

# Keynotes

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## Putting Language Into Language Modeling

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ABSTRACT

In this paper we describe the statistical Structured Language Model (SLM) that uses grammatical analysis of the hypothesized sentence segment (prefix) to predict the next word. We first describe the operation of a basic, completely lexicalized SLM that builds up partial parses as it proceeds left to right. We then develop a chart parsing algorithm and with its help a method to compute the prediction probabilities  $P(w_{i+1}|w_i)$ : We suggest useful computational shortcuts followed by a method of training SLM parameters from text data. Finally, we introduce more detailed parametrization that involves non-terminal labeling and considerably improves smoothing of SLM statistical parameters. We conclude by presenting certain recognition and perplexity results achieved on standard corpora.

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## The Controversial Connection Between Speech Production And Perception: Theories Vs. Facts

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ABSTRACT

Neurolinguistic investigations support the dissociation between speech production and speech perception in the case of aphasia. This means that an aphasic patient may be able to understand words and sentences while he is not able to produce them or, he may be able to produce certain linguistic forms properly while he is not able to detect the semantics of verbal utterances. Empirical data, however, seem to contradict the supposed excellent co-operation of speaking and perceiving in normal subjects as well. Various phenomena such as slips of the ear, violations of co-operation strategy of communication as well as the controversial connections of speech production and perception during language acquisition show dissociations of the two mechanisms. The question is how the properly working speech production co-

occurs with inappropriate speech perception and what is the strategy where appropriate speech perception is escorted by inappropriate speech production.

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## **Multimedia Interaction For The New Millennium**

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### **ABSTRACT**

Spoken language processing has created value in multiple application areas such as document transcription, data base entry, and command and control. Recently scientists have been focusing on a new class of application that promises on-demand access to multimedia information such as radio and broadcast news. In separate research, augmenting traditional graphical interfaces with additional modalities of interaction, such as spoken language, gesture, or eye tracking, promises to enhance human computer interaction. In this address I discuss the synergy of speech, language and image processing, introduce a new idea for corpus based multimedia interfaces, and identify some remaining challenging research areas.

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## **How Speech Works Questions And Preliminary Answers**

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### **ABSTRACT**

In this presentation I attempt to discuss research from a wide spectrum of topics all relevant to the study of speech communication. It is my hope that placing more narrowly focused work in a common, broader context will produce a kind of symbiosis effect that will help us see the individual subtopics in perhaps new and insightful ways. Admittedly, such an undertaking might seem ambitious and even ill-advised. However, as our field is put under increasing pressures to deliver clinical and technological applications of greater real-life relevance, it does appear useful to try to assess what we know and do not know about speech processes. Also, as is sometimes the case, the whole tends to be more than the sum of its parts.