graphs that includes Wilks' preference semantics and Schank's inference molecules as special cases. For the past several years, I have been writing a book that presents the formalism, analyzes its relationship to current issues in cognitive psychology, and applies it to problems in linguistics and logic.

Interests--6,15,20,21,conceptual graphs,theoretical psychology

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Dr. Rolf Stachowitz
Linguistics Research Center
University of Texas
PO Box 7247, University Station
Austin, Texas 78712

(no response received)

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Prof. Patrick Suppes
Institute for Mathematical
Studies in the Social Sciences
Stanford University
Stanford, California 94305

(no response received)

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Dr. Alan L. Tharp
Computer Science
North Carolina State University
Raleigh, North Carolina 27607

Phone--none listed

Enabling more people to access a computer by simplifying the man-machine interface is the theme unifying our work in elementary education, linguistics, information retrieval and cable television. Linguistics and cable television are tools for simplifying the man-computer interface in applications for elementary education and information retrieval. Natural language processing techniques and computer software and hardware technology are advanced to the degree that it is now feasible to build natural language question answering systems in specific limited applications. By implementing such systems at least two goals are fulfilled. The first is to satisfy an immediate information need as simply as possible. The second and perhaps more important is to better focus on the limitations of current theory and technology and to organize these limitations, together with positive observations, in hopes of better understanding the understanding process.

Interests--2,4,20,cable television

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Dr. Bozena Henisz Thompson
Information Sciences
California Institute of Technology
Pasadena, California 91109

(no response received)

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Ms. Carol H. Thompson
IBM Watson Research Center

P.O. Box 218
Yorktown Heights, New York 10598

Phone--914:945-1621

My major interest is the construction of an interactive information facility which enables on-line computer users to find out what they need to know about available commands, programs, techniques, etc., by asking questions in unrestricted English and by "menu" selection. This involves analysis of both user questions and the natural language text of formatted computer manuals.

Programs to extract information from the physical layout of a manual as well as its statistical, syntactic and semantic properties are being developed. These programs provide automatic generation of initial data bases for the information facility and greatly reduce the time consuming and tedious task of generating data bases. A key word and phrase approach which was initially used for question processing, though reasonably effective, has been found to be insufficient. The approach now under investigation involves an attempt to determine the focus of a user's question and the focuses of paragraphs in manuals, using syntactic and semantic techniques.

Interests--1,2,4,5,11,19,20,21

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Mr. Craig W. Thompson
Computer Science Department
University of Texas
Austin, Texas 78712

Phone--512:471-7316

Main Area of Interest: Semantics of natural language.

Current Area of Research: The logical and pragmatic properties of a "tree" of dependent features (physobj, animate, human, etc.). The tree is composed of noun-ish entities related by presupposition and inheritance of properties in a hierarchical form. The properties associated with the nodes in the tree are in the form of normalcy information which relates the noun-ish entities with their characteristic activities and states. Specific state-of-the-world knowledge may be generalized into "normalcy" information and "normalcy" information may be used in inferences.

Related Areas of Interest:

1. Problems relating to word definitions.
2. How to represent contexts.

3. Discourse Structure -- text organization and representation -- operations on text structures: paraphrase, summary, rearrangement.

Interests--2,6,7,8,11,12,14,15,17,18,19,20

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Prof. Frederick B. Thompson
Information Sciences
California Institute of Technology
Pasadena, California 91109

(no response received)

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Mr. Jun-ichi Tsujii
(see entry for Nagao)

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Dr. Francis Douglas Tuggle
Department of Computer Science
University of Kansas
18 Strong Hall
Lawrence, Kansas 66045

Phone--913:864-4482

1. Simulation of Human Thought -- studies of human problem-solving and decision-making in a variety of tasks, approaching real-worldness in complexity. Isolation and specification of heuristics, searching and alternative generating procedures, and strategies. Current work: (a) the study of human cognition as affected by social setting and emotional variables, and (b) the study of strategy formulation and its use in problem-solving and decision-making. The aim is to provide computer assistance to naive, management-level decision-makers.

2. Natural Language Understanding Systems -- development of systems capable of understanding, responding to, and initiating written natural language utterances. Current work: (a) systems able to teach processes and to engender "insight" into a mass of data or a concept on the part of a learner, and (b) systems to accept short (5-10 sentences) dialogues and to decide whether or not they are humorous and for what reasons humor is or is not present. The aim is to eventually develop man-machine systems capable of facile communication with naive computer users.

