

# **AAAI-94 Workshop on Integration of Natural Language and Speech Processing**

Twelfth National Conference on Artificial Intelligence (AAAI-94)  
Washington State Convention and Trade Center  
Seattle, Washington, USA

Sunday/Monday, July 31st/August 1st, 1994

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Dr. Eiichiro Sumita (ATR, Japan)  
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Prof. Yorick Wilks (Sheffield, England)  
Prof. Dr. Wolfgang Wahlster (DFKI, Germany)  
Dr. Sheryl R. Young (CMU, USA)

# Table of contents

<b>Preface</b>	iii
<b>Programme</b>	v
<b>Left-to-Right analysis of spoken language</b> Bernd Seestaedt, Franz Kummert & Gerhard Sagerer .....	1
<b>An N-Best representation for bidirectional parsing strategies</b> Anna Corazza & Alberto Lavelli .....	7
<b>Incorporation of phoneme-context-dependence in LR table through constraint propagation method</b> Hozumi TANAKA, Hui LI & Takenobu TOKUNAGA .....	15
<b>On the need for a theory of knowledge sources for spoken language understanding</b> Karen Ward & David G. Novick .....	23
<b>Detection of misrecognitions and out-of-vocabulary words in spontaneous speech</b> Sheryl R. Young .....	31
<b>An outline of the Verbmobil project with focus on the work at the University of Hamburg</b> J. Amtrup, Andreas Hauenstein, Kai Hübener, C. Pyka, V. Weber & S. Wermter ...	37
<b>An investigation of tightly coupled time synchronous speech language interfaces using a unification grammar</b> Andreas Hauenstein & Hans H. Weber .....	42
<b>An approach to tightly-coupled syntactic/semantic processing for speech understanding</b> Nigel Ward .....	50
<b>Pragmatic language constraint models for large-vocabulary speech processing</b> Eric Atwell and Paul Mc Kevitt .....	58
<b>SpeechActs: a testbed for continuous speech applications</b> Paul Martin & Andy Kehler .....	65
<b>NL and speech in the MULTEXT project</b> Jean Veronis, Daniel Hirst, Robert Espesser & Nancy Ide .....	72
<b>JANUS-II: research in spoken language translation</b> Alex Waibel .....	79

<b>Work at ATR on spoken language translation</b>	
Eiichiro SUMITA, Osamu FURUSE & Hitoshi IIDA .....	80
<b>Bilingual corpus for speech translation</b>	
Osamu FURUSE, Yasuhiro SOBASHIMA, Toshiyuki TAKEZAWA & Noriyoshi URATANI .....	84
<b>Speech-language integration in a multi-lingual speech translation system</b>	
Bernhard Suhm, Lori Levin, N. Coccaro, Jaime Carbonell, K. Horiguchi, R. Isotani, A. Lavie, L. Mayfield, C.P. Rosé, C. Van Ess-Dykema & Alex Waibel .....	92
<b>Towards an artificial agent as the kernel of a spoken dialogue system: a progress report</b>	
David Sadek, A. Ferrieux & A. Cozannet .....	100
<b>Integrating experimental models of syntax, phonology, and accent/dialect in a speech recognizer</b>	
Daniel Jurafsky, Chuck Wooters, Gary Tajchman, Jonathan Segal, Andreas Stolcke & Nelson Morgan .....	107
<b>Spoken dialog systems: basic approach and overview</b>	
Sheryl R. Young .....	116
<b>Speech recognition for multi-speaker dialog: discourse structure constraints</b>	
Sheryl R. Young .....	122
<b>A study of intonation and discourse structure in directions</b>	
Barbara J. Grosz, Julia Hirschberg & Christine H. Nakatani .....	124
<b>Pantomime: An integrative architecture for speech and natural language processing</b>	
William Edmondson, Jon Iles & Paul Mc Kevitt .....	132
<b>Integrating language models with speech recognition</b>	
Mary P. Harper, Leah H. Jamieson, Carl D. Mitchell, Goangshiuang Ying, SiriPong Potisuk, Pramila N. Srinivasan, Ruxin Chen, Carla B. Zoltowski, Laura L. McPheters, Bryan Pellom & Randall A. Helzerman .....	139

## Preface

There has been a recent move towards considering the integration of perception sources in Artificial Intelligence (AI) (see Dennett, 1991 and Mc Kevitt, 1994). This workshop will focus on research involved in the integration of Natural Language Processing (NLP) and Speech Processing (SP). The aim here is to bring to the AI community results being presented at computational linguistics (e.g. COLING/ACL/EACL) and speech conferences (e.g. ICASSP, ICSLP), and vice-versa.

