The South African Institute of Computer Science
and
Information Technology

The 1997 National
Research and
Development
Conference

Riverside Sun
Vanderbijlpark
13 & 14 November

Hosted by

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vir Christelike Hoër Onderwys

The Department of Computer Science and Information Systems
Potchefstroom University for Christian Higher Education
Vaal Triangle Campus

PROCEEDINGS

Edited by L.M. Venter & R.R. Lombard
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Proceedings
of the
The 1997 National
Research and
Development
Conference
Towards 2000

Riverside Sun
Vanderbijlpark
13 & 14 November

Edited by
L.M. Venter
R.R. Lombard
Foreword

This book contains a collection of papers presented at a Research and Development conference of the South African Institute of Computer Scientists and Information Technologists (SAICSIT). The conference was held on 13 & 14 November 1997 at the Riverside Sun, Vanderbijlpark. Most of the organization for the conference was done by the Department of Computer Science and Information Technology of the Vaal Triangle Campus, Potchefstroom University for Christian Higher Education.

The programming committee accepted a wide selection of papers for the conference. The papers range from detailed technical research work to reports of work in progress. The papers originate mainly from Academia, but also describe work done in and for Industry. It is hoped that the papers give a true reflection of the current research scene in Computer Science and Information Technology in South Africa. Since one of the aims of the conference is Research development, the papers were not subjected to a refereeing process.

A number of people spent numerous hours helping with the organization of this conference. In this regard, we wish to thank the members of the Organizing committee, and the Programming committee who had very little time to screen the abstracts and compile the program. A special thanks goes to the secretary of the department, Mrs Helei Jooste, whose very able work was interrupted by the birth of her first child.
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On Indexing in Case Based Reasoning Applied to Pre-Transportation
Decision Making for Hazardous Waste Handling
K.L. Wortmann, D. Petkov and E. Senior

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On indexing in Case Based Reasoning applied to pre-transportation decision making for hazardous waste handling.

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Case Based Reasoning is an Artificial Intelligence technique that utilises the concept of reasoning from a stored knowledge base reflecting prior experience. It offers a number of advantages, such as learning and validation of solutions, over traditional rule based reasoning techniques in unstructured application domains.

This paper concentrates on indexing techniques tested with a view to applying a Case-Based Reasoning approach to decision support in the pre-transportation decision making phase of hazardous waste handling.

The paper first makes a brief introduction to the field of Case-Based Reasoning. A short overview of the major research areas as well as the advantages and disadvantages is given. As the major focus of the paper, theoretical and practical issues surrounding the indexing problem in Case-Based Reasoning are then covered in greater detail.

A short outline of the current decision making process at Waste-Tech (SA) is given, together with a proposed method for incorporating a Case-Based decision support system into the process.

The paper then discusses the indexing techniques designed and tested for this particular problem area. Two platforms were used for implementation and testing. Firstly, ESTEEM, a commercial Case-Based Reasoning development tool, was used to implement and test certain techniques as a control. Secondly, techniques were implemented and tested in Delphi. The discussion of techniques is followed by a description of methods used for testing them. Testing results are presented, and a discussion is included, comparing the techniques to each other and to the results of other Case-Based reasoning research.
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