Interests--4,5,9,10,11,14,20

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Prof. Leonard Uhr
Computer Sciences Department
University of Wisconsin
1210 West Dayton Street
Madison, Wisconsin 53706

Phone--608:262-7946

Developing computer programmed models for learning and then using language, where language and objects are mixed together in a single input scene. Systems have been developed to explore different learning mechanisms for complex language structures, and to recognize words, suggestions and commands about sensed objects that must also be recognized. Thus language learning and use is viewed as a part of the total cognitive process of assessing and responding appropriately to the sensed external environment.

Interests--6,18,20,22

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Dr. Eric Van Utteren
Artificial Intelligence Group
Philips Research Laboratories WB345
Eindhoven, The Netherlands

Phone--040:74 25 44

General interest: system building and particularly interested in control structure problems in complex software systems.

Present occupation: building of a natural language question-answering system called PHLIQA (for PHILIPS QUESTION ANSWERING). First prototype to be ready in Spring of 1975.

Interests--1,2,9,16,21

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Dr. Donald E. Walker
Artificial Intelligence Center
Stanford Research Institute
Menlo Park, California 94025

Phone--415:326-6200, ext. 3071

My major interests are in the development of systems that can interact conversationally with a person through spoken or written language in the performance of a particular task. In building these systems, my emphasis is on the way that various

sources of knowledge contribute both to the process of understanding and to the embodiment of a model of natural language that is of interest to linguists as well as to computational linguists and specialists in artificial intelligence. Syntax, semantics, pragmatics, and discourse structures are the sources of knowledge that I am most directly involved with, although the work on speech understanding also entails analyses of acoustics, phonetics, phonology, and prosodics, as well, of course, as of all the linkages between these elements in a comprehensive model of language. I also am becoming increasingly interested in the contexts in which these capabilities can be used and in how applications can guide system development.

Interests--1,2,3,4,11,13,19,20,21

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Prof. David L. Waltz
Coordinated Science Laboratory
Room 6-143
University of Illinois
Urbana, Illinois 61801

Phone--217:333-6071

My main research involves writing a system to answer questions posed in natural English, using a large data base containing aircraft maintenance and flight data. The system is designed to handle pronoun and phrase reference, to save partial results, and to bypass data base search in cases where questions are unreasonable or can be answered by reference to general world knowledge.

I am also supervising research in general representation of linguistic and world knowledge, in comprehension of text passages, and in related areas of linguistic analysis. I am also continuing some effort in various aspects of computer vision and robotics.

Interests--2,6,11,13,15,16,17,20,21

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Ms. Eleanor H. Warnock
Department of Psychology, C009
University of California, San Diego
La Jolla, California 92037

Phone--none listed

My interests are primarily in knowledge representation -- especi lly representation in a semantic network -- and language

processing. Work with language is strongly semantic in orientation.

I have been working with the SCHOLAR system at BBN, an instructional and question-answering system that converses in a subset of English. Recently, we have been concerned with (the storing and processing of functional and causal information. We are also concerned with isolating the inferential strategies that allow people to deal with the incompleteness and uncertainty of their knowledge.

Other interests include verbs, case grammar, pronouns and reference, and instructional strategies.

Interests--2,4,5,15,19,20

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Dr. Donald Arthur Waterman
Psychology Department
Carnegie-Mellon University
Pittsburgh, Pennsylvania 15213
Phone--412:621-2600, ext. 483

Machine Induction: I am interested in the problem of developing programs which can learn from experience to modify their behavior and thus acquire or self-program some particular problem solving skill. Interest here is focused on both the development of new AI techniques and modeling of human learning processes.

Production Systems: I am interested in the use and development of the production system as a control structure for AI programs, and for modeling human cognitive processes. Production systems provide an interesting way to model learning or self-programming mechanisms.

Protocol Analysis: I am interested in the problem of automatically transforming a verbal protocol of a subject solving a problem into a working computer model of the subject's problem solving process. This includes a number of inductive inference problems, i.e., induction of the problem space and induction of a production system model of the problem solving process inferred by the protocol. Also included are problems of natural language analysis and speech understanding.

