

COLING-ACL '98

36th Annual Meeting of the
Association for Computational Linguistics

and

17th International Conference on
Computational Linguistics

Proceedings of the Conference

Volume I

August 10-14, 1998
Université de Montréal
Montreal, Quebec, Canada

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Preface: President of the ICCL

The volume attests to the great and growing vigor of our field by its size, the quality of the papers that it contains, and the tireless devotion of the people who put it together. The first International Conference on Computational Linguistics (it was not dubbed “Coling” for another four years) had no proceedings and neither did the earliest meetings of what was then the Association for Machine Translation and Computational Linguistics. In the approximately thirty-five intervening years, we have taken on the full panoply of academic respectability with departments and chairs in major universities, international conferences whose proceedings instantly become indispensable works of reference, workshops, special interest groups, tutorials and so forth. To you who have helped bring us where we are and show every intention of carrying us on to greater heights, I say thank you, and congratulations!

This meeting is the second Coling to be held in Canada, the first having been in 1976, and it is also the second combined International Conference on Computational Linguistics and Annual Meeting of the Association for Computational Linguistics, the first having been in Stanford, California, in 1984. The people who were fortunate enough to attend one or both of those meetings generally look back on them with fondness, and the people that contributed to their organization, with pride. This meeting will eclipse them both, thanks to the devoted efforts of countless people, but most notably Pierre Isabelle and Christian Boitet, and thanks to you, the writers, readers, reviewers, and presenters without whom it would not exist.

Martin Kay

Preface: President of the ACL

This volume may come as a surprise to regular participants of the annual ACL conferences. It is certainly more substantial in its weight and, hopefully, in its contents as well. While the former is chiefly the result of the extremely difficult and time-consuming efforts of the Program Committee, headed by Christian Boitet and Pete Whitelock, the latter derives from the participants themselves. The scientific level of any conference is determined not only by the value of the papers presented and included in the Proceedings, but also—and perhaps more importantly—by the liveliness and substantiveness of the discussions, in the lecture rooms and the corridors, the cafes and the restaurants . . .

Be that as it may, I feel confident that most participants will agree that it has been profitable for us to join forces once again (as we did in Stanford in 1984) and to hold a joint meeting of ACL and Coling. This belief is probably not shared at this time by the co-chairs of the PC, and perhaps even less by the conference organizer, Pierre Isabelle, whose life had been enormously complicated over the past year by the job of bringing so many computational linguists together in one place. I would like to express my deepest admiration and gratitude for all the work they have done in organizing this conference. I am convinced that after the fatigue wears off, even they will share with us the feeling of satisfaction and pleasure at having been part of a stimulating, fruitful and friendly meeting.

Eva Hajičová

Preface: Chair of the Organizing Committee

At the time of this writing, the Proceedings are just about to go to press. It is a thrilling moment for our Organizing Committee. All that work of ours was like setting the table for a grand meal. Now we can see that the food has been taken care of, and that it will be extremely abundant and diverse enough to please almost everyone's palate.

Since the inception of the COLING-ACL'98 project more than four years ago, the road has been long and full of surprises. As a case in point, it is interesting to note that while it was understood from the start that COLING-ACL'98 would be staged at the Université de Montréal, we had no idea then that our laboratory would (for independent reasons) become part of that university in the summer of 1997. Naturally, this particular development turned out to facilitate the project in many respects. More often, however, it was rather some unexpected complication that would pop up along the way. Each time, we would be led to wonder what kind of temporary madness had driven us to solicit the dubious privilege of doing all this organizational work.

Now that we can see the Proceedings and the complete scientific programme, we feel that our efforts are in fact being generously rewarded. I am glad we did take up the challenge to organize COLING-ACL'98 and I would like to thank the ICCL and the ACL for granting us their confidence.

However, if either one of these organizations (or worse the two of them together) should ever ask you to organize such a joint conference, my advice is that you should seriously think twice before accepting... You certainly cannot do it alone. One thing you should ask yourself is whether you will be able to get all the help you will need. Without a competent and truly dedicated team you don't stand a chance! Pray that you will be as lucky as I was: for it was truly a privilege to be able to work with such a resourceful and pleasant group as the people listed below.

Lyne Da Sylva	Machina Sapiens
Francis Fauteux	Informatique et recherche opérationnelle, Université de Montréal
Richard Kittredge	Linguistique et traduction, Université de Montréal
Guy Lapalme	Informatique et recherche opérationnelle, Université de Montréal
Marie-Claude L'Homme	Linguistique et traduction, Université de Montréal
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Alain Polguère	Linguistique et traduction, Université de Montréal
Graham Russell	RALI, Université de Montréal
Michel Simard	RALI, Université de Montréal
Alain Thériault	Linguistique et traduction, Université de Montréal

Pierre Isabelle
29 June 1998

Preface: Programme Committee Co-Chairs

Shortly after COLING'94, when it was decided to accept the proposal to hold COLING'98 in Montreal, Pierre Isabelle suggested to join it with ACL'98. ICCL and ACL agreed very soon and preparations began. It would be the second such joint event, the first having taken place 14 years ago, also in North America, at Stanford.

Since 1984, the NLP community has grown considerably, and a very large participation was expected. Also, the structure of COLINGs and ACL conferences had evolved differently, so that no existing model could be reused. To cut a long story short, it was finally agreed to: (1) set up a programme committee with an ICCL Chair (Christian Boitet, Grenoble) and an ACL Co-chair (Pete Whitelock, Oxford), (2) organize the event in 3 parts, tutorials, conference, and workshops, as in the last ACL/EACL'97 in Madrid, and (3) to assign the main responsibility of the conference part to Grenoble and that of the tutorials and workshops to Oxford.

The answers to the call for tutorial proposals were quite numerous and led to 11 interesting pre-conference tutorials.

The answer to the call for workshops proposal was also very successful, so that we had to extend from 1 to 2 days (Aug. 15 and 16) to accommodate one 2-day workshop and 10 1-day workshops: Very Large Corpora, Content Visualization and Intermedia Representations, Discourse Relations and Discourse Markers, Computational Terminology, Processing of Dependency-based Grammars, Computation of Phonological Constraints, Computational Treatment of Nominals, Translingual Information Management, Usage of WordNet in Natural Language Processing Systems, Computational Approaches to Semitic Languages, and Partially Automated Techniques for Transcribing Naturally Occurring, Continuous Speech.

As far as the conference is concerned, the e-mail submission process led to 640 announcements of submissions. We received 550 full papers, which were reviewed by about 320 reviewers organized in 17 subcommittees. Each paper was evaluated by 3 reviewers and sometimes also by the Subcommittee Chair or one of the Program Chairs. The advice of reviewers was synthesized by the Subcommittee Chairs, with the final evaluation and decision in the hands of the Programme Chairs. We read about 30% of the total submissions in order to resolve borderline cases and ensure consistency between subcommittees. We maintained a distinction between regular papers and project notes, reflecting the completeness of the work described. By restricting project notes in length, we were able to accept a much higher number of papers within the overall constraints of volume size. In the end, 137 regular papers and 96 project notes (33 with demos) were selected. Two regular papers later proposed also separate demos. No criteria other than scientific ones were applied. In particular, we did not try to reach any *a priori* fixed quotas for topics. Our community must be very grateful to all who participated in the review process and invested so much of their time and energy, in particular the subcommittee Chairs.

We also decided to invite 2 eminent researchers, David Sankoff from Udm and Changning Huang from Tsinghua University, to present papers on their on-going research, one at the border between NLP and mathematics, and the other in a very active part of NLP. Two interesting panels were also proposed by Antonio Zampolli and Nicoletta Calzolari.

Some remarks can be made at this point on the heterogeneity of papers relative to proposed topics, the state of our community relative to modern technology, and the blind review aspect of the selection process.

The 17 subcommittees were determined by ICCL and ACL in a fairly classical way, the detailed layout being intended to encourage evenly distributed submissions. Each submission had to indicate one or two topics, in order. It then came quite as a surprise to see that the repartition by first topics was extremely uneven, going from 9 to 107! To assign papers to subcommittees, the PC then

considered the second topics. Even then, only 70% of papers could be assigned to a subcommittee corresponding to one of their two selected topics. The PC had to take the titles and abstracts into consideration in making final assignments, some of which were in line with the topics and some not quite so. The PC therefore asked reviewers to evaluate papers with the whole set of topics in mind, rather than only those listed for their subcommittee. Subcommittee Chairs frequently asked new reviewers to join their subcommittee to evaluate papers outside of their initial domain, and the final result was quite satisfactory. However, a review process of this size is very complex, and the decision to accept or reject papers with contradicting evaluations is a difficult matter. Also, the subjective impression of overall quality of papers by subcommittee Chairs varied considerably. Nevertheless, the overall quality was felt to be quite high, and, with more space available in the programme, the PC would have liked to accept about 80 more papers. (These were actually put in a waiting list; however, almost no accepted paper was retracted).

