Third Conference on Applied Natural Language Processing

Association for Computational Linguistics

Proceedings of the Conference

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PREFACE

The focus of the *Third Conference on Applied Natural Language Processing* is on the application of natural language processing techniques to real world problems with the aim of featuring the best work presently available in the world. It is the first time that this conference of the Association for Computational Linguistics has been held outside of the United States: it follows on from ones held in Santa Monica, California in 1983 and in Austin, Texas in 1988.

Thirty papers and eighteen posters were selected from one hundred submissions to the program committee from four continents. A rich demonstration program of about thirty system demonstrations together with a video program, show concretely the level of achievement of applied natural language processing research.

The success is due to to a number of people. In the first place to Don Walker (ACL Secretary-Treasurer, Bellcore) who encouraged us and gave his precious advice on all the phases of the conference organization. The main credit for the success of the conference of course goes to the paper, poster video and demo authors. The majority of submitted papers reported were of high quality work and to select only fewer than one third of them for inclusion as full papers in the program has been a very difficult task for the program committee. Some other submissions were thought as more appropriate for a poster presentation. The main criteria for posters was that the material seemed to be best presented in that format. A two page abstract of each poster is also included in this volume. We are indebted to the Program Committee members, who have worked with a lot of dedication and seriousness and have shown the capability for making difficult decisions:

Robert Amsler, *MITRE*
Giacomo Ferrari, *Univ. of Pisa*
Eduard Hovy, *USC/ISI*
Paul Jacobs, *General Electric*
Martin Kay, *Xerox PARC*
Mark Liberman, *Univ. Pennsylvania*
Paul Martin, *IBM*
Kathy McKeown, *Columbia Univ.*
Sergei Nirenburg, *Carnegie Mellon Univ.*
Makoto Nagao, *Kyoto Univ.*
Remko Scha, *Univ. of Amsterdam*
Karen Sparck Jones, *Univ. of Cambridge*
Henry Thompson, *Univ. of Edinburgh*
Wolfgang Wahlster, *DFKI*

The invited speakers are a major attraction for this conference: Bill Woods, Igor Melcuk and Norm Sondheimer, from different points of view, have a lot to say to us (even if they all modestly seem not to be aware of this.....). We thank them a lot.

The conference could not have occurred without the encouragement of Luigi Stringa, Director of IRST, and the organizational competence of Tullio Grazioli, who headed the local arrangements. To him our thanks as to all of the IRST staff involved. We are particularly indebted to Jon Slack, who organized the tutorials; to Carlo Strapparava, who

has taken care of the demonstrations, and to the preconference workshop organizers. But perhaps the persons that at the end we must thank the most are our secretaries: Carola Dori, IRST, and Diane Bass, BBN Systems and Technologies. They have done invaluable work. We simply could not have held the conference if it were not for them.

Madeleine Bates, *BBN Systems and Technologies*
Oliviero Stock, *IRST, Istituto per la Ricerca Scientifica e Tecnologica*
Program Committee Chairs

CONFERENCE PROGRAM

MONDAY, 30 MARCH

PRECONFERENCE WORKSHOPS

9:00-12:30
14:30-18:00 *Empirical Models and Methodology for Natural Language Dialogue Systems*
Lars Ahrenberg, Nils Dahlback, Arne Jonsson (Linköping University)

9:00-12:30
14:30-18:00 *Fully-Implemented Natural Language Understanding Systems*
Kai von Luck (IBM Deutschland), Claus-Rainer Rollinger (Univ. Osnabrück), Hans-Joachim Novak (IBM Deutschland)

TUESDAY, 31 MARCH

TUTORIALS

9:00-12:30 *The Current Status of Machine Translation Systems*
Jun-ichi Tsujii (University of Manchester)

9:00-12:30
14:30-18:00 *Evaluation of Natural Language Modalities*
Sharon Oviatt, Philip Cohen (SRI International)

14:30-18:00 *Speech Recognition for Natural Language Processing Researchers*
Renato DeMori (McGill University)