Although there has been much progress in developing theories, models and systems in the areas of NLP and SP we have just started to see progress on integrating these two subareas of AI. Most success has been with speech synthesis and less with speech understanding.

However, there are still a number of important questions to answer about the integration of speech and language processing. How is intentional information best gleaned from speech input? How does one cope with situations where there are multiple speakers in a dialogue with multiple intentions? How does discourse understanding occur in multi-speaker situations with noise? How does prosodic information help NLP systems? What corpora (e.g. ARPA ATIS corpora, MAP-TASK corpus from Edinburgh) exist for integrated data on speech and language?

The workshop is of particular interest at this time because research in NLP and SP has advanced to the stage that they can each benefit from integrated approaches. Also, such integration is important as people in NLP and SP can gain insight from each others' work.

## References

- Dennett, Daniel (1991) *Consciousness explained*. Harmondsworth: Penguin.  
Mc Kevitt, Paul (1994) (Guest Editor) Integration of Natural Language and Vision Processing. In *Special Volume (Vol. 8) of AI Review Journal*, Dordrecht: Kluwer (forthcoming).

## Workshop topics

The workshop will focus on these themes:

- Speech understanding

- Dialogue & Discourse
- Machine translation
- Architectures
- Site descriptions (Hamburg, JANUS-II, ATR, CMU)

## Reviewing

All papers were reviewed by leading researchers in the field including the Workshop Committee and authors. The following additional reviewers are to be thanked:

Hans Dybkjaer, Laila Dybkjaer, Phil Green, Kate Morton, Fernando Pereira,  
Tony Simons, Marcel Tatham

I would like to point out that this workshop was, on the whole, organised electronically. The call for papers, programme checks, liaisons with Workshops Chair, AAAI, and the Workshop Committee, virtually all submissions of papers, reviewing, acceptances, and receipt of camera ready copies were conducted electronically. *UNIX uudecode*, *uncompress*, *gzip* as well as *ftp* and *postscript* proved useful here. Such is the world today!

## Hope

Finally, I would like to thank Donald Perlis, the AAAI-94 Workshops Chair, the Workshop Committee, the authors and Annette Eldredge, Mike Hamilton and Sally McLaughlin at AAAI for cooperating wonderfully on organisation. I hope that our visions for integration of language and speech processing will come true in the years to come!

Slan Leat,  
Paul Mc Kevitt  
Department of Computer Science  
University of Sheffield  
England, EU  
May 1994.

# Programme

**Sunday, July 31st, 1994**

## **INTRODUCTION I:**

- 8.45 'Introduction'  
Paul Mc Kevitt

## **SPEECH UNDERSTANDING I:**

(Chair: Alberto Lavelli)

- 9.00 'Left-to-Right analysis of spoken language'  
Bernd Seestaedt, Franz Kummert & Gerhard Sagerer  
Universität Bielefeld, Germany, EU
- 9.30 'An N-Best representation for bidirectional parsing strategies'  
Anna Corazza & Alberto Lavelli  
IRST, Trento, Italy, EU

10.00 **Break**

- 10.30 'Incorporation of phoneme-context-dependence in LR table'  
through constraint propagation method  
Hozumi TANAKA, Hui LI & Takenobu TOKUNAGA  
Tokyo Institute of Technology, Tokyo, Japan

11.00 **Discussion**

## **SPEECH UNDERSTANDING II:**

(Chair: Karen Ward)

- 11.15 'On the need for a theory of knowledge sources for spoken language understanding'  
Karen Ward & David G. Novick  
Oregon Graduate Institute of Science and Technology, Oregon, USA
- 11.45 'Detection of misrecognitions and out-of-vocabulary words in spontaneous speech'  
Sheryl R. Young  
School of Computer Science, Carnegie Mellon University, USA

12.15 **Discussion**

12.30 **LUNCH**

## **SITE DESCRIPTION I:**

(Chair: Nigel Ward)

- 2.00 ‘An outline of the Verbmobil project with focus on the work at the University of Hamburg’  
J. Amtrup, Andreas Hauenstein, Kai Hübener, C. Pyka, V. Weber & S. Wermter  
University of Hamburg, Germany, EU

## **ARCHITECTURES I:**

(Chair: Nigel Ward)