On the technological aspect: for the first time in the history of COLINGs, it was decided to use e-mail intensively. That was not possible before, as COLING has always been very international and some countries did not have easy access to e-mail, although ACL has used it for a long time now. The same is actually still true of access to the Web. About 90% of those submitting papers understood the guidelines given in the call for papers and sent a correct and complete identification page in plain ASCII as required. The story of the submission proper is different. Paper versions were required, to avoid innumerable problems with formats, fonts, etc., and this was OK. But authors were also invited, again for the first time in the history of COLINGs and the nth time in that of ACLs, to send the same content as postscript or pdf files for backup purposes in case of postal problems during the review process. This led to an enormous workload and much disappointment for the PC, because (1) only 306 out of the 550 final papers were sent as files; (2) only 162 managed to produce correct files, and for 50% of those, only after sending 2 or 3 incorrect versions; (3) about 75% of authors (including some reviewers and subcommittee chairs) did not follow the guidelines and sent files containing the author names and affiliations, or produced files with bad names such as coling.ps or acl98.ps or Smith.ps instead of [#]idnumber.ps, or did not include the proper fonts, or included files in messages rather than attaching them. A further remark is that the vast majority of file-related problems came from North America, then Europe, and far behind Asia. In other words, our Asian colleagues did far better than all others, although they have many more problems linked with their writing systems.

Following the example of COLING-96 and ACL'97, the review process was blind. From the Programme Chairs' point of view, this innovation is questionable. First, it led to some of the problems mentioned above. Second, it seems often to miss the point, because authors don't succeed in hiding who they are: even people not knowledgeable in the field can almost always recognize the authors in a matter of seconds by looking at the reference list or scanning the paper for names of systems or formalisms. On the other hand, some papers for which authors were not evident got rejected or almost rejected (if the PC saved them) by reviewers who criticized the lack of reference to or comparison with previous work by the same authors!

In the future, it might prove interesting to abandon the idea of preparing a detailed partition into subcommittees a priori, and to use e-mail for building very quickly a series of subcommittees corresponding as tightly as possible to the submissions received. We also hope that the web will soon be available to all researchers in NLP in all countries, so that it can be used throughout the submission and reviewing process. Finally, we would like ICCL and ACL to study whether blind reviewing should be more strictly enforced, or dropped.

To conclude, we would like to say that this conference, with associated tutorials and workshops, promises to be at least as interesting as the previous ones, and to thank not only the members of the Programme Committee and all reviewers, but also all authors without whom the whole

exercise would have no point, and the Organizing Committee who helped the PC in many ways right from the start. Last but not least, to all participants: please don't forget that, although the written aspect of the conference is very important, direct communication and intense discussion are essential. New ideas often emerge only in such contexts. A third of the time allotted to each presentation should be used for discussions, and all the time between presentations, i.e. exactly 50% of our time in the University of Montreal!

Christian Boitet and Pete Whitelock
19 June 1998

Programme Committee and Reviewers by Subject Area

Morphology and phonology: Lauri Karttunen (chair), Evan Antworth, Susan Armstrong, Kenneth R. Beesley, Steven Bird, Igor Boguslavsky, Key-Sun Choi, Mark Ellison, Dafydd Gibbon, Jan Hajič, Julia Hirschberg, Yang Huizhong, Arvi Hurskainen, George Kiraz, Kimmo Koskenniemi, Mark Liberman, Kazunori Muraki, Kemal Oflazer, Richard Sproat, Bruce Tesar, Dan Tufis.

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Lexical resources and computational lexicography: Nicoletta Calzolari (chair), Amedeo Cappelletti, John Carroll, Gregory Grefenstette, Eduard Hovy, Nancy Ide, Kimmo Koskenniemi, Bente Maegaard, Simonetta Montemagni, Antoine Ogonowski, Martha Palmer, Maria Teresa Pazienza, Vito Pirrelli, James Pustejovsky, Philip Resnik.

Computational paradigms (symbolic, stochastic, neural, hybrid): Hozumi Tanaka (chair), John Carroll, Keh-Jiann Chen, Young S. Han, Hideki Hiraoka, Hidoshi Iida, Asanee Kawtrakul, Surapant Meknavin, Masaaki Nagata, Akitoshi Okumura, Keh-Yih Su, Takenobu Tokunaga.

Languages, tools and environments for lingware development: Rémi Zajac (chair), Jan Amtrup, Steve Beale, Hamish Cunningham, Alex Franz, Robert Gaizauskas, Udo Hahn, Doug Jones, Koiti Hasida, Hans-Ulrich Krieger, Yuji Matsumoto, Jun-Ichi Nakamura, Günter Neumann, Kemal Oflazer, Hiroshi Sano, Jörg Schutze, Tomek Strzalkowski, Leo Wanner.

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Summarization, abstraction, generation: Winfried Lenders (chair), Stephan Busemann, Tong Loong Cheong, Key-Sun Choi, Gnther Grz, Karin Harbusch, Roland Hausser, Eduard Hovy, Chu-Ren Huang, Tibor Kiss, Gerhard Knorz, Rainer Kuhlen, Inderjeet Mani, Dietmar Rösner, Karen Sparck-Jones, Manfred Stede, Harald Trost.

Text and speech machine translation and translation aids: Jun-Ichi Tsujii (chair), Sophia Ananiadou, Naoya Arakawa, Paul Bennett, Bill Black, Hans-Ulrich Block, Key-Sun Choi, Dominique Estival, Robert Frederking, Zhao-Ming Gao, Young S. Han, Chu-Ren Huang, Dosam Hwang, Hitoshi Iida, Hitoshi Isahara, Alon Lavie, Lori Levin, Jong-Hyeok Lee, Kim-Teng Lua, Yuji Matsumoto, Teruko Mitamura, Masaki Murata, Yoshiki Niwa, Eric Nyberg, Jaeduk Park, Hae-Chang Rim, Jungyun Seo, Harold Somers, Koichi Takeda, Hideki Tanaka, Kiyotaka Uchimoto, Takehito Utsuro, Eric M. Visser, Jin Yang, Akio Yokoo, Zaharin Yusoff, Min Zhang.

Multimodal NLP (speech and dialogue processing, integration of speech, text, gestures): Alex Waibel (chair), Lars Ahrenberg, E. Andre, Veronique Auberge, Gerard Bailly, Meera Blattner, Elizabeth O. Bratt, Jean Caelen, Noelle Carbonell, David N. Chin, Phil Cohen, John Dowding, Laurel Fais, Sakaoki Furui, Marsal Gavalda, Michael Johnston, Hasida Koiti, Akira Kurematsu, John Lafferty, Henry Lieberman, Jean-Francois Mari, Vibhu O. Mittal, Douglas B. Moran, Katashi Nagao, Sharon L. Oviatt, Thomas Polzin, Takenobu Takenaga, Ye-Yi Wang, Monika Woszczyna, Jie Yang.

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Small Scale Innovative Research Projects: Helmut Schnelle (chair), Peter Bosch, Daniel Flickinger, Simon Garrod, Christopher Habel, Megumi Kameyama, Marc Moens, Manfred Pinkal, Ronan G. Reilly, Remko Scha, Petr Sgall.

Others (contributions not falling in above categories): Eric Wehrli (chair), Marc Dymetman, Michael Hess, David Johnson, Andras Kornai, Paola Merlo, Jean-Yves Morin, Martin Rajman, Anne Reboul, Frédérique Segond, Pierre Zweigenbaum.

Additional reviewers: Kudo Ikuo, Alain Lecomte, Christian Rétoré, Noriyoshi Uratani.

Preface: Student Session Co-Chairs

The proceedings of COLING-ACL'98 wouldn't be complete without the extended abstracts of the students presenting their work in four special student sessions. Unlike the regular papers presented in the main session, students were encouraged to present work in progress that includes great ideas for future research.

We received 46 submissions from 12 countries. After thorough consideration, we accepted 12 of the submitted papers (or 26%). Each submission was reviewed by at least two student reviewers and two non-student reviewers.

We want to thank the 43 members of the program committee for being precise and fair in their assessments and for making our lives easier by returning all reviews on time.

The student members of the COLING-ACL 1998 Student Session Program Committee were Houssein Assadi, *EDF-DER, France*; Amit Bagga, *Duke University, USA*; Sarah Boyd, *MRI, Macquarie University, Australia*; Joyce Chai, *Duke University, USA*; Bart de Boer, *Vrije Universiteit Brussel, Belgium*; Christy Doran, *University of Pennsylvania, USA*; Mark Dras, *MRI, Macquarie University, Australia*; Philip Edmonds, *University of Toronto, Canada*; Daqing He, *University of Edinburgh, Scotland, UK*; Pamela Jordan, *University of Pittsburgh, USA*; Esther Klabbbers, *Technical University Eindhoven, The Netherlands*; Nobo Komagata, *University of Pennsylvania, USA*; Daniel Loehr, *The MITRE Corporation, USA*; Nuno Marques, *Universidade Nova de Lisboa, Portugal*; Maite Taboada, *Universidad Complutense de Madrid, Spain*; Mariet Theune, *IPO, The Netherlands*; Laura Tomokiyo, *Carnegie Mellon University, USA*; Meltem Turhan, *Middle East Technical University, Turkey*; Jakub Zavrel, *Tilburg University, The Netherlands*.