WEDNESDAY, 1 APRIL

9:00 - 10:00 Guest Speaker: **William Woods** (Sun Microsystems)
Knowledge and Language: Challenges for the 90's

10:30-11:00 Conference Opening
Welcome address: Don Walker (ACL Secretary), Luigi Stringa (Director of IRST)

11:00-12:30 **SESSION 1: DIALOG AND SEMANTICS**

Deriving Database Queries from Logical Forms by Abductive Definition Expansion
Rayner M., Alshawi H. (SRI International, UK)

A Dialog Control Algorithm and Its Performance
Smith R.W., Hipp R.D., Bierman A.W. (Duke University)

An Approach to Multilevel Semantics for Applied Systems
Lavelli A., Magnini B., Strapparava C. (IRST)

14:30-15:30 **SESSION 2: NLP AND SPEECH**

A Parser for Real-Time Speech Synthesis of Conversational Texts
Bachenko J., Daugherty J., Fitzpatrick E. (AT&T Bell Labs.)

Real-Time Linguistic Analysis for Continuous Speech Understanding
Baggia P., Gerbino E., Giachin E., Rullent C. (CSELT)

16:00-18:30 **SESSION 3: GENERATION**

Applied Text Generation
Rambow O. (University of Pennsylvania), Korelsky T. (COGenTex Inc.)

Automatic Generation of Multimodal Weather Reports from Datasets
Kerpedjiev S.M. (Institute of Mathematics, Sofia)

Generating Spatial Descriptions for Cross-modal References
Wazinski P. (University of Saarbrücken)

Automatic Generation of On-Line Documentation in the IDAS Project
Reiter E., Mellish C., Levine J. (University of Edinburgh)

Integrating Natural Language Components into Graphical Discourse
Dilley S., Bateman J., Thiel U., Tissen A. (GMD)

THURSDAY, 2 APRIL

9:00-10:00 Guest Speaker: **Igor Melcuk** (Université de Montréal)
An Emigrant's View of Applied NLP

10:30-12:30 **SESSION 4: LEXICON ACQUISITION**

The Acquisition of Lexical Knowledge from Combined Machine-Readable Dictionary Sources
Sanfilippo A. (University of Cambridge), Poznanski V. (Université Libre de Bruxelles)

The ACQUILEX LKB: Representation Issues in Semi-Automatic Acquisition of Large Lexicons
Copestake A. (University of Cambridge)

Computational Lexicons: the Neat Examples and the Odd Exemplars
Basili R., Pazienza M.T. (Università Tor Vergata, Roma), Velardi P. (Università di Ancona)

Automatic Learning for Semantic Collocation
Sekine S. (Matsushita Electric Industrial Co.), Carroll J.J., Ananiadou S., Tsujii J. (University of Manchester)

14:30-16:00 **SESSION 5: ERROR CORRECTION**

Detecting and Correcting Morpho-syntactic Errors in Real Texts
Vosse T. (Nijmegen University)

XUXEN: A Spelling Checker/Corrector for Basque Based on Two-Level Morphology

Agirre E., Alegria I., Arregi X., Artola X., Diaz de Ilarraza A., Maritxalar M., Sarasola K. (Universidad del Pais Vasco), Urkia M. (U.Z.E.I.)

Extended Spelling Correction for German
Kese R., Dudda F., Heyer G., Kugler M. (TA Triumph-Adler AG)

16:30-18:30 **SESSION 6: CORPORA AND TAGGING**

A Practical Part-of-Speech Tagger
Cutting D., Kupiec J., Pedersen J., Sibun P. (Xerox PARC)

DILEMMA-2: a Lemmatizer-Tagger for Medical Abstracts
Paulussen H. (FUNDP, Namur), Martin W. (Free University Amsterdam)

A *Corpus-Based Statistical Approach to Automatic Book Indexing*
Chang J.S., Tseng T.Y., Cheng Y., Chen H.C., Cheng S.D. (National Tsing Hua University), Ker S.J. (SooChow University), Liu J.S. (Sampo Research Institute)

A Simple Rule-Based Part of Speech Tagger
Brill E. (University of Pennsylvania)

13:30 - 16:30 **POSTERS**

Tagging and Alignment of Parallel Texts: Current Status of BCP
Winarske A., Warwick-Armstrong S. (ISSCO), Hajic J. (Charles University)

Robust Parsing of Natural Language Descriptions Expressed in Telegraphic Style
Fasolo M., Garbuio L., Malanima A. (CERVEDomani), Guarino N. (LADSEB-CNR)

Overview of Natural Language Processing of Captions for Retrieving Multimedia Data
Guglielmo E. (Naval Weapons Center), Rowe N.C. (Naval Postgraduate School)

MORPHE': A Practical Compiler for Reversible Morphology Rules
Leavitt J.R.R. (Carnegie Mellon University)

Practical World Modeling for NLP Applications
Carlson L. (U.S. Dept. of Defense), Nirenburg S. (Carnegie Mellon University)

Portable Natural Language Generation using SPOKESMAN
Meteer M. (Rensselaer Polytechnic Institute)

A Method of Automatic Hypertext Construction from an Encyclopedic Dictionary of a Specific Field
Kurohashi S., Nagao M., Sato S., Murakami M. (Kyoto University)

Comparisons in NLIs: Datenbank-Dialog and the Relevance of Habitability
Trost H. (DFKI), Heinz W., Matiasek J., Buchberger E. (OEFAI)

A Tool for Grammar Engineering
Erbach G. (University of Saarland)

Dialogue Management for Telephone Information Systems

McGlashan S., Fraser N., Gilbert N. (University of Surrey), Bilange E. (Cap Gemini Innovation), Heisterkamp P. (Daimler-Benz AG), Youd N. (Logica Cambridge Ltd)

Lexicon Design Using a Paradigmatic Approach
Dumitrescu C. (Research Institute for Informatics, Bucharest)

Acquiring and Exploiting the User's Knowledge in Guidance Interactions
Shifroni E., Ornan U. (Technion - Israel Institute of Technology)

Learning a Scanning Understanding for "Real-World" Library Categorization
Wermter S. (University of Hamburg)

SEISD: An Environment for Extraction of Semantic Information from On-Line Dictionaries
Ageno A., Castellon I., Rigau G., Ribas F., Rodriguez H., Verdejo F. (Univ. Politècnica de Catalunya), Marti M.A., Taulé M. (Univ. de Barcelona)

Multi-purpose Development and Operation Environments for Natural Language Applications
Nirenburg S., Shell P., Cohen A., Cousseau P., Grannes D., McNeilly C. (Carnegie Mellon University)

The Role of Testing in Grammar Engineering
Volk M. (University of Koblenz-Landau)

Lexical Processing in the CLARE System
Carter D.M. (SRI International, UK)

20:00 Banquet

FRIDAY, 3 APRIL

9:00-10:00 **SESSION 7: EVALUATION**

Evaluating Parsing Strategies Using Standardized Parse Files
Grishman R., Macleod C., Sterling J. (New York University)

A Practical Methodology for the Evaluation of Spoken Language Systems
Boisen S., Bates M. (BBN)

10:30-12:30 **SESSION 8: TEXT AND INFORMATION EXTRACTION**

Automatic Extraction of Facts from Press Releases to Generate News Stories
Andersen P.M., Hayes P.J., Huettner A.K., Nirenburg I.B., Schmandt L.M. (Carnegie Group Inc), Weinstein S.P. (Reuters Ltd)

Joining Statistics with NLP for Text Categorization
Jacobs P.S. (General Electric Research and Development Center)

Robust Processing of Real-World Natural-Language Texts
Hobbs J.R., Appelt D.E., Bear J., Tyson M. (SRI International)

An Efficient Chart-based Algorithm for Partial-Parsing of Unrestricted Texts

McDonald D.D.

14:00-15:30 **SESSION 9: MACHINE TRANSLATION AND TOOLS**

Zero Pronoun Resolution in a Japanese to English Machine Translation System Using Verbal Semantic Attributes
Nakaiwa H., Ikehara S. (NTT)

Compound Nouns in a Unification-Based MT System
Bouillon P., Boesefeldt K., Russell G. (ISSCO)

XTAG - A Graphical Workbench for Developing Tree-Adjoining Grammars
Paraoubek P. (Institut Blaise Pascal), Schabes Y., Joshi A.K. (University of Pennsylvania)

15:45-16:45 Guest Speaker: **Norman Sondheimer** (General Electric)
Practical Natural Language Processing: Where have we been and where can we go?

VIDEO PROGRAM

A Demonstration of the "Circuit Fix-it Shoppe"
Hipp D.R., Smith R.W. (Duke University)

Speech Processing at BBN
Bates M.(BBN Systems and Technologies)

LILOG - Linguistics and Logic in Text Understanding
Bosch P., Pletat U., Wilms J.(IBM Germany)

The AlFresco Interactive System
Stock O. and the NLP Group (IRST)

KL-Magma 2: A Knowledge Representation System
Cappelli A.(Ist. Linguistica Computazionale - CNR)

TUTORIAL ABSTRACTS

The current status of Machine Translation Systems

Jun-ichi Tsujii, *Centre for Computational Linguistics, University of Manchester Institute of Science and Technology*

MT research has its own history largely independent from the main streams of Theoretical Linguistics (TL), Computational Linguistics (CL), and Natural Language Understanding (NLU) in Artificial Intelligence. However, the tutorial will emphasize the relevance of these fields to MT and will propose a unified view on MT problems. Problems in MT will be re-formulated and addressed in terms of the more general frameworks of TL, CL and NLU.

After briefly summarizing the history of MT, the tutorial will discuss how the concept of *translation equivalence* (TE) has been captured in the various frameworks of MT, such as Transfer and Interlingual approaches. A definition of TE will then be proposed and discussed in terms of some of the fundamental problems facing MT systems, such as (1) context dependency of translation, (2) lexical discrepancies among individual languages, (3) idiosyncratic structural correspondences, (4) knowledge-based processing in MT, (5) declarative formalisms for bi-lingual knowledge, and so on. Problems encountered by current commercially available MT systems will also be discussed. In particular, the adaptability of MT systems will be considered. New paradigms for MT, such as Statistic-based MT, Example-based MT, and Analogy-based MT will also be considered from the point of view of "adaptability".

Speech Recognition for Natural Language Processing Researchers

Renato DeMori, *School of Computer Science, McGill University*

The tutorial will cover a wide range of issues and topics within Speech Recognition including a brief review of the speech communication channel; speech processing and feature extraction; speech units and their models; Hidden Markov Models; unit training and their adaptation; connectionist models of speech recognition and some of the most important applications within the field, with a simple example of person/robot dialogue being treated in detail.

Some more specific topics will be covered including the following: an overview of language and dialogue models used for Automatic Speech Recognition and Understanding; Stochastic language models, their motivations, types, training and use; Stochastic grammars and parsers, and semantic analysis and dialogue models in a stochastic framework. There is also the possibility of interacting with demonstrations relating to applications in dictation and person/robot dialogue.

Evaluation of Natural Language Modalities

Sharon Oviatt and Philip Cohen, *Artificial Intelligence Center, SRI International*

The tutorial will present both empirical and computational issues relevant to the evaluation of different interactive natural language modalities. Basic evaluation goals and tools will be outlined for conducting both linguistic and performance assessments. Topics will include evaluation of relatively standard modalities, such as keyboard, speech, and handwriting (i.e., pen systems). In addition, the tutorial will present approaches to the assessment of more complex communication modalities that involve multimodal, multiparty, or multilingual interactions (e.g., interpreted spoken dialogues). The relevant literature and exemplary natural language systems will be discussed and critiqued. Whenever possible, both human-human and human-computer exchanges within different communication modalities will be compared. Participants will receive hands-on experience with the difficulties inherent in analyzing the relevant linguistic and behavioral data. Finally, the tutorial will identify future directions in language-oriented systems, as well as the dynamic evaluation techniques and strategies that will be needed to support their development.

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