Preface

This book comprises the papers selected for presentation at the Sixth International Workshop on Natural Language Generation held in Castel Ivano, Trento, Italy, April 5 – 7, 1992. The five previous international workshops on natural language generation were held in Stettenfels, near Stuttgart (Germany) in 1983; Stanford, California (USA) in 1984; Nijmegen (Netherlands) in 1986; Santa Catalina Island near Los Angeles (USA) in 1988 and Dawson, Pennsylvania (USA) in 1990.

Some of these previous workshops have resulted in published proceedings, e.g., G. Kempen (Ed.) Natural Language Generation, NATO ASI Series E 135, Martinus Nijhoff Publishers, 1987, and Cécile L. Paris, William R. Swartout and William C. Mann (Ed.), Natural Language Generation in Artificial Intelligence and Computational Linguistics, Kluwer Academic Publishers, 1991. On this occasion the organizers adopted the approach of having a published version of the proceedings ready in time for the workshop. This sacrifices the possibility of papers being revised on the basis of workshop discussions, but has the benefit of producing a more timely snapshot of the state of the art in a rapidly consolidating field, avoiding the usual lengthy publishing delays.

The papers submitted were reviewed by an international programme committee; based on their judgement and criticism the 17 papers included in this book were selected.

In addition to the organizers the following colleagues acted as reviewers:

Hans Ulrich Block — SIEMENS, Munich, Germany
Koenraad De Smedt — University of Leiden, Leiden, The Netherlands
Helmut Horacek — University of Bielefeld, Bielefeld, Germany
Kathy McCoy — University of Delaware, Newark, USA
David McDonald — Cambridge, USA
Kathy McKeown — Columbia University, New York, USA
Johanna Moore — University of Pittsburgh, Pittsburgh, USA
Henk Schotel — University of Amsterdam, Amsterdam, The Netherlands
Donia Scott — Brighton Polytechnic, Brighton, England
Patrick St Dizier — INRIA, Toulouse, France

In addition to the paper presentations, the workshop included an invited lecture and two panel discussions. In order to broaden our own perspective, we chose to invite Professor Nadia Magnenat-Thalmann, University of Geneva (Switzerland), a well-known researcher in computer animation and author of several books and numerous papers on this topic, to present her views of the two fields and their potential for collaborative research in the future.

The two panels are organized around the topics of “Multilinguality and Generation” and “Extending Language Generation to Multiple Media”. The majority of the panelists’ statements are included in this book, although some were unfortunately not available in time for the publication deadline.
As on previous occasions, this workshop has been organized on a volunteer basis. The workshop would not have been possible without the help and efforts of numerous people: We have to thank all researchers who submitted papers, and all those who took part in the workshop presentations and discussions. We have to thank the international programme committee for their timely and thorough reviewing work. We have to thank the secretarial staff of our institutes, i.e., the Information Sciences Institute (ISI) in Marina del Rey, Los Angeles, the Centre for Cognitive Science, University of Edinburgh, the Forschungsinstitut für anwendungsorientierte Wissensverarbeitung (FAW) in Ulm, the Istituto per la Ricerca Scientifica e Tecnologica (IRST) in Trento, and – last but not least – the staff and management of Castel Ivano who made available to us the marvellous site of the workshop.

We also have to thank the co-sponsoring organizations for their support: The special interest group on generation of the Association for Computational Linguistics (ACL SIGGEN), and the ESPRIT Basic Research Actions. A very special thanks goes to Harry Schoett, a diploma student of economics, mathematics and computer science at the University of Ulm and research assistant at the FAW who managed to get all contributions into the book in order to have it published in time by Springer-Verlag.

February 1992

Robert Dale
Eduard Hovy
Dietmar Rösner
Oliviero Stock
# Table of Contents

## INVITED SPEAKER

A Model for Creating and Visualizing Speech and Emotion .......................... 1  
*Nadia Magnenat-Thalmann, Prem Kalra*

## GENERATOR SYSTEM ARCHITECTURE

Integrated Natural Language Generation Systems ............................. 13  
*Mark Kantrowitz, Joseph Bates*

An Integrated View of Text Planning ........................................... 29  
*Helmut Horacek*

Integrating Text Planning and Linguistic Choice  
by Annotating Linguistic Structures .............................................. 45  
*Robert Rubinoff*

Employing Knowledge Resources  
in a New Text Planner Architecture ............................................. 57  
*Eduard Hovy, Julia Lavid, Elisabeth Maier, Vibhu Mittal, Cécile Paris*

## ISSUES IN REALISATION

Type-Driven Suppression of Redundancy  
in the Generation of Inference-Rich Reports ................................... 73  
*David D. McDonald*

Controlling Content Realization  
with Functional Unification Grammars .......................................... 89  
*Michael Elhadad, Jacques Robin*

Syntactic Selection in Linguistic Realization:  
A Comparative Study ................................................................. 105  
*Ishizaki Masato*

A Constraint Logic Programming Treatment of Syntactic Choice  
in Natural Language Generation ..................................................... 119  
*Patrick Saint-Dizier*
ISSUES IN DISCOURSE STRUCTURE

Generating Utterances in Dialogue Systems ............................... 135

   Nick J. Youd, Scott McGlashan

Monologue as a Turn in Dialogue:
Towards an Integration of Exchange Structure
and Rhetorical Structure Theory ................................. 151

   Robin P. Fawcett, Bethan L. Davies

Abducing Temporal Discourse ........................................... 167

   Alex Lascarides, Jon Oberlander

Using System Networks to Build Rhetorical Structures .............. 183

   Keith Vander Linden, Susanna Cumming, James Martin

Customizing RST for the Automatic Production
of Technical Manuals ................................................ 199

   Dietmar Rösner, Manfred Stede

BEYOND TRADITIONAL GENERATION

Text Revision: A Model and Its Implementation ........................ 215

   Kentaro Inui, Takenobu Tokunaga, Hozumi Tanaka

Transparency-Motivated Metaphor Generation ............................ 231

   Mark A. Jones, Kathleen F. McCoy

Generating Referring Expressions in a Multimodal Environment .... 247

   Wim Claassen

The Performance of an Incremental Generation Component
for Multi-Modal Dialog Contributions ................................ 263

   Norbert Reithinger

PANEL STATEMENTS

Extending Language Generation to Multiple Media ...................... 277

   Arens, Dale, Kerpedjie, McKeown, Stock, Wahlster et al.

Multilinguality and Generation ........................................... 293

   Hovy, Kittredge, Matthiessen et al., Nirenburg, Rösner