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of the
Association for
Computational Linguistics**

Proceedings of the Conference

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PREFACE

This volume contains papers prepared for the *Twenty-Seventh Annual Meeting of the Association for Computational Linguistics*, held 26-29 June 1989 at the University of British Columbia in Vancouver. The authors of these papers—and of the abstracts we could not include in the program—deserve sincere thanks. Thanks also to James Allen, Mark Liberman, and Emmanuel Schegloff, for presenting invited talks; to Don Walker, for organizing the panel on “Computational Linguistics and the Humanities”; and to Jared Bernstein, Aravind Joshi, Patti Price, Richard Sproat, Michael Tanenhaus, K. Vijay-Shanker, and David Weir for presenting tutorials.

A number of people worked behind the scenes to make this program possible and deserve recognition. Very special thanks go to the members of the program committee, who performed the herculean task of reading and commenting on a record number of submissions: Joyce Friedman, *Boston University*; Barbara Grosz, *Harvard University*; Robert Kasper, *University of Southern California, Information Sciences Institute*; Richard Kittredge, *Université de Montréal* and *Odyssey Research Associates*; Beth Levin, *Northwestern University*; Steve Lytinen, *University of Michigan*; Len Schubert, *University of Rochester*; Martha Palmer, *Unisys*; Fernando Pereira, *SRI International*; Carl Pollard, *Carnegie-Mellon University*; Mark Steedman, *University of Pennsylvania*. Thanks also to Richard Rosenberg for handling local arrangements and exhibits; to Martha Pollack for arranging tutorials; to Candy Sidner for much good advice; and to Esperanza Plata for invaluable secretarial help. Finally, deepest thanks to Don Walker for providing the historical continuity and the enormous amount of hard work that make ACL function and to Betty Walker for helping him in this enterprise. Once again, the community is in their debt.

Julia Hirschberg, *AT&T Bell Laboratories*
Program Chair

CONFERENCE PROGRAM

MONDAY MORNING, 26 JUNE

- 9:00–12:30 **TUTORIAL SESSIONS**
- Theatre 4 *Constrained Grammatical Formalisms*
Aravind Joshi, K. Vijay-Shanker, & David Weir
- Theatre 5 *Psycholinguistic Approaches to Language Comprehension*
Michael Tanenhaus

MONDAY AFTERNOON, 26 JUNE

- 2:00–5:30 **TUTORIAL SESSIONS**
- Theatre 4 *Morphology and Computational Morphology*
Richard Sproat
- Theatre 5 *Speech Technology*
Jared Bernstein & Patti Price

MONDAY EVENING, 26 JUNE

- 8:00–9:30 **PANEL: Computational Linguistics and Research in the Humanities**
Don Walker (Chair), Patrick Hanks, Mary Dee Harris, Mark Liberman, Martha Palmer, Antonio Zampolli

TUESDAY MORNING, 27 JUNE

- 9:00–9:15 **Opening remarks and announcements**
- 9:15–9:40 *A Transfer Model Using a Typed Feature Structure Rewriting System with Inheritance*
Rémi Zajac
- 9:40–10:05 *A Semantic-Head-Driven Generation Algorithm for Unification-Based Formalisms*
Stuart M. Shieber, Gertjan van Noord, Robert Moore, & Fernando C. N. Pereira
- 10:35–11:00 *A Three-Valued Interpretation of Negation in Feature Structure Descriptions*
Anuj Dawar & K. Vijay-Shanker
- 11:00–12:00 **Natural Language and Knowledge Representation: So Close Together Yet So Far Apart**
James Allen, **INVITED SPEAKER**

TUESDAY AFTERNOON, 27 JUNE

- 1:30–1:55 *Logical Forms in the Core Language Engine*
Hiyan Alshawi & Jan van Eijck
- 1:55–2:20 *Unification-Based Semantic Interpretation*
Robert C. Moore
- 2:20–2:45 *Reference to Locations*
Lewis G. Creary, J. Mark Gawron, & John Nerbonne
- 3:05–3:30 *Getting at Discourse Referents*
Rebecca J. Passonneau
- 3:30–3:55 *Con conversationally Relevant Descriptions*
Amichai Kronfeld