The following were the non-student members of the committee: Ion Androutsopoulos, *NCSR "Demokritos", Athens, Greece*; Maria Aretoulaki, *University of Erlangen, Germany*; Kim Binsted, *Sony, Japan*; Ido Dagan, *Bar-Ilan University, Israel*; Barbara Di Eugenio, *University of Pittsburgh, USA*; Mark Ellison, *University of Edinburgh, Scotland*; Dominique Estival, *University of Melbourne, Australia*; Eva Hajicova, *Charles University, Czech Republic*; Steve Green, *MRI, Macquarie University, Australia*; Dekang Lin, *University of Manitoba, Canada*; Karen Lochbaum, *US WEST Advanced Technologies, USA*; Mehryar Mohri, *AT&T Labs - Research, USA*; Cecile Paris, *CSIRO, Australia*; Scott Prevost, *FX Palo Alto Laboratory, Inc, USA*; Ehud Reiter, *University of Aberdeen, Scotland*; Ellen Riloff, *University of Utah, USA*; Eric Siegel, *Columbia University, USA*; Harold Somers, *UMIST, Manchester, UK*; Bangalore Srinivas, *AT&T Labs - Research, USA*; Evelyne Tzoukermann, *Bell Labs, USA*; Renata Vieira, *University of Edinburgh, Scotland*; Marilyn Walker, *AT&T Labs - Research, USA*; David Weir, *University of Sussex, UK*; Dekai Wu, *Hong Kong University of Science and Technology, Hong Kong*.

We want to thank last year's organizers: Pamela Jordan, *University of Pittsburgh, USA* and Johan Bos, *University of the Saarland* for their help and for providing us with a large volume of supporting materials that made it possible to handle the organization of this year's Student Session. Finally, we want to thank the organizers of the main conference from ICCL and the ACL Executive Committee, more specifically Pierre Isabelle, Christian Boitet, Pete Whitelock, and Kathy McCoy.

Student Session Co-Chairs:

Maria Milosavljevic, *CSIRO, Australia*

Dragomir R. Radev, *Columbia University, USA*

Table of Contents

COLING-ACL'98 Sponsors	i
Preface: President of the ICCL	ii
Preface: President of the ACL	ii
Preface: Chair of the Organizing Committee	iii
Preface: Programme Committee Co-Chairs	iv
Programme Committee and Reviewers by Subject Area	vi
Preface: Student Session Co-Chairs	viii
Table of Contents	ix
Author Index	xxi

Invited Papers

Zhao Jun and Huang Changning <i>A Quasi-Dependency Model for the Structural Analysis of Chinese BaseNPs</i>	1
David Sankoff <i>The Production of Code-Mixed Discourse</i>	8

Regular Papers and Project Notes

Eneko Agirre, Koldo Gojenola, Kepa Sarasola and Atro Voutilainen <i>Towards a Single Proposal in Spelling Correction</i>	22
Lars Ahrenberg, Mikael Andersson and Magnus Merkel <i>A Simple Hybrid Aligner for Generating Lexical Correspondences in Parallel Texts</i>	29
Mohammad Akbar and Jean Caelen <i>Parole et traduction automatique: le module de reconnaissance RAPHAEL</i>	36
Hiyan Alshawi, Srinivas Bangalore and Shona Douglas <i>Automatic Acquisition of Hierarchical Transduction Models for Machine Translation</i>	41
Pascal Amsili and Corinne Rossari <i>Tense and Connective Constraints on the Expression of Causality</i>	48
Jan W. Amtrup and Volker Weber <i>Time Mapping with Hypergraphs</i>	55
Chinatsu Aone, Mary Ellen Okurowski and James Gorlinsky <i>Trainable, Scalable Summarization Using Robust NLP and Machine Learning</i>	62
Shlomo Argamon, Ido Dagan and Yuval Krymolowski <i>A Memory-Based Approach to Learning Shallow Natural Language Patterns</i>	67
Saliha Azzam, Kevin Humphreys and Robert Gaizauskas <i>Evaluating a Focus-Based Approach to Anaphora Resolution</i>	74
Amit Bagga and Breck Baldwin <i>Entity-Based Cross-Document Coreferencing Using the Vector Space Model</i>	79
Collin F. Baker, Charles J. Fillmore and John B. Lowe <i>The Berkeley FrameNet Project</i>	86
Petra Barg and Markus Walther <i>Processing Unknown Words in HPSG</i>	91
Ken Barker and Stan Szpakowicz <i>Semi-Automatic Recognition of Noun Modifier Relationships</i>	96
Caroline Barrière <i>Redundancy: Helping Semantic Disambiguation</i>	103

Tilman Becker, Wolfgang Finkler, Anne Kilger and Peter Poller	
<i>An Efficient Kernel for Multilingual Generation in Speech-to-Speech Dialogue Translation</i>	110
Kenneth R. Beesley	
<i>Consonant Spreading in Arabic Stems</i>	117
Philippe Blache	
<i>Parsing Ambiguous Structures using Controlled Disjunctions and Unary Quasi-Trees</i> . . .	124
Ezra Black, Andrew Finch and Hideki Kashioka	
<i>Trigger-Pair Predictors in Parsing and Tagging</i>	131
Rens Bod	
<i>Spoken Dialogue Interpretation with the DOP Model</i>	138
Rens Bod and Ronald Kaplan	
<i>A Probabilistic Corpus-Driven Model for Lexical-Functional Analysis</i>	145
Francis Bond, Daniela Kurz and Satoshi Shirai	
<i>Anchoring Floating Quantifiers in Japanese-to-English Machine Translation</i>	152
Johan Bos, C.J. Rupp, Bianka Buschbeck-Wolf and Michael Dorna	
<i>Managing Information at Linguistic Interfaces</i>	160
Cem Bozsahin	
<i>Deriving the Predicate-Argument Structure for a Free Word Order Language</i>	167
Norbert Bröker	
<i>Separating Surface Order and Syntactic Relations in a Dependency Grammar</i>	174
António Branco	
<i>The Logical Structure of Binding</i>	181
Eric Brill, Radu Florian, John C. Henderson and Lidia Mangu	
<i>Beyond N-Grams: Can Linguistic Sophistication Improve Language Modeling?</i>	186
Eric Brill and Jun Wu	
<i>Classifier Combination for Improved Lexical Disambiguation</i>	191
Caroline Brun	
<i>Terminology Finite-state Preprocessing for Computational LFG</i>	196
John D. Burger, David Palmer and Lynette Hirschman	
<i>Named Entity Scoring for Speech Input</i>	201
Jill Burstein, Karen Kukich, Susanne Wolff, Chi Lu, Martin Chodorow, Lisa Braden-Harder and Mary Dee Harris	
<i>Automated Scoring Using A Hybrid Feature Identification Technique</i>	206
Marie-Hélène Candito	
<i>Building Parallel LTAG for French and Italian</i>	211
Claire Cardie and David Pierce	
<i>Error-Driven Pruning of Treebank Grammars for Base Noun Phrase Identification</i>	218
Ciprian Chelba and Frederick Jelinek	
<i>Exploiting Syntactic Structure for Language Modeling</i>	225
Hsin-Hsi Chen, Sheng-Jie Huang, Yung-Wei Ding and Shih-Chung Tsai	
<i>Proper Name Translation in Cross-Language Information Retrieval</i>	232
Jen Nan Chen and Jason S. Chang	
<i>A Concept-based Adaptive Approach to Word Sense Disambiguation</i>	237
Keh-Jiann Chen, Wen Tsuei and Lee-Feng Chien	
<i>PAT-Trees with the Deletion Function as the Learning Device for Linguistic Patterns</i> . .	244

