# Lecture Notes in Artificial Intelligence

522

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

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



### J. Hertzberg (Ed.)

# European Workshop on Planning

EWSP '91, Sankt Augustin, FRG March 18-19, 1991 Proceedings

## Springer-Verlag

Berlin Heidelberg New York London Paris Tokyo Hong Kong Barcelona Budapest Series Editor

Jörg Siekmann Institut für Informatik, Universität Kaiserslautern Postfach 3049, W-6750 Kaiserslautern, FRG

Volume Editor

Joachim Hertzberg Gesellschaft für Mathematik und Datenverarbeitung, GMD Schloß Birlinghoven, W-5205 Sankt Augustin, FRG

CR Subject Classification (1991): I.2.8, J.1

ISBN 3-540-54364-3 Springer-Verlag Berlin Heidelberg New York ISBN 0-387-54364-3 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

Typesetting: Camera ready by author

Printing and binding: Druckhaus Beltz, Hemsbach/Bergstr.

2145/3140-543210 - Printed on acid-free paper

#### **Preface**

Planning – formulating a course of action – and related fields like scheduling or reasoning about action have a long research tradition in AI with many researchers all over the world working in them. Judging from text sources like the *Readings in Planning\**, it seems obvious that most of the planning research is done in the United States, but there has always been such research in Europe, too.

However, it seems that there is a communication problem among us European planning researchers: many of us are not well aware of the good work done nextdoor. There are a few national interest groups for planning (e.g., in the UK and in the FRG), resulting, to some degree, in national scenes; however, for most of us this situation is far from providing the stimulating atmosphere that seems possible when bringing together many people with different backgrounds and different experiences but with a common interest in planning.

The European Workshop on Planning (EWSP) was an attempt to provide such an atmosphere. It took place March 18–19, 1991, in GMD's Schloss Birlinghoven at Sankt Augustin near Bonn, with about 60 participants. The papers presented were selected by a programme committee; 10 of the 27 submitted papers are included in this proceedings volume.

There were actually a few more talks during the workshop than reflected by these 10 papers. The reason for that, I think, is part of our communication problem: the refereeing process showed widely different assessments of the contributions of individual papers. It is normal that referees disagree; however, the frequency and the grade of disagreement here were such that the committee decided to have a number of papers presented and discussed on which the referees disagreed considerably but which were judged to deal with interesting topics anyway. (This volume contains only papers rejected by none of their referees.)

Such differences in opinion were the more surprising as there seems to be a trend in the European planning research towards formalization of planning and action, which refutes the seemingly obvious assumption that the differences are yet another instance of a theoreticians versus practitioners squabble. There must be other reasons, and one of these might be the very lack of coherence of the European planning community.

There is a certain stress on formal planning work mirrored in the papers in this volume, which has its counterpart in a certain shortness of application work. Moreover, there are important and interesting areas related to planning that are totally missing here, e.g., plan recognition or cognitive aspects of planning. The papers submitted for and those presented at the EWSP, of which the papers in this volume are a good profile, are certainly not representative for the field of planning as a whole. But couldn't this very concentration be the germ of coherence of a *European* planning scene?

<sup>\*</sup> Allen, J., Hendler, J., Tate, A. (eds.): Readings in Planning. San Mateo: Morgan Kaufmann, 1990

I would like to thank all people who have submitted papers, independently of whether they have been accepted or not. A workshop, first of all, lives by the authors taking the time to write their ideas down and to submit. Second, a workshop lives by the programme committee and all those taking the time to referee; thanks to all the people listed below. Third, a workshop lives by support, be it moral or cash. ECCAI, GI, and GMD have supported the EWSP in one way or another; thanks to all of them. Fourth, a workshop lives by organizing lots of tiny details; thanks to all the GMD colleagues who have helped me with that. And fifth, a workshop – most importantly – lives by its participants leading lively discussions; we had these, for the benefit of us all.

Sankt Augustin, April 1991

Joachim Hertzberg

#### Programme Committee

Wolfgang Bibel, TH Darmstadt, FRG

Joachim Hertzberg, GMD, Sankt Augustin,

FRG (chair)

Hermann Kaindl, Siemens AG, Wien,

Austria

Albrecht Kellner, MBB Erno, Bremen, FRG

Erik Sandewall, Linköping Univ., Sweden

Nigel Shadbolt, Nottingham Univ., UK

Austin Tate, AIAI, Edinburgh, UK

#### List of Reviewers

Ken Currie Steffen Hölldobler

Brian Drabble Alexander Horz
Uwe Egly Frank v. Martial

Bertram Fronhöfer Siegfried Meggendorfer

Tom Gordon Han Reichgelt

Gerd Große Josef Schneeberger

## **Contents**

1
13
27
39
53
64
78
88
100
112
L