- 3:55–4:20 *Cooking Up Referring Expressions*
Robert Dale
- 4:40–5:05 *Word Association Norms, Mutual Information and Lexicography*
Kenneth Ward Church & Patrick Hanks
- 5:05–5:30 *Lexical Access in Connected Speech Recognition*
Ted Briscoe
- 5:30–5:55 *Dictionaries, Dictionary Grammars and Dictionary Entry Parsing*
Mary S. Neff & Branimir K. Boguraev

WEDNESDAY MORNING, 28 JUNE

- 9:00–9:25 *Some Chart-Based Techniques for Parsing Ill-Formed Input*
Chris Mellish
- 9:25–9:50 *On Representing Governed Prepositions and Handling “Incorrect” and Novel Prepositions*
Hatte Blejer, Sharon Flank, & Andrew Kehler
- 9:50–10:15 *Acquiring Disambiguation Rules from Text*
Donald Hindle
- 10:45–11:10 *The Effects of Interaction on Spoken Discourse*
Sharon L. Oviatt & Philip R. Cohen
- 11:10–12:10 **Repair and the Organization of Natural Language**
Emmanuel Schegloff, **INVITED SPEAKER**

WEDNESDAY AFTERNOON, 28 JUNE

- 1:30–1:55 *How to Cover a Grammar*
René Leermakers
- 1:55–2:20 *The Structure of Shared Forests in Ambiguous Parsing*
Sylvie Billot & Bernard Lang
- 2:50–3:15 *A Calculus for Semantic Composition and Scoping*
Fernando Pereira
- 3:15–3:40 *A General Computational Treatment of the Comparative*
Carol Friedman
- 3:40–4:05 *The Lexical Semantics of Comparative Expressions in a Multi-Level Semantic Processor*
Duane E. Olawsky
- 4:25–4:50 *Automatic Acquisition of the Lexical Semantics of Verbs from Sentence Frames*
Mort Webster & Mitch Marcus
- 4:50–5:15 *Computer Aided Interpretation of Lexical Cooccurrences*
Paola Velardi & Maria Teresa Pazienza
- 5:15–5:40 *A Hybrid Approach to Representation in the Janus Natural Language Processor*
Ralph M. Weischedel
- 6:30–7:30 **RECEPTION**
Museum of Anthropology
- 7:30–10 **BANQUET**
Museum of Anthropology
Presidential Address: Candy Sidner

THURSDAY MORNING, 29 JUNE

- 9:00–9:25 *Planning Text for Advisory Dialogues*
Johanna D. Moore & Cécile L. Paris
- 9:25–9:50 *Two Constraints on Speech Act Ambiguity*
Elizabeth A. Hinkelman & James F. Allen
- 10:10–11:10 **How Many Words Do People Know?**
Mark Liberman, INVITED SPEAKER
- 11:10–12:00 **BUSINESS MEETING & ELECTIONS**
Nominations for ACL Offices for 1990
President: Jerry Hobbs, *SRI International*
Vice President: Ralph Grishman, *New York University*
Secretary-Treasurer: Don Walker, *Bellcore*
Executive Committee (1990-1992): Kathleen McKeown, *Columbia University*
Executive Committee (1990-1991): Wolfgang Wahlster, *Universität des Saarlandes*
Nominating Committee (1990-1992): Candy Sidner, *BBN Systems & Technologies*

THURSDAY AFTERNOON, 29 JUNE

- 1:30–1:55 *Treatment of Long Distance Dependencies in LFG and TAG: Functional Uncertainty in LFG Is a Corollary in TAG*
Aravind K. Joshi & K. Vijay-Shanker
- 1:55–2:20 *Tree Unification Grammar*
Fred Popowich
- 2:20–2:45 *A Generalization of the Offline Parsable Grammars*
Andrew Haas
- 3:15–3:40 *Discourse Entities in Janus*
Damaris M. Ayuso
- 3:40–4:05 *Evaluating Discourse Processing Algorithms*
Marilyn A. Walker
- 4:05–4:30 *A Computational Mechanism for Pronominal Reference*
Robert J.P. Ingria & David Stallard
- 4:50–5:15 *Parsing as Natural Deduction*
Esther König
- 5:15–5:40 *Efficient Parsing for French*
Claire Gardent, Gabriel G. Bès, Pierre-François Jurie, & Karine Baschung

