The South African Institute of Computer Science and Information Technology

The 1997 National Research and Development Conference

Riverside Sun
Vanderbijlpark
13 & 14 November

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

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L.M. Venter
R.R. Lombard
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The views