Lecture Notes in Artificial Intelligence

Subseries of Lecture Notes in Computer Science
Edited by J. Siekmann

Lecture Notes in Computer Science
Edited by G. Goos and J. Hartmanis

**Editorial**

Artificial Intelligence has become a major discipline under the roof of Computer Science. This is also reflected by a growing number of titles devoted to this fast developing field to be published in our Lecture Notes in Computer Science. To make these volumes immediately visible we have decided to distinguish them by a special cover as Lecture Notes in Artificial Intelligence, constituting a subseries of the Lecture Notes in Computer Science. This subseries is edited by an Editorial Board of experts from all areas of AI, chaired by Jörg Siekmann, who are looking forward to consider further AI monographs and proceedings of high scientific quality for publication.

We hope that the constitution of this subseries will be well accepted by the audience of the Lecture Notes in Computer Science, and we feel confident that the subseries will be recognized as an outstanding opportunity for publication by authors and editors of the AI community.

Editors and publisher

# Lecture Notes in Artificial Intelligence

Edited by J. Siekmann

Subseries of Lecture Notes in Computer Science

476

M. Filgueiras L. Damas N. Moreira
A.P. Tomás (Eds.)

# Natural Language Processing

EAIA '90, 2nd Advanced School in Artificial Intelligence
Guarda, Portugal, October 8–12, 1990
Proceedings

Springer-Verlag
Berlin Heidelberg New York London
Paris Tokyo Hong Kong Barcelona

**Editorial Board**

D. Barstow W. Brauer P. Brinch Hansen D. Gries D. Luckham
C. Moler A. Pnueli G. Seegmüller J. Stoer N. Wirth

**Volume Editors**

M. Filgueiras
L. Damas
N. Moreira
A. P. Tomás
Centro de Informática, Universidade do Porto
Rua do Campo Alegre, 823, P-4100 Porto, Portugal

CR Subject Classification (1987): I.2.7

ISBN 3-540-53678-7 Springer-Verlag Berlin Heidelberg New York
ISBN 0-387-53678-7 Springer-Verlag New York Berlin Heidelberg

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in other ways, and storage in data banks. Duplication of this publication or parts thereof is only permitted under the provisions of the German Copyright Law of September 9, 1965, in its current version, and a copyright fee must always be paid. Violations fall under the prosecution act of the German Copyright Law.

© Springer-Verlag Berlin Heidelberg 1991
Printed in Germany

Printing and binding: Druckhaus Beltz, Hemsbach/Bergstr.
2145/3140-543210 – Printed on acid-free paper

# Preface

This book contains the lecture notes prepared for the Second Advanced School on Artificial Intelligence (EAIA'90), held in the Hotel de Turismo, Guarda, Portugal, October 8-12,1990. The EAIAs are organized every two years by the Portuguese Artificial Intelligence Association. This year the focus was on Natural Language Processing.

There are some divergences between the present texts and the actual lectures. António Zampolli was most unfortunately unable to come because of health problems. António Porto kindly accepted at very short notice to replace Zampolli's lectures by presenting the last developments of his Intermediate Semantic Representation formalism, for which no text is included here. Luís Damas gave lectures on Constraint Logic Grammars, but did not produce a text for inclusion here.

It is a pleasure to thank all those who helped to make EAIA'90 and this book possible, namely:

- all the lecturers/authors for their successful effort;
- the members of the Programme Committee, António Porto, João Falcão e Cunha, Luís Damas, Luís Moniz Pereira, Luís Monteiro and Miguel Filgueiras, and also José Gabriel Lopes for their comments on drafts of the texts;
- Control Data Portuguesa, Data General Portugal, and Digital Equipment Portugal, for their financial support and provision of equipment for demonstrations;
- Banco Português do Atlântico, for its gift of course material, and
- Centro de Informática da Universidade do Porto, for its secretarial support.

*The Organizing Committee*

Miguel Filgueiras

Luís Damas

Nelma Moreira

Ana Paula Tomás

# Contents

General Introduction
*Miguel Filgueiras, Nelma Moreira, Ana Paula Tomás* ..... 1

Methods and Tools for Lexical Acquisition
*Nicoletta Calzolari, António Zampolli* ..... 4

X-Bar Theory: Its Role in GB Theory
*Inês Duarte* ..... 25

Information-Based Linguistics and Head-Driven Phrase Structure
*Sergio Balari Ravera* ..... 55

Three Lectures on Situation Theoretic Grammar
*Robin Cooper* ..... 102

Basic Aspects of the Theory of Generalized Quantifiers
*João Peres* ..... 141

The Semantics of Tense and Aspect
*Frank Van Eynde* ..... 158

Simplifying and Correcting the Treatment of Intentionality in Montague Semantics
*João Falcão e Cunha* ..... 185

Compositionality and Omniscience in Situation Semantics
*João Falcão e Cunha* ..... 206

Some Remarks on First-Order Intensional Logic
*João Falcão e Cunha* ..... 225

References ..... 235