TUTORIALS

Constrained Grammatical Formalisms

Aravind Joshi, *University of Pennsylvania*; K. Vijay-Shanker, *University of Delaware*; David Weir, *Northwestern University*

Our goal is to review a range of constrained grammatical formalisms by considering the following aspects: key features of language structure the formalisms try to capture, linguistic adequacy, mathematical and computational properties, parsing strategies, kinds of structural descriptions supported, strategies for embedding them in the unification framework, etc. We will focus on those formalisms characterized as mildly context-sensitive. The presentation will be based on examples rather than on formal proofs. Therefore, it will be appropriate for a wide range of computational linguists, even those whose investments in the construction of a lexicon and a grammar do not allow them the luxury of playing with alternative formalisms now.

Psycholinguistic Approaches to Language Comprehension

Michael Tanenhaus, *University of Rochester*

I will present a selective review of recent psycholinguistic work in three areas: (1) word recognition and lexical access; (2) parsing, with a focus on attachment ambiguity and gap-filling; and (3) anaphora resolution. In each of these areas, I will summarize some of the influential ideas and the empirical results that have emerged during the last few years. Basic information will be provided about some of the methodological advances that are enabling psycholinguists to provide detailed information about immediate or "on-line" comprehension processes. I will also identify some of the controversial issues that I expect will be the focus of psycholinguistic research for the next few years, and I will outline some areas where more interaction between computational linguistics and experimental psycholinguists would be especially fruitful.

Morphology and Computational Morphology

Richard Sproat, *AT&T Bell Laboratories*

Why study the structure of words computationally—why not just look up words in a dictionary without considering their internal structure? Knowledge of morphology is useful in applications as diverse as speech synthesis, parsing, machine translation, spelling correction, and Japanese text-editing. The tutorial will outline some major results in theoretical morphology which affect computational issues, including recent linguistic work on the phonological, syntactic and semantic properties of words. Particular pieces of work in computational morphology will be discussed, all of which deal with theoretically interesting issues to a greater or lesser extent, and many of which were done with a particular application in mind. Among the systems discussed will be the Decomp module of the MITalk text-to-speech system, and the KIMMO Two-Level morphological analysis system. There will also be some discussion of computational work in areas closely related to morphology, including the interpretation of compound nouns in English, and the recognition of word boundaries in inputs where such boundaries are not marked, such as speech or Chinese text. Some of the recent debate on the computational complexity of morphological analysis will be addressed.

Speech Technology

Jared Bernstein and Patti Price, *SRI International*

This tutorial will review the basics of speech production and perception, followed by an overview of the major speech processing applications including coding-decoding for transmission, speaker recognition, speech recognition, speech synthesis, and related medical and educational applications. The core of the tutorial is an in-depth review of speech synthesis and recognition, along with a discussion of metrics for their evaluation and current directions of research. The presentation on text-to-speech synthesis will cover current practice and research issues in letter-to-sound conversion, prosodic construction, and spectral composition. The presentation of recognition will emphasize methods for acoustic feature extraction, lexical modeling, and word matching. The integration of syntactic and semantic knowledge in recognition and synthesis will also be covered.

PANEL

Computational Linguistics and Research in the Humanities

Don Walker (Chair), *Bellcore*; Patrick Hanks, *Collins Publishers*; Mary Dee Harris, *SRA Corporation*;
Mark Liberman, *AT&T Bell Laboratories*; Martha Palmer, *Unisys*; Antonio Zampolli, *University of Pisa & CNR*

Humanists have carried out careful analyses of selected bodies of literary texts, although usually not with sophisticated linguistic tools. Computational linguists have developed new techniques for examining linguistic structure, but only recently have begun to study naturally occurring texts and to explore the characteristics of particular collections. A Text Encoding Initiative has just been established to formulate and disseminate international guidelines for the encoding and interchange of machine-readable texts intended for literary, linguistic, historical, or other textual research. A Data Collection Initiative has also been started to collect, annotate, and tag a large body of English texts. Other initiatives in the United States, Europe, and Japan are pursuing similar directions. The session will consider these developments and explore the mutual relevance of corpus-based language analysis and language-based corpus analysis in this larger context.

Organized with the cooperation of the *Association for Computers and the Humanities* and the *Association for Literary and Linguistic Computing*.

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