Sung-Kwon Choi, Han-Min Jung, Chul-Min Sim, Taewan Kim, Dong-In Park, Jun-Sik Park and Key-Sun Choi <i>Hybrid Approaches to Improvement of Translation Quality in Web-based English-Korean Machine Translation</i>	251
Jennifer Chu-Carroll and Bob Carpenter <i>Dialogue Management in Vector-Based Call Routing</i>	256
Nigel Collier, Hideki Hiraakawa and Akira Kumano <i>Machine Translation vs. Dictionary Term Translation — a Comparison for English-Japanese News Article Alignment</i>	263
Nigel Collier, Kenji Ono and Hideki Hiraakawa <i>An Experiment in Hybrid Dictionary and Statistical Sentence Alignment</i>	268
Michael A. Covington <i>Alignment of Multiple Languages for Historical Comparison</i>	275
Dan Cristea, Nancy Ide and Laurent Romary <i>Veins Theory: A Model of Global Discourse Cohesion and Coherence</i>	281
Alessandro Cucchiarelli, Danilo Luzi and Paola Velardi <i>Automatic Semantic Tagging of Unknown Proper Names</i>	286
Hoa Trang Dang, Karin Kipper, Martha Palmer and Joseph Rosenzweig <i>Investigating Regular Sense Extensions based on Intersective Levin Classes</i>	293
Sabine Deligne and Yoshinori Sagisaka <i>Learning a Syntagmatic and Paradigmatic Structure from Language Data with a Bi-Multigram Model</i>	300
Sylvain Delisle, Sylvain Létourneau and Stan Matwin <i>Experiments with Learning Parsing Heuristics</i>	307
Ludmila Dimitrova, Tomaz Erjavec, Nancy Ide, Heiki Jaan Kaalep, Vladimir Petkevic and Dan Tufis <i>Multext-East: Parallel and Comparable Corpora and Lexicons for Six Central and Eastern European Languages</i>	315
Luca Dini, Vittorio Di Tomaso and Frédérique Segond <i>Error Driven Word Sense Disambiguation</i>	320
Barbara Di Eugenio, Pamela W. Jordan, Johanna D. Moore and Richmond H. Thomason <i>An Empirical Investigation of Proposals in Collaborative Dialogues</i>	325
Hai Doan-Nguyen <i>Accumulation of Lexical Sets: Acquisition of Dictionary Resources and Production of New Lexical Sets</i>	330
Shinichi Doi, Shin-ichiro Kamei and Kiyoshi Yamabana <i>A Text Input Front-end Processor as an Information Access Platform</i>	336
Michael Dorna, Anette Frank, Josef van Genabith and Martin C. Emele <i>Syntactic and Semantic Transfer with F-Structures</i>	341
Marc Dymetman <i>Group Theory and Linguistic Processing</i>	348
Markus Egg, Joachim Niehren, Peter Ruhrberg and Feiyu Xu <i>Constraints over Lambda-Structures in Semantic Underspecification</i>	353
Mohammad Ali Elmi and Martha Evens <i>Spelling Correction using Context</i>	360
Martin C. Emele and Michael Dorna <i>Ambiguity Preserving Machine Translation using Packed Representations</i>	365

Roger Evans and David Weir	
<i>A Structure-sharing Parser for Lexicalized Grammars</i>	372
N. Ezeiza , I. Alegria, J.M. Arriola, R. Urizar and I. Aduriz	
<i>Combining Stochastic and Rule-Based Methods for Disambiguation in Agglutinative Languages</i>	379
Antonio Ferrández, Manuel Palomar and Lidia Moreno	
<i>Anaphor Resolution In Unrestricted Texts With Partial Parsing</i>	385
Olivier Ferret, Brigitte Grau and Nicolas Masson	
<i>Thematic Segmentation of Texts: Two Methods for Two Kind of Texts</i>	392
Sharon Flank	
<i>A Layered Approach to NLP-Based Information Retrieval</i>	397
Dayne Freitag	
<i>Toward General-Purpose Learning for Information Extraction</i>	404
Takeshi Fuchi and Shinichiro Takagi	
<i>Japanese Morphological Analyzer using Word Co-occurrence — JTAG</i>	409
Pascale Fung and Lo Yuen Yee	
<i>An IR Approach for Translating New Words from Nonparallel, Comparable Texts</i>	414
Osamu Furuse, Setsuo Yamada and Kazuhide Yamamoto	
<i>Splitting Long or Ill-formed Input for Robust Spoken-language Translation</i>	421
Susanne Gahl	
<i>Automatic Extraction of Subcorpora based on Subcategorization Frames from a Part-of-Speech Tagged Corpus</i>	428
Björn Gambäck and Johan Bos	
<i>Semantic-Head Based Resolution of Scopal Ambiguities</i>	433
Bilel Gargouri, Abdelmajid Ben Hamadou and Mohamed Jmaiel	
<i>Vers l'utilisation des méthodes formelles pour le développement de linguiciels</i>	438
Éric Gaussier	
<i>Flow Network Models for Word Alignment and Terminology Extraction from Bilingual Corpora</i>	444
Marsal Gavaldà and Alex Waibel	
<i>Growing Semantic Grammars</i>	451
Jin Guo	
<i>One Tokenization per Source</i>	457
Vineet Gupta and John Lamping	
<i>Efficient Linear Logic Meaning Assembly</i>	464
Pius ten Hacken and Stephan Bopp	
<i>Separable Verbs in a Reusable Morphological Dictionary for German</i>	471
Udo Hahn and Klemens Schnattinger	
<i>A Text Understander that Learns</i>	476
Jan Hajič and Barbora Hladká	
<i>Tagging Inflective Languages: Prediction of Morphological Categories for a Rich Structured Tagset</i>	483
Hans van Halteren, Jakub Zavrel and Walter Daelemans	
<i>Improving Data Driven Wordclass Tagging by System Combination</i>	491
Thierry Hamon, Adeline Nazarenko and Cécile Gros	
<i>A Step towards the Detection of Semantic Variants of Terms in Technical Documents</i>	498
Masahiko Haruno, Satoshi Shirai and Yoshifumi Ooyama	
<i>Using Decision Trees to Construct a Practical Parser</i>	505

Terrence Harvey and Sandra Carberry	
<i>Integrating Text Plans for Conciseness and Coherence</i>	512
Julia E. Heine	
<i>Definiteness Predictions for Japanese Noun Phrases</i>	519
Johannes Heinecke, Jürgen Kunze, Wolfgang Menzel and Ingo Schröder	
<i>Eliminative Parsing with Graded Constraints</i>	526
James Henderson and Peter Lane	
<i>A Connectionist Architecture for Learning to Parse</i>	531
Mark Hepple	
<i>Memoisation for Glue Language Deduction and Categorical Parsing</i>	538
Derrick Higgins	
<i>Parsing Parallel Grammatical Representations</i>	545
Janet Hitzeman and Massimo Poesio	
<i>Long Distance Pronominalisation and Global Focus</i>	550
Rebecca Hwa	
<i>An Empirical Evaluation of Probabilistic Lexicalized Tree Insertion Grammars</i>	557
Fidelia Ibekwe-SanJuan	
<i>Terminological Variation, a Means of Identifying Research Topics from Texts</i>	564
Takahiro Ikeda, Akitoshi Okumura and Kazunori Muraki	
<i>Information Classification and Navigation based on 5W1H of the Target Information</i> . . .	571
Michael Ingleby and Wiebke Brockhaus	
<i>A Concurrent Approach to the Automatic Extraction of Subsegmental Primes and Phonological Constituents from Speech</i>	578
Masato Ishizaki and Tsuneaki Kato	
<i>Exploring the Characteristics of Multi-party Dialogues</i>	583
Arne Jönsson and Lena Strömbäck	
<i>Robust Interaction through Partial Interpretation and Dialogue Management</i>	590
Christian Jacquemin	
<i>Improving Automatic Indexing through Concept Combination and Term Enrichment</i> . . .	595
Donghong Ji, Junping Gong and Changning Huang	
<i>Combining a Chinese Thesaurus with a Chinese Dictionary</i>	600
Hongyan Jing and Kathleen McKeown	
<i>Combining Multiple, Large-Scale Resources in a Reusable Lexicon for Natural Language Generation</i>	607
Amanda C. Jobbins and Lindsay J. Evett	
<i>Text Segmentation Using Reiteration and Collocation</i>	614
Mark Johnson	
<i>Finite-state Approximation of Constraint-based Grammars using Left-corner Grammar Transforms</i>	619
Michael Johnston	
<i>Unification-based Multimodal Parsing</i>	624
Kristiina Jokinen, Hideki Tanaka and Akio Yokoo	
<i>Context Management with Topics for Spoken Dialogue Systems</i>	631
Kyo Kageura	
<i>A Statistical Analysis of Morphemes in Japanese Terminology</i>	638
Sylvain Kahane, Alexis Nasr and Owen Rambow	
<i>Pseudo-Projectivity: A Polynomially Parsable Non-Projective Dependency Grammar</i> . . .	646

