ARTIFICIAL INTELLIGENCE TECHNIQUES AND APPLICATIONS FOR CIVIL AND STRUCTURAL ENGINEERS

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Edited by
B. H. V. TOPPING

CIVIL-COMP PRESS

published by

CIVIL-COMP PRESS

10 Saxe-Coburg Place
Edinburgh

British Library Cataloguing in Publication Data
Artificial intelligence techniques and applications for civil and structural engineers
1. Civil engineering. Applications of artificial intelligence
I. Topping, B. H. V. (Barry H. V.), *1952–*
624'.028'563

ISBN 0-948749-13-X

Printed in Scotland
by
MEIGLE PRINTERS
Market Street, Galashiels

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PREFACE

This volume includes those papers on artificial intelligence techniques and applications which were presented at CIVIL-COMP 89 The Fourth International Conference on Civil and Structural Engineering Computing.

At the first CIVIL-COMP Conference in 1983, no such papers were presented. By 1985 five papers were presented on artificial intelligence applications; and in 1987 a further seventeen artificial intelligence papers were presented. These twenty two papers were published in "The Application of Artificial Intelligence Techniques to Civil and Structural Engineering" by Civil-Comp Press in 1987. At the 1989 conference thirty six papers concerned with the application of artificial intelligence techniques to civil and structural engineering were presented. It is clear that the application of artificial intelligence techniques is a major part of engineering research. Hence this separate volume and the artificial intelligence conference within CIVIL-COMP 89 was conceived. The growth of interest in this field of research is also illustrated by the large bibliography at the end of this volume.

The domains within which artificial intelligence techniques are being applied are much wider than those previously represented at CIVIL-COMP conferences. This volume includes papers on: knowledge representation and reasoning; construction management; construction planning; building design; structural analysis; structural design; geotechnical engineering and robotics. Some of the many questions concerning professional and educational issues in these fields are discussed in other papers.

The changes in our profession which will be brought about by the application of artificial intelligence will be wide ranging and what is currently state-of-the-art will, I think, be shown to be just the beginning of a major revolution in the way we make decisions. Today, expert systems provide civil and structural engineers with a range of new tools to assist with the decisions which they have to make during their professional careers. It is unfortuate that the lack of any major commercial expert system in civil engineering makes the area of research appear too theoretical for most practising engineers.

I am grateful to all the authors of papers included in this volume. In particular, I should like to thank Bimal Kumar for his collaboration in research into structural engineering design systems over the past four years.

Barry Topping
Department of Civil Engineering
Heriot-Watt University
Edinburgh

September 1989