

# Speech and Natural Language

Proceedings of a Workshop  
Held at  
Cape Cod, Massachusetts  
October 15-18, 1989

Sponsored by:

**Defense Advanced Research Projects Agency  
Information Science and Technology Office**

This document contains copies of reports prepared for the DARPA Speech and Natural Language Workshop. Included are reports from DARPA/ISTO sponsored programs and other materials prepared for use at the workshop.

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Distributed by  
Morgan Kaufmann, Publishers, Inc.  
2929 Campus Drive  
San Mateo, California 94403  
ISBN 1-55860-112-0  
Printed in the United States of America

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## FOREWORD

The second DARPA-sponsored Speech and Natural Language Workshop was held on Cape Cod on 15-18 October 1989. Approximately 120 people representing a wide range of research groups and government agencies attended this by-invitation-only workshop. Of the non-DARPA participants, AT&T was heavily represented and made particularly important contributions.

Significant technical advances were reported during the formal sessions. Informal discussions filled much of the remaining time and often lasted late into the evening. The speech and natural language sessions were interleaved, and the two research communities interacted in meaningful ways.

This bulk of this Proceedings consists of short overviews of the twelve sessions plus the technical papers presented during those sessions. Following the papers is a set of brief project summaries describing the focus of each DARPA-sponsored group. At the end are two white papers with important observations about the speech and natural language fields.

Many people, including all the authors who contributed to this volume, worked long and hard to make the workshop a success. Special recognition goes to Victor Zue, who served as General Chair. An organizing committee consisting of Lyn Bates, Ralph Grishman, Lynette Hirschman, Steve Levinson, John Makhoul, Patti Price, and Cliff Weinstein worked with Victor to design the program. Mary Sullivan assembled the Proceedings.

The cover artwork suggests both the location of the workshop and the speech understanding capabilities of MIT's VOYAGER system shown on videotape at the workshop and described in the paper beginning on page 51.

Charles L. Wayne  
Program Manager

|             | Sunday 10/15                        | Monday 10/16                      | Tuesday 10/17                   | Wednesday 10/18                             |
|-------------|-------------------------------------|-----------------------------------|---------------------------------|---|
| 7:30-8:30   |                                     |                                   | BREAKFAST                       |   |
| 8:30-10:30  |                                     | Spoken Language Systems I         | Spoken Language Systems II      | Continuous Speech Recognition II            |
| 10:30-11:00 |                                     | COFFEEBREAK                       |                                 |   |
| 11:00-12:30 |                                     | Natural Language I                | Natural Language II             | Natural Language III                        |
| 12:30-1:30  |                                     | LUNCH                             |                                 |   |
| 1:30-2:30   |                                     | FREE ACTIVITIES                   |                                 |   |
| 2:30-4:00   |                                     |                                   |                                 | Hardware for Spoken Language Demonstrations |
| 4:00-6:30   | CHECK-IN                            | Data Collection and Evaluation I  | Continuous Speech Recognition I | Ajournment                                  |
| 6:30-7:00   |                                     | COCKTAILS (Cash Bar)              |                                 |   |
| 7:00-8:30   |                                     | DINNER                            |                                 |   |
| 8:30-10:00  | Prosodic Aids to Speech Recognition | Data Collection and Evaluation II | Future Plans                    |   |