

Reversible Grammar in Natural Language Processing

**Proceedings of a Workshop
Sponsored by the Special Interest Groups
on Generation and Parsing
of the
Association for Computational Linguistics**

**Edited by
Tomek Strzalkowski**

**Supported by
Defense Advanced Research Projects Agency
National Science Foundation**

**17 June 1991
University of California
Berkeley, California, USA**

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PREFACE

This volume contains the papers presented at the workshop on *Reversible Grammar in Natural Language Processing*.

The notion that a single grammar could be used in natural language analysis and generation is by no means a surprising one. Intuitively we feel that it should be possible to propose a set of rules and/or principles which would define the class of well-formed expressions of a given language independently of any particular task. Despite the variety of linguistic theories available today this result remained elusive, until recently. In the past few years, however, there has been an increasing interest in reversible grammar research, and some significant new results have emerged. This workshop is the first international meeting entirely devoted to the problems of reversible grammar in natural language processing as seen from various viewpoints: theoretical linguistics, computational linguistics and computer science.

I would like to take this opportunity to thank all these authors who submitted papers of such high quality, for it is they who have made this meeting possible. I am of course especially grateful to the Program Committee, Marc Dymetman, Patrick Saint-Dizier and Gertjan van Noord, for their careful reviewing of the papers, and their invaluable help in organizing this workshop. We are also particularly indebted to Martin Kay, the keynote speaker, for adding a special sparkle to our meeting.

This meeting of course would not be possible without generous help from the Association for Computational Linguistics, particularly Don Walker, Peter Norvig and Ralph Grishman. The workshop has been sponsored by the Special Interest Groups on Generation (SIGGEN) and Parsing (SIGPARSE), and my special thanks go to Karen Kukich, Marie Meteer, and Masaru Tomita. Financial support has been provided by the Defense Advanced Research Projects Agency and the National Science Foundation under grants to New York University.

Tomek Strzalkowski
Chair, Program Committee

WORKSHOP PROGRAM

17 June 1991
120 Bechtel Hall, University of California, Berkeley

OPENING SESSION (chair Tomek Strzalkowski)

- 9:00- 9:10 opening remarks
Tomek Strzalkowski
- 9:10- 9:40 **Keynote Address:** *Monotonicity, Headedness, and Reversible Grammar.*
Martin Kay
- 9:40- 9:55 discussion

SESSION 1: CONSTRAINT-BASED FORMALISMS (chair Tomek Strzalkowski)

- 9:55-10:15 *Reversibility in a Constraint and Type based Logic Grammar:
Application to Secondary Predication.*
Palmira Marrafa and Patrick Saint-Dizier
- 10:15-10:35 *Uniform Processing for Constraint-based Categorical Grammars.*
Gertjan van Noord
- 10:35-10:55 *Inherently reversible grammars, logic programming and computability.*
Marc Dymetman
- 10:55-11:15 discussion
- 11:15-11:30 BREAK

SESSION 2: GENERATION (chair Gertjan van Noord)

- 11:30-11:50 *Reversibility and Modularity in Natural Language Generation.*
Gunter Neumann
- 11:50-12:10 *Reversible NLP by Deriving the Grammars from the Knowledge Base.*
David D. McDonald
- 12:10-12:30 *Syntactic choice in sentence generation.*
Lee Fedder
- 12:30-12:50 discussion
- 12:50- 2:20 LUNCH

SESSION 3: MACHINE TRANSLATION (chair Marc Dymetman)

- 2:20- 2:40 *Generation and Translation - Towards a Formalism-Independent Characterization.*
Henry S. Thompson
- 2:40- 3:00 *Reversible Machine Translation: What to Do When the Languages Don't Line Up.*
James Barnett, Inderjeet Mani, Paul Martin, and Elaine Rich
- 3:00- 3:20 *A Uniform Architecture for Parsing, Generation and Transfer.*
Remi Zajac
- 3:20- 3:40 discussion
- 3:40- 3:55 BREAK

SESSION 4: COMPUTATION (chair Henry Thompson)

- 3:55- 4:15 *Common Heuristics for Parsing, Generation, and Whatever ...*
 Koiti Hasida
- 4:15- 4:35 *A General Computational Method for Grammar Inversion.*
 Tomek Strzalkowski
- 4:35- 4:55 *Compiling Trace & Unification Grammar for Parsing and Generation.*
 Hans Ulrich Block
- 4:55- 5:15 discussion
- 5:15- 5:30 BREAK

SESSION 5: BEYOND SYNTAX (chair Patrick Saint-Dizier)

- 5:30- 5:50 *Shared Preferences.*
 Jim Barnett and Inderjeet Mani
- 5:30- 6:30 *Handling Pragmatic Information with A Reversible Architecture.*
 Masato Ishizaki
- 5:30- 6:30 *REVELATION1: A Semantic Interpreter for Systemic Grammars.*
 Tim F. O'Donoghue
- 6:30- 6:50 discussion
- 6:50- 7:00 closing remarks
 Tomek Strzalkowski

PROGRAM COMMITTEE

Marc Dymetman, *CCRIT Communications Canada*
Patrick Saint-Dizier, *IRIT Universite Paul Sabatier*
Tomek Strzalkowski, *New York University*
Gertjan van Noord, *Universitat des Saarlandes*

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