

## Note from the editor: “Rethinking natural language processing for speech technology”

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This special issue of the Journal is devoted to “rethinking” the science of natural language processing (NLP), which serves as the design foundation of spoken dialog systems. Many of the complaints we hear today from speech developers about the rate of performance of automatic speech recognition, and of text to speech synthesis systems, can be effectively addressed by way of a better understanding of natural language processing—an interdisciplinary field of research that combines linguistics, cognitive science, psychology, computer science and artificial intelligence to study the interactions between computers and human (natural) languages.

So clarifying NLP is exactly what this special issue aims at doing—in particular, rethinking how NLP can close the gap in the performance of automatic speech recognition and text to speech synthesis systems. To accomplish this, the contributors to Vol. 11, Nos. 3–4 have been at pains to explore, analyze and critique some of the most intricate and complex aspects of NLP—as well as to present novel methodological and practical solutions to some persistent problems that impede the performance of spoken dialog systems.

The articles in this issue embrace such tasks as:

- (1) Raising fundamental questions about reductionist/formalistic/hierarchical approaches to the construction of ontologies as a resource for NLP;
- (2) Tackling ineluctable metaphorical utterances in the practical applications of NLP, using a reasoning system that relies on source subject matter rather than

construct new mapping relationships to handle the unmapped source elements;

- (3) Examining the role of an abstract ontology in the interpretation of creative cross-modal metaphors which extend across conceptual domains;
- (4) Exploring the connection between sense abstractness and semantic activation and the resulting implications for semantic network models and the lexical sensitivity of word sense disambiguation (WSD);
- (5) Assessing the limitations of syntactic parsing methods for the automatic generation of thesauri and the alternative use of singular value decomposition (SVD);
- (6) Meeting the challenges of text segmentation of spoken meeting transcripts by combining semantically complex lexical relations with conversational cue phrases to build lexical chains in determining topic boundaries;
- (7) Replacing conventional default boundary detection methods with *intended* boundary detection as a means of tracking topic change for text segmentation, by incorporating structural information traditionally discarded by default boundary detection methods;
- (8) Facilitating natural language generation through the use of conceptually guided message composition;
- (9) Rethinking the task of semantic processing through recovering *implicit* or lexically unexpressed linguistic elements (entities and events) that are necessary for a complete semantic interpretation of a text; and
- (10) Rethinking human-human dialog as a precondition for the design of user-friendly spoken dialog systems.

The inspiration for this special issue comes from Bernadette Sharp of Staffordshire University. Since 2004, Bernadette has successfully assembled scientists for her annual workshop, Natural Language Processing and Cognitive Science, to work in tandem with the International Confer-

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ence for Enterprise Information Systems. Yorick Wilks and John Barnden, whose insightful papers appear in this special issue, have given distinguished keynote addresses at NLPCS workshops in past years. When asked about the purpose of her workshop, Bernadette said, “It was critically important to start thinking in an interdisciplinary way, bridging the gap between statistical, linguistic, psychological and computational research efforts in NLP”

Each of the articles presented here is a significantly expanded version of one of the NLPCS workshop presentations. Each paper underwent peer review by IJST reviewers; many were revised repeatedly before they were finally

accepted for publication. This was done to ensure the highest level of clarity and thoroughness in each of these complex topics, so that readers who are not knowledgeable about NLP can benefit from the articles as much as those who are.

This special issue would not have been possible if not for the support and understanding of Springer’s Editorial Director, Alex Greene, and his dedicated staff: Marielle Klijn, Production Editor, Ciara J. Vincent, Editorial Assistant, and Christine Rodriguez, Journals Editorial Office Assistant. I personally thank each of them for making my role as Editor in Chief the pleasure it has been.