Satoshi Kaki, Eiichiro Sumita and Hitoshi Iida	
<i>A Method for Correcting Errors in Speech Recognition using the Statistical Features of Character Co-occurrence</i>	653
Hideki Kashioka, Yasuhiro Kawata, Yumiko Kinjo, Andrew Finch and Ezra W. Black	
<i>Use of Mutual Information Based Character Clusters in Dictionary-less Morphological Analysis of Japanese</i>	658
Robert T. Kasper, Mike Calcagno and Paul C. Davis	
<i>Know When to Hold 'Em: Shuffling Deterministically in a Parser for Nonconcatenative Grammars</i>	663
Genichiro Kikui	
<i>Term-list Translation using Mono-lingual Word Co-occurrence Vectors</i>	670
Byeongchang Kim, WonIl Lee, Geunbae Lee and Jong-Hyeok Lee	
<i>Unlimited Vocabulary Grapheme to Phoneme Conversion for Korean TTS</i>	675
Judith L. Klavans and Min-Yen Kan	
<i>The Role of Verbs in Document Analysis</i>	680
Tang Enya Kong and Mosleh Hmoud Al-Adhaileh	
<i>A Flexible Example-Based Parser Based on the SSTC</i>	687
Yasuo Koyama, Masako Yasutake, Kenji Yoshimura and Kosho Shudo	
<i>Large Scale Collocation Data and Their Application to Japanese Word Processor Technology</i>	694
Alexander Krotov, Mark Hepple, Robert Gaizauskas and Yorick Wilks	
<i>Compacting the Penn Treebank Grammar</i>	699
Irene Langkilde and Kevin Knight	
<i>Generation that Exploits Corpus-Based Statistical Knowledge</i>	704
Philippe Langlais, Michel Simard and Jean Véronis	
<i>Methods and Practical Issues in Evaluating Alignment Techniques</i>	711
Benoit Lavoie and Owen Rambow	
<i>A Framework for Customizable Generation of Hypertext Presentations</i>	718
Seungmi Lee and Key-Sun Choi	
<i>Automatic Acquisition of Language Model based on Head-Dependent Relation between Words</i>	723
Yves Lepage	
<i>Solving analogies on words: an algorithm</i>	728
Gina-Anne Levow	
<i>Characterizing and Recognizing Spoken Corrections in Human-Computer Dialogue</i>	736
Wolfgang Lezius, Reinhard Rapp and Manfred Wetzler	
<i>A Freely Available Morphological Analyzer, Disambiguator and Context Sensitive Lemmatizer for German</i>	743
Hang Li and Naoki Abe	
<i>Word Clustering and Disambiguation Based on Co-occurrence Data</i>	749
Hui-Feng Li, Jong-Hyeok Lee and Geunbae Lee	
<i>Identifying Syntactic Role of Antecedent in Korean Relative Clause using Corpus and Thesaurus Information</i>	756
Li Li, Deborah A. Dahl, Lewis M. Norton, Marcia C. Linebarger and Dongdong Chen	
<i>A Test Environment for Natural Language Understanding Systems</i>	763
Dekang Lin	
<i>Automatic Retrieval and Clustering of Similar Words</i>	768

Nikolaj Lindberg and Martin Eineborg	
<i>Learning Constraint Grammar-style Disambiguation Rules using Inductive Logic Programming</i>	775
Diane J. Litman, Shimei Pan and Marilyn A. Walker	
<i>Evaluating Response Strategies in a Web-Based Spoken Dialogue Agent</i>	780
Vincenzo Lombardo and Leonardo Lesmo	
<i>Formal Aspects and Parsing Issues of Dependency Theory</i>	787
Susann LuperFoy, Dan Loehr, David Duff, Keith Miller, Florence Reeder and Lisa Harper	
<i>An Architecture for Dialogue Management, Context Tracking, and Pragmatic Adaptation in Spoken Dialogue Systems</i>	794
Qing Ma and Hitoshi Isahara	
<i>A Multi-Neuro Tagger Using Variable Lengths of Contexts</i>	802
Takaki Makino, Minoru Yoshida, Kentaro Torisawa and Jun'ichi Tsujii	
<i>LiLFeS — Towards a Practical HPSG Parser</i>	807
Raquel Martínez, Joseba Abaitua and Arantza Casillas	
<i>Bitext Correspondences through Rich Mark-up</i>	812
Mark T. Maybury	
<i>Discourse Cues for Broadcast News Segmentation</i>	819
David R. McGee, Phil R. Cohen and Sharon Oviatt	
<i>Confirmation in Multimodal Systems</i>	823
Angus McIntyre	
<i>Babel: A Testbed for Research in Origins of Language</i>	830
Surapant Meknavin, Boonserm Kijsirikul, Ananlada Chotimongkol and Cholwich Nuttee	
<i>Combining Trigram and Winnow in Thai OCR Error Correction</i>	836
Adam Meyers, Roman Yangarber, Ralph Grishman, Catherine Macleod and Antonio Moreno-Sandoval	
<i>Deriving Transfer Rules from Dominance-Preserving Alignments</i>	843
Andrei Mikheev	
<i>Feature Lattices for Maximum Entropy Modelling</i>	848
Hideki Mima, Hitoshi Iida and Osamu Furuse	
<i>Simultaneous Interpretation Utilizing Example-based Incremental Transfer</i>	855
Kyongho Min and William H. Wilson	
<i>Integrated Control of Chart Items for Error Repair</i>	862
Ruslan Mitkov	
<i>Robust Pronoun Resolution with Limited Knowledge</i>	869
Yutaka Mitsuishi, Kentaro Torisawa and Jun'ichi Tsujii	
<i>HPSG-Style Underspecified Japanese Grammar with Wide Coverage</i>	876
Hajime Mochizuki, Takeo Honda and Manabu Okumura	
<i>Text Segmentation with Multiple Surface Linguistic Cues</i>	881
Chadia Moghrabi	
<i>Using Language Resources in an Intelligent Tutoring System for French</i>	886
Mehryar Mohri and Fernando C.N. Pereira	
<i>Dynamic Compilation of Weighted Context-Free Grammars</i>	891
Shinsuke Mori and Makoto Nagao	
<i>A Stochastic Language Model using Dependency and its Improvement by Word Clustering</i>	898
Pascal Mouret and Monique Rolbert	
<i>Dealing with Distinguishing Descriptions in a Guided Composition System</i>	905

Masaki Murata and Makoto Nagao	
<i>An Estimate of Referent of Noun Phrases in Japanese Sentences</i>	912
Katashi Nagao and Kôiti Hasida	
<i>Automatic Text Summarization Based on the Global Document Annotation</i>	917
Masaaki Nagata	
<i>Japanese OCR Error Correction using Character Shape Similarity and Statistical Language Model</i>	922
Hiroshi Nakagawa, Tatsunori Mori, Nobuyuki Omori and Jun Okamura	
<i>Hypertext Authoring for Linking Relevant Segments of Related Instruction Manuals</i>	929
Mikio Nakano and Akira Shimazu	
<i>Translating a Unification Grammar with Disjunctions into Logical Constraints</i>	934
Christine H. Nakatani	
<i>Constituent-based Accent Prediction</i>	939
Mark-Jan Nederhof	
<i>An Alternative LR Algorithm for TAGs</i>	946
Mark-Jan Nederhof, Anoop Sarkar and Giorgio Satta	
<i>Prefix Probabilities from Stochastic Tree Adjoining Grammars</i>	953
S. Nießen, S. Vogel, H. Ney and C. Tillmann	
<i>A DP based Search Algorithm for Statistical Machine Translation</i>	960
Takashi Ninomiya, Kentaro Torisawa and Jun'ichi Tsujii	
<i>An Efficient Parallel Substrate for Typed Feature Structures on Shared Memory Parallel Machines</i>	968
Sergei Nirenburg and Victor Raskin	
<i>Universal Grammar and Lexis for Quick Ramp-Up of MT Systems</i>	975
Lewis M. Norton, Deborah A. Dahl, Li Li and Katherine P. Beals	
<i>Integration of Large-Scale Linguistic Resources in a Natural Language Understanding System</i>	980
Franz Josef Och and Hans Weber	
<i>Improving Statistical Natural Language Translation with Categories and Rules</i>	985
Akira Oishi and Yuji Matsumoto	
<i>Recognition of the Coherence Relation between Te-linked Clauses</i>	990
Lluís Padró and Lluís Marquez	
<i>On the Evaluation and Comparison of Taggers: the Effect of Noise in Testing Corpora</i> .	997
Shimei Pan and Kathleen McKeown	
<i>Learning Intonation Rules for Concept to Speech Generation</i>	1003
Ivandr�e Paraboni and Vera L�ucia Strube de Lima	
<i>Possessive Pronominal Anaphor Resolution in Portuguese Written Texts</i>	1010
Junsik Park, Jung-Goo Kang, Wook Hur and Key-Sun Choi	
<i>Machine Aided Error-Correction Environment for Korean Morphological Analysis and Part-of-Speech Tagging</i>	1015
David Pautler and Alex Quilici	
<i>A Computational Model of Social Perlocutions</i>	1020
Gerald Penn	
<i>Parametric Types for Typed Attribute-Value Logic</i>	1027
Vladimir Pericliev and Ra�ul E. Vald�es-P�erez	
<i>A Procedure for Multi-Class Discrimination and some Linguistic Applications</i>	1034
Hannes Pirker, Georg Niklfeld, Johannes Matiasek and Harald Trost	
<i>From Information Structure to Intonation: A Phonological Interface for Concept-to-Speech</i>	1041