Memory Modeling and Question Answering: I am interested in developing models of human memory and/or AI programs which can store and retrieve information, answer questions, and carry on a conversational dialogue with a human.

Interests--2,4,9,10,13,14,18,20

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Mr. Ralph M. Weischedel
145 Glen Riddle Road
Media, Pennsylvania 19063

Computer and Information Science
University of Pennsylvania

Phone--215:566-6873

Linguistic literature has much to offer computer scientists interested in language processing. For example, we are currently investigating two concepts appearing in the linguistic literature: presupposition and entailment. These concepts demonstrate complex interaction between semantics and syntax. A computer program is being developed to generate presuppositions and entailments from an input sentence.

Many types of knowledge are difficult to represent other than by natural language. This type of knowledge offers interesting domains of discourse for research in natural language understanding in the future.

Interests--1,3,6,7,8,11,12,13,15,17,19,20,21,22

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Dr. Yorick Wilks
Artificial Intelligence
Hope Park Square
Edinburgh, EH8 9NW
Scotland, UK

Phone--none listed

My work has been the design and implementation of a semantic analyzer and inferencer for English. It functions within an experimental English-French machine translation system, and this provides a convenient test of the correctness or otherwise of the semantic understanding achieved, since its adequacy in resolving, say, pronoun references can be judged right or wrong by looking at the French output. The system runs on-line as a package of LISP and MLISP programs at the Artificial Intelligence Laboratory at Stanford University, California.

It takes as input small paragraphs of English drawn from a vocabulary of 400 or so words. These are made up by the user at the console. There is no significant syntactic analysis component, and all the computations are done by considering word meanings as expressed by trees of semantic primitives. Out of these the system endeavors to construct a complex entity for each clause or phrase of input, which is called a template and consists of a canonical network of the tree structures that

represent word senses. In order to construct an adequate representation of text, in terms of interlinked templates, the system has access to other structured entities called paraplates and to commonsense inference rules. There is a single overall inference principle in the system: that of always, at every stage, preferring as a representation the densest semantic network it can establish at that stage.

interests--4,11,12,15,20

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Prof. Terry Winograd
Artificial Intelligence Laboratory
Stanford University
Stanford, California 94305

Phone--415:497-1963

My main interest lies in the general theoretical issues of artificial intelligence -- how knowledge can be represented and manipulated within a computational system. My bias is towards the "psychological" flavor of AI, being most interested in gaining an understanding of how human intelligence works, rather than concen--ating on developing practical devices. In this vein, I see language as one of the best windows we have on human intelligence, and place my major emphasis on research oriented towards natural language understanding. However, I believe that there is a strong interaction between the kinds of representation and processing needed for natural language and those needed for many other sorts of intelligent activity, and want to devote part of my effort to making those connections.

As a user of computer languages and systems, I have developed a strong interest in thinking about how they could be improved. In particular I want to explore the ways in which programming languages and systems could be built with an intelligent model of what goes on in programming, and what a particular user is doing. I believe that systems of the future will be designed so that the system can interact in terms of the user's conceptual structure, rather than forcing the user to learn the system's way of viewing the world. I think that many of the issues involved in doing this overlap nicely with the issues of language understanding, and plan to explore them further.

Interests--1,2,4,6,7,8,9,11,12,13,14,15,16,17,18,19,20,21

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Dr. Pierre Wodon
(see entry for Pirotte)

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Dr. William A. Woods
Bolt Beranek and Newman Inc.
50 Moulton Street
Cambridge, Massachusetts 02138

Phone--617:491-1850

Research interests are in all aspects of the natural language understanding process. Primary emphasis is in developing computer techniques for understanding natural language and producing explanatory theories of the language understanding process. Contributions to the field include formal techniques for semantic interpretation of English sentences, the augmented transition network grammar (ATN) formalism (a grammar formalism capable of the same types of analyses as a Chomsky-type transformational grammar, but computationally tractable and also more suitable to modeling human linguistic performances), the LUNAR system (a natural English question answering system dealing with the Apollo 11 moon rocks), and current research in continuous speech understanding. Current interests include syntactic analysis and grammars, semantics and semantic interpretation, knowledge representation and mechanical inference, and continuous speech understanding.

Interests--1,2,3,4,6,11,15,16,17,19,20,21

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Prof. Lotfi Zadeh
Electrical Engineering
University of California
Berkeley, California 94720

(no response received)

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