- 2.15 ‘An investigation of tightly coupled time synchronous speech language interfaces using a unification grammar’  
Andreas Hauenstein & Hans H. Weber  
University of Hamburg & University of Erlangen-Nürnberg, Germany, EU
- 2.45 ‘An approach to tightly-coupled syntactic/semantic processing for speech understanding’  
Nigel Ward  
University of Tokyo, Japan

3.15 **Discussion**

3.30 **Break**

## **DIALOGUE & DISCOURSE I:**

(Chair: Jean Veronis)

- 4.00 Pragmatic language constraint models for large-vocabulary speech processing  
Eric Atwell and Paul Mc Kevitt  
University of Leeds & University of Sheffield, England, EU
- 4.30 SpeechActs: a testbed for continuous speech applications  
Paul Martin & Andy Kehler  
Sun Microsystems Laboratories, Inc. & Harvard University, USA
- 5.00 NL and speech in the MULTEXT project  
Jean Veronis, Daniel Hirst, Robert Espesser & Nancy Ide  
CNRS & Universite de Provence, Aix-en-Provence, France, EU

5.30 **Discussion**

6.00 **Oiche Mhaith**

# Monday, August 1st, 1994

## INTRODUCTION II:

- 8.45 'Introduction'  
Paul Mc Kevitt

## SITE DESCRIPTIONS II & III:

(Chair: Eiichiro Sumita)

- 9.00 'JANUS-II: research in spoken language translation'  
Alex Waibel  
School of Computer Science, Carnegie Mellon University, USA &  
University of Karlsruhe, Germany, EU
- 9.15 'Work at ATR on spoken language translation'  
Eiichiro SUMITA, Osamu FURUSE and Hitoshi IIDA  
ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan

## MACHINE TRANSLATION:

(Chair: Bernhard Suhm)

- 9.30 'Bilingual corpus for speech translation'  
Osamu FURUSE, Yasuhiro SOBASHIMA, Toshiyuki TAKEZAWA &  
Noriyoshi URATANI  
ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan

10.00 **Break**

- 10.30 'Speech-language integration in a multi-lingual speech translation system'  
Bernhard Suhm, Lori Levin, N. Coccaro, Jaime Carbonell, K. Horiguchi,  
R. Isotani, A. Lavie, L. Mayfield, C.P. Rose, C. Van Ess-Dykema & Alex Waibel  
School of Computer Science, Carnegie Mellon University, USA  
ATR Interpreting Telecommunications Research Laboratories, Kyoto, Japan  
U.S. Department of Defense, & University of Karlsruhe, Germany, EU

11.00 **Discussion**

## ARCHITECTURES II:

(Chair: Daniel Jurafsky)

- 11.30 'Towards an artificial agent as the kernel of a spoken dialogue system: a progress report'  
David Sadek, A. Ferrieux & A. Cozannet  
French Telecom, CNET, France, EU
- 12.00 'Integrating experimental models of syntax, phonology, and accent/dialect  
in a speech recognizer'  
Daniel Jurafsky, Chuck Wooters, Gary Tajchman, Jonathan Segal,  
Andreas Stolcke & Nelson Morgan



ICSI and University of California at Berkeley, Berkeley, USA

12.30 **Discussion**

12.45 **LUNCH**

**SITE DESCRIPTION IV:**

(Chair: Sheryl R. Young)

2.00 ‘Spoken dialog systems: basic approach and overview’

Sheryl R. Young

School of Computer Science, Carnegie Mellon University, USA

**DIALOGUE & DISCOURSE II:**

(Chair: Sheryl R. Young)

2.15 ‘Speech recognition for multi-speaker dialog: discourse structure constraints’

Sheryl R. Young

School of Computer Science, Carnegie Mellon University, USA

2.45 ‘A study of intonation and discourse structure in directions’

Barbara J. Grosz, Julia Hirschberg & Christine H. Nakatani

Harvard University & AT&T Bell Laboratories, USA

3.15 **Discussion**

3.30 **Break**

**ARCHITECTURES III:**

(Chair: Mary P. Harper)

4.00 ‘Pantome: An integrative architecture for speech and natural language processing’

William Edmondson, Jon Iles & Paul Mc Kevitt

University of Birmingham & University of Sheffield, England, EU

4.30 ‘Integrating language models with speech recognition’

Mary P. Harper, Leah H. Jamieson, Carl D. Mitchell, Goangshuan Ying,

SiriPong Potisuk, Pramila N. Srinivasan, Ruxin Chen, Carla B. Zoltowski,

Laura L. McPheters, Bryan Pellom & Randall A. Helzerman

School of Electrical Engineering, Purdue University, USA

5.00 **Discussion**

5.15 **Oiche Mhaith**