Andrei Popescu-Belis, Isabelle Robba and Gérard Sabah	
<i>Reference Resolution beyond Coreference: a Conceptual Frame and its Application</i>	1046
Richard Power and Donia Scott	
<i>Multilingual Authoring using Feedback Texts</i>	1053
Victor Poznanski, Pete Whitelock, Jan IJdens and Steffan Corley	
<i>Practical Glossing by Prioritised Tiling</i>	1060
Gábor Prózszék	
<i>An Intelligent Multi-Dictionary Environment</i>	1067
Dragomir R. Radev	
<i>Learning Correlations between Linguistic Indicators and Semantic Constraints: Reuse of</i> <i>Context-Dependent Descriptions of Entities</i>	1072
Adwait Ratnaparkhi	
<i>Statistical Models for Unsupervised Prepositional Phrase Attachment</i>	1079
Tim Read and Elena Barcena	
<i>JaBot: A Multilingual Java-Based Intelligent Agent for Web Sites</i>	1086
Chris Reed and Derek Long	
<i>Generating the Structure of Argument</i>	1091
Stephen D. Richardson, William B. Dolan and Lucy Vanderwende	
<i>MindNet: Acquiring and Structuring Semantic Information from Text</i>	1098
German Rigau, Horacio Rodríguez and Eneko Agirre	
<i>Building Accurate Semantic Taxonomies from Monolingual MRDs</i>	1103
Brian Roark and Eugene Charniak	
<i>Noun-Phrase Co-occurrence Statistics for Semi-Automatic Semantic Lexicon Construction</i>	1110
James Rogers	
<i>A Descriptive Characterization of Tree-Adjoining Languages</i>	1117
Douglas Roland and Daniel Jurafsky	
<i>How Verb Subcategorization Frequencies are Affected by Corpus Choice</i>	1122
Carolyn Penstein Rosé and Lori S. Levin	
<i>An Interactive Domain Independent Approach to Robust Dialogue Interpretation</i>	1129
Dan Roth and Dmitry Zelenko	
<i>Part of Speech Tagging Using a Network of Linear Separators</i>	1136
Patrick Saint-Dizier	
<i>A Generative Lexicon Perspective for Adjectival Modification</i>	1143
Ken Samuel, Sandra Carberry and K. Vijay-Shanker	
<i>Dialogue Act Tagging with Transformation-Based Learning</i>	1150
Antonio Sanfilippo	
<i>Ranking Text Units According to Textual Saliency, Connectivity and Topic Aptness</i>	1157
Anoop Sarkar	
<i>Conditions on Consistency of Probabilistic Tree Adjoining Grammars</i>	1164
Kengo Sato and Masakazu Nakanishi	
<i>Maximum Entropy Model Learning of the Translation Rules</i>	1171
Giorgio Satta and William Schuler	
<i>Restrictions on Tree Adjoining Languages</i>	1176
Michael Schiehlen	
<i>Learning Tense Translation from Bilingual Corpora</i>	1183
Frank Schilder	
<i>An Underspecified Segmented Discourse Representation Theory (USDRT)</i>	1188

Paul Schmid, Marius Groenendijk, Peter Phelan, Henrik Schulz, Sibylle Rieder, Axel Theofilidis, Thierry Declerck and Andrew Bredenkamp	
<i>Natural Language Access to Software Applications</i>	1193
David Schneider and Kathleen F. McCoy	
<i>Recognizing Syntactic Errors in the Writing of Second Language Learners</i>	1198
Mark Seligman, Christian Boitet and Boubaker Meddeb-Hamrouni	
<i>Transforming Lattices into Non-deterministic Automata with Optional Null Arcs</i>	1205
Jean Senellart	
<i>Locating Noun Phrases with Finite State Transducers</i>	1212
James Shaw	
<i>Segregatory Coordination and Ellipsis in Text Generation</i>	1220
Harold L. Somers	
<i>Similarity Metrics for Aligning Children's Articulation Data</i>	1227
Josep M. Sopena, Agusti LLoberas and Joan L. Moliner	
<i>A Connectionist Approach to Prepositional Phrase Attachment for Real World Texts</i> . . .	1233
Manfred Stede and Carla Umbach	
<i>DiMLex: A Lexicon of Discourse Markers for Text Generation and Understanding</i>	1238
Luc Steels and Frédéric Kaplan	
<i>Spontaneous Lexicon Change</i>	1243
Michael Strube	
<i>Never Look Back: An Alternative to Centering</i>	1251
Tomek Strzalkowski, Jin Wang and Bowden Wise	
<i>Summarization-based Query Expansion in Information Retrieval</i>	1258
Maosong Sun, Dayang Shen and Benjamin K. Tsou	
<i>Chinese Word Segmentation without Using Lexicon and Hand-crafted Training Data</i> . . .	1265
Yoshimi Suzuki, Fumiyo Fukumoto and Yoshihiro Sekiguchi	
<i>Keyword Extraction using Term-Domain Interdependence for Dictation of Radio News</i> .	1272
Gökhan Tür and Kemal Oflazer	
<i>Tagging English by Path Voting Constraints</i>	1277
Kumiko Tanaka-Ishii, Kôiti Hasida and Itsuki Noda	
<i>Reactive Content Selection in the Generation of Real-time Soccer Commentary</i>	1282
Pasi Tapanainen, Jussi Piitulainen and Timo Järvinen	
<i>Idiomatic Object Usage and Support Verbs</i>	1289
Heike Tappe and Frank Schilder	
<i>Coherence in Spoken Discourse</i>	1294
Davide Turcato	
<i>Automatically Creating Bilingual Lexicons for Machine Translation from Bilingual Text</i> .	1299
Naohiko Uramoto and Koichi Takeda	
<i>A Method for Relating Multiple Newspaper Articles by Using Graphs, and Its Application to Webcasting</i>	1307
Takehito Utsuro, Takashi Miyata and Yuji Matsumoto	
<i>General-to-Specific Model Selection for Subcategorization Preference</i>	1314
Evelyne Viegas	
<i>Multilingual Computational Semantic Lexicons in Action: The WYSINNWYG Approach to NLP</i>	1321
Evelyne Viegas, Stephen Beale and Sergei Nirenburg	
<i>The Computational Lexical Semantics of Syntagmatic Expressions</i>	1328

Eric Villemonte de la Clergerie and Miguel Alonso Pardo	
<i>A Tabular Interpretation of a Class of 2-Stack Automata</i>	1333
Takahiro Wakao, Terumasa Ehara, Eiji Sawamura, Ichiro Maruyama and Katsuhiko Shirai	
<i>Project for Production of Closed-Caption TV Programs for the Hearing Impaired</i>	1340
Marilyn A. Walker, Jeanne C. Fromer and Shrikanth Narayanan	
<i>Learning Optimal Dialogue Strategies: A Case Study of a Spoken Dialogue Agent for Email</i>	1345
Stephen Wan and Cornelia Maria Verspoor	
<i>Automatic English-Chinese Name Transliteration for Development of Multilingual Lexical Resources</i>	1352
Ye-Yi Wang and Alex Waibel	
<i>Modeling with Structures in Statistical Machine Translation</i>	1357
Mark Wasson	
<i>Using Leading Text for News Summaries: Evaluation Results and Implications for Commercial Summarization Applications</i>	1364
Hideo Watanabe and Koichi Takeda	
<i>A Pattern-based Machine Translation System Extended by Example-based Processing</i> . . .	1369
Yasuhiko Watanabe and Makoto Nagao	
<i>Diagram Understanding Using Integration of Layout Information and Textual Information</i>	1374
Yasuhiko Watanabe, Yoshihiro Okada, Kengo Kaneji and Makoto Nagao	
<i>Aligning Articles in TV Newscasts and Newspapers</i>	1381
Eric Wehrli	
<i>Translating Idioms</i>	1388
Graham Wilcock and Yuji Matsumoto	
<i>Head-Driven Generation with HPSG</i>	1393
Yorick Wilks and Mark Stevenson	
<i>Word Sense Disambiguation using Optimised Combinations of Knowledge Sources</i>	1398
Karsten L. Worm	
<i>A Model for Robust Processing of Spontaneous Speech by Integrating Viable Fragments</i> .	1403
Dekai Wu and Hongsing Wong	
<i>Machine Translation with a Stochastic Grammatical Channel</i>	1408
Haodong Wu, Eduardo de Paiva Alves and Teiji Furugori	
<i>Structural Disambiguation Based on Reliable Estimation of Strength of Association</i>	1416
Masaya Yamaguchi, Takeyuki Kojima, Nobuo Inui, Yoshiyuki Kotani and Hirohiko Nisimura	
<i>Combination of an Automatic and an Interactive Disambiguation Method</i>	1423
Kazuhide Yamamoto and Eiichiro Sumita	
<i>Feasibility Study for Ellipsis Resolution in Dialogues by Machine-Learning Technique</i> . .	1428
Alexander S. Yeh and Marc B. Vilain	
<i>Some Properties of Preposition and Subordinate Conjunction Attachments</i>	1436
Takehiko Yoshimi, Toshiyuki Okunishi, Takahiro Yamaji and Yoji Fukumochi	
<i>Evaluation of Importance of Sentences based on Connectivity to Title</i>	1443
Klaus Zechner	
<i>Automatic Construction of Frame Representations for Spontaneous Speech in Unrestricted Domains</i>	1448
Klaus Zechner and Alex Waibel	
<i>Using Chunk Based Partial Parsing of Spontaneous Speech in Unrestricted Domains for Reducing Word Error Rate in Speech Recognition</i>	1453
Xiaoheng Zhang	
<i>Dialect MT: A Case Study between Cantonese and Mandarin</i>	1460

GuoDong Zhou and KimTeng Lua	
<i>Word Association and MI-Trigger-based Language Modeling</i>	1465

Student Papers

Anja Belz	
<i>Discovering Phonotactic Finite-State Automata by Genetic Search</i>	1472
Donna Byron and Amanda Stent	
<i>A Preliminary Model of Centering in Dialog</i>	1475
Hua Cheng	
<i>Embedding New Information into Referring Expressions</i>	1478
Olivier Ferret	
<i>How to Thematically Segment Texts by using Lexical Cohesion?</i>	1481
Oskari Heinonen	
<i>Optimal Multi-Paragraph Text Segmentation by Dynamic Programming</i>	1484
Oi Yee Kwong	
<i>Bridging the Gap between Dictionary and Thesaurus</i>	1487
Mark Lewellen	
<i>Neural Network Recognition of Spelling Errors</i>	1490
Diana McCarthy and Anna Korhonen	
<i>Detecting Verbal Participation in Diathesis Alternations</i>	1493
Scott McDonald	
<i>Target Word Selection as Proximity in Semantic Space</i>	1496
Elliot Smith	
<i>A Cognitive Model of Coherence-Driven Story Comprehension</i>	1499
Ivelin Stoianov	
<i>Tree-based Analysis of Simple Recurrent Network Learning</i>	1502
Scott M. Thede	
<i>Predicting Part-of-Speech Information about Unknown Words using Statistical Methods</i> .	1505

Author Index

- | | | |
|----------------------------|---------------------------------|------------------------------|
| Abaitua, J. 812 | Bröker, N. 174 | Di Tomaso, V. 320 |
| Abe, N. 749 | Burger, J.D. 201 | Doan-Nguyen, H. 330 |
| Aduriz, I. 379 | Burstein, J. 206 | Doi, S. 336 |
| Agirre, E. 22, 1103 | Buschbeck-Wolf, B. 160 | Dolan, W.B. 1098 |
| Ahrenberg, L. 29 | Byron, D. 1475 | Dorna, M. 160, 341, 365 |
| Akbar, M. 36 | Caelen, J. 36 | Douglas, S. 41 |
| Al-Adhaileh, M.H. 687 | Calcagno, M. 663 | Duff, D. 794 |
| Alegria, I. 379 | Candito, M.-H. 211 | Dymetman, M. 348 |
| Alshawi, H. 41 | Carberry, S. 512, 1150 | Egg, M. 353 |
| Amsili, P. 48 | Cardie, C. 218 | Ehara, T. 1340 |
| Amtrup, J.W. 55 | Carpenter, B. 256 | Einborg, M. 775 |
| Andersson, M. 29 | Casillas, A. 812 | Elmi, M.A. 360 |
| Aone, C. 62 | Chang, J.S. 237 | Emele, M.C. 341, 365 |
| Argamon, S. 67 | Changning, H. 1 | Erjavec, T. 315 |
| Arriola, J.M. 379 | Charniak, E. 1110 | Evans, R. 372 |
| Azzam, S. 74 | Chelba, C. 225 | Evens, M. 360 |
| Bagga, A. 79 | Chen, D. 763 | Evett, L.J. 614 |
| Baker, C.F. 86 | Chen, H.-H. 232 | Ezeiza, N. 379 |
| Baldwin, B. 79 | Chen, J.N. 237 | Ferret, O. 392, 1481 |
| Bangalore, S. 41 | Chen, K.-J. 244 | Ferrández, A. 385 |
| Barcena, E. 1086 | Cheng, H. 1478 | Fillmore, C.J. 86 |
| Barg, P. 91 | Chien, L.-F. 244 | Finch, A. 131, 658 |
| Barker, K. 96 | Chodorow, M. 206 | Finkler, W. 110 |
| Barrière, C. 103 | Choi, K.-S. 251, 723, 1015 | Flank, S. 397 |
| Beale, S. 1328 | Choi, S.-K. 251 | Florian, R. 186 |
| Beals, K.P. 980 | Chotimongkol, A. 836 | Frank, A. 341 |
| Becker, T. 110 | Chu-Carroll, J. 256 | Freitag, D. 404 |
| Beesley, K.R. 117 | Cohen, P.R. 823 | Fromer, J.C. 1345 |
| Belz, A. 1472 | Collier, N. 263, 268 | Fuchi, T. 409 |
| Ben Hamadou, A. 438 | Corley, S. 1060 | Fukumochi, Y. 1443 |
| Blache, P. 124 | Covington, M.A. 275 | Fukumoto, F. 1272 |
| Black, E. 131 | Cristea, D. 281 | Fung, P. 414 |
| Black, E.W. 658 | Cucchiarelli, A. 286 | Furugori, T. 1416 |
| Bod, R. 138, 145 | Daelemans, W. 491 | Furuse, O. 421, 855 |
| Boitet, C. 1205 | Dagan, I. 67 | Gahl, S. 428 |
| Bond, F. 152 | Dahl, D.A. 763, 980 | Gaizauskas, R. 74, 699 |
| Bopp, S. 471 | Dang, H.T. 293 | Gambäck, B. 433 |
| Bos, J. 160, 433 | Davis, P.C. 663 | Gargouri, B. 438 |
| Bozsahin, C. 167 | Declerck, T. 1193 | Gaussier, É. 444 |
| Braden-Harder, L. 206 | Deligne, S. 300 | Gavaldà, M. 451 |
| Branco, A. 181 | Delisle, S. 307 | van Genabith, J. 341 |
| Bredenkamp, A. 1193 | Dimitrova, L. 315 | Gojenola, K. 22 |
| Brill, E. 186, 191 | Ding, Y.-W. 232 | Gong, J. 600 |
| Brockhaus, W. 578 | Dini, L. 320 | Gorlinsky, J. 62 |
| Brun, C. 196 | Di Eugenio, B. 325 | Grau, B. 392 |

Grishman, R.	843	Johnston, M.	624	Lee, G.	675, 756
Groenendijk, M.	1193	Jokinen, K.	631	Lee, J.-H.	675, 756
Gros, C.	498	Jordan, P.W.	325	Lee, S.	723
Guo, J.	457	Jun, Z.	1	Lee, W.	675
Gupta, V.	464	Jung, H.-M.	251	Lepage, Y.	728
ten Hacken, P.	471	Jurafsky, D.	1122	Lesmo, L.	787
Hahn, U.	476	Järvinen, T.	1289	Levin, L.S.	1129
Hajič, J.	483	Jönsson, A.	590	Levow, G.-A.	736
van Halteren, H.	491	Kaalep, H.J.	315	Lewellen, M.	1490
Hamon, T.	498	Kageura, K.	638	Lezius, W.	743
Harper, L.	794	Kahane, S.	646	Li, H.	749
Harris, M.D.	206	Kaki, S.	653	Li, H.-F.	756
Haruno, M.	505	Kamei, S.-i.	336	Li, L.	763, 980
Harvey, T.	512	Kan, M.-Y.	680	Lin, D.	768
Hasida, K.	917, 1282	Kaneji, K.	1381	Lindberg, N.	775
Heine, J.E.	519	Kang, J.-G.	1015	Linebarger, M.C.	763
Heinecke, J.	526	Kaplan, F.	1243	Litman, D.J.	780
Heinonen, O.	1484	Kaplan, R.	145	LLOberas, A.	1233
Henderson, J.	531	Kashioka, H.	131, 658	Loehr, D.	794
Henderson, J.C.	186	Kasper, R.T.	663	Lombardo, V.	787
Hepple, M.	538, 699	Kato, T.	583	Long, D.	1091
Higgins, D.	545	Kawata, Y.	658	Lowe, J.B.	86
Hirakawa, H.	263, 268	Kijsirikul, B.	836	Lu, C.	206
Hirschman, L.	201	Kikui, G.	670	Lua, K.	1465
Hitzeman, J.	550	Kilger, A.	110	LuperFoy, S.	794
Hladká, B.	483	Kim, B.	675	Luzi, D.	286
Honda, T.	881	Kim, T.	251	Létourneau, S.	307
Huang, C.	600	Kinjo, Y.	658	Ma, Q.	802
Huang, S.-J.	232	Kipper, K.	293	Macleod, C.	843
Humphreys, K.	74	Klavans, J.L.	680	Makino, T.	807
Hur, W.	1015	Knight, K.	704	Mangu, L.	186
Hwa, R.	557	Kojima, T.	1423	Marquez, L.	997
Ibekwe-SanJuan, F.	564	Kong, T.E.	687	Martínez, R.	812
Ide, N.	281, 315	Korhonen, A.	1493	Maruyama, I.	1340
Iida, H.	653, 855	Kotani, Y.	1423	Masson, N.	392
IJdens, J.	1060	Koyama, Y.	694	Matiassek, J.	1041
Ikeda, T.	571	Krotov, A.	699	Matsumoto, Y.	990, 1314, 1393
Ingleby, M.	578	Krymolowski, Y.	67	Matwin, S.	307
Inui, N.	1423	Kukich, K.	206	Maybury, M.T.	819
Isahara, H.	802	Kumano, A.	263	McCarthy, D.	1493
Ishizaki, M.	583	Kunze, J.	526	McCoy, K.F.	1198
Jacquemin, C.	595	Kurz, D.	152	McDonald, S.	1496
Jelinek, F.	225	Kwong, O.Y.	1487	McGee, D.R.	823
Ji, D.	600	Lamping, J.	464	McIntyre, A.	830
Jing, H.	607	Lane, P.	531	McKeown, K.	607, 1003
Jmaiel, M.	438	Langkilde, I.	704	Meddeb-Hamrouni, B. ...	1205
Jobbins, A.C.	614	Langlais, P.	711	Meknavin, S.	836
Johnson, M.	619	Lavoie, B.	718		

Menzel, W. 526
 Merkel, M. 29
 Meyers, A. 843
 Mikheev, A. 848
 Miller, K. 794
 Mima, H. 855
 Min, K. 862
 Mitkov, R. 869
 Mitsuishi, Y. 876
 Miyata, T. 1314
 Mochizuki, H. 881
 Moghrabi, C. 886
 Mohri, M. 891
 Moliner, J.L. 1233
 Moore, J.D. 325
 Moreno, L. 385
 Moreno-Sandoval, A. 843
 Mori, S. 898
 Mori, T. 929
 Mouret, P. 905
 Muraki, K. 571
 Murata, M. 912
 Nagao, K. 917
 Nagao, M.
 898, 912, 1374, 1381
 Nagata, M. 922
 Nakagawa, H. 929
 Nakanishi, M. 1171
 Nakano, M. 934
 Nakatani, C.H. 939
 Narayanan, S. 1345
 Nasr, A. 646
 Nazarenko, A. 498
 Nederhof, M.-J. 946, 953
 Ney, H. 960
 Niehren, J. 353
 Nießen, S. 960
 Niklfeld, G. 1041
 Ninomiya, T. 968
 Nirenburg, S. 975, 1328
 Nisimura, H. 1423
 Noda, I. 1282
 Norton, L.M. 763, 980
 Nuttee, C. 836
 Och, F.J. 985
 Oflazer, K. 1277
 Oishi, A. 990
 Okada, Y. 1381

Okamura, J. 929
 Okumura, A. 571
 Okumura, M. 881
 Okunishi, T. 1443
 Okurowski, M.E. 62
 Omori, N. 929
 Ono, K. 268
 Ooyama, Y. 505
 Oviatt, S. 823
 Padró, L. 997
 de Paiva Alves, E. 1416
 Palmer, D. 201
 Palmer, M. 293
 Palomar, M. 385
 Pan, S. 780, 1003
 Paraboni, I. 1010
 Pardo, M.A. 1333
 Park, D.-I. 251
 Park, J. 1015
 Park, J.-S. 251
 Pautler, D. 1020
 Penn, G. 1027
 Pereira, F.C.N. 891
 Pericliev, V. 1034
 Petkevic, V. 315
 Phelan, P. 1193
 Pierce, D. 218
 Piitulainen, J. 1289
 Pirker, H. 1041
 Poesio, M. 550
 Poller, P. 110
 Popescu-Belis, A. 1046
 Power, R. 1053
 Poznanski, V. 1060
 Prószyński, G. 1067
 Quilici, A. 1020
 Radev, D.R. 1072
 Rambow, O. 646, 718
 Rapp, R. 743
 Raskin, V. 975
 Ratnaparkhi, A. 1079
 Read, T. 1086
 Reed, C. 1091
 Reeder, F. 794
 Richardson, S.D. 1098
 Rieder, S. 1193
 Rigau, G. 1103
 Roark, B. 1110

Robba, I. 1046
 Rodríguez, H. 1103
 Rogers, J. 1117
 Roland, D. 1122
 Rolbert, M. 905
 Romary, L. 281
 Rosenzweig, J. 293
 Rossari, C. 48
 Rosé, C.P. 1129
 Roth, D. 1136
 Ruhrberg, P. 353
 Rupp, C.J. 160
 Sabah, G. 1046
 Sagisaka, Y. 300
 Saint-Dizier, P. 1143
 Samuel, K. 1150
 Sanfilippo, A. 1157
 Sankoff, D. 8
 Sarasola, K. 22
 Sarkar, A. 953, 1164
 Sato, K. 1171
 Satta, G. 953, 1176
 Sawamura, E. 1340
 Schiehlen, M. 1183
 Schilder, F. 1188, 1294
 Schmid, P. 1193
 Schnattinger, K. 476
 Schneider, D. 1198
 Schröder, I. 526
 Schuler, W. 1176
 Schulz, H. 1193
 Scott, D. 1053
 Segond, F. 320
 Sekiguchi, Y. 1272
 Seligman, M. 1205
 Senellart, J. 1212
 Shaw, J. 1220
 Shen, D. 1265
 Shimazu, A. 934
 Shirai, K. 1340
 Shirai, S. 152, 505
 Shudo, K. 694
 Sim, C.-M. 251
 Simard, M. 711
 Smith, E. 1499
 Somers, H.L. 1227
 Sopena, J.M. 1233
 Stede, M. 1238

Steels, L.	1243	Umbach, C.	1238	Whitelock, P.	1060
Stent, A.	1475	Uramoto, N.	1307	Wilcock, G.	1393
Stevenson, M.	1398	Urizar, R.	379	Wilks, Y.	699, 1398
Stoianov, I.	1502	Utsuro, T.	1314	Wilson, W.H.	862
Strube, M.	1251	Valdés-Pérez, R.E.	1034	Wise, B.	1258
Strube de Lima, V.L. ..	1010	Vanderwende, L.	1098	Wolff, S.	206
Strzalkowski, T.	1258	Velardi, P.	286	Wong, H.	1408
Strömbäck, L.	590	Verspoor, C.M.	1352	Worm, K.L.	1403
Sumita, E.	653, 1428	Viegas, E.	1321, 1328	Wu, D.	1408
Sun, M.	1265	Vijay-Shanker, K.	1150	Wu, H.	1416
Suzuki, Y.	1272	Vilain, M.B.	1436	Wu, J.	191
Szpakowicz, S.	96	Villemonde de la Clergerie, E.	1333	Xu, F.	353
Takagi, S.	409	Vogel, S.	960	Yamabana, K.	336
Takeda, K.	1307, 1369	Voutilainen, A.	22	Yamada, S.	421
Tanaka, H.	631	Véronis, J.	711	Yamaguchi, M.	1423
Tanaka-Ishii, K.	1282	Waibel, A. ...	451, 1357, 1453	Yamaji, T.	1443
Tapanainen, P.	1289	Wakao, T.	1340	Yamamoto, K.	421, 1428
Tappe, H.	1294	Walker, M.A.	780, 1345	Yangarber, R.	843
Thede, S.M.	1505	Walther, M.	91	Yasutake, M.	694
Theofilidis, A.	1193	Wan, S.	1352	Yee, L.Y.	414
Thomason, R.H.	325	Wang, J.	1258	Yeh, A.S.	1436
Tillmann, C.	960	Wang, Y.-Y.	1357	Yokoo, A.	631
Torisawa, K. ...	807, 876, 968	Wasson, M.	1364	Yoshida, M.	807
Trost, H.	1041	Watanabe, H.	1369	Yoshimi, T.	1443
Tsai, S.-C.	232	Watanabe, Y.	1374, 1381	Yoshimura, K.	694
Tsou, B.K.	1265	Weber, H.	985	Zavrel, J.	491
Tsuei, W.	244	Weber, V.	55	Zechner, K.	1448, 1453
Tsujii, J.	807, 876, 968	Wehrli, E.	1388	Zelenko, D.	1136
Tufis, D.	315	Weir, D.	372	Zhang, X.	1460
Turcato, D.	1299	Wettler, M.	743	Zhou, G.	1465
Tür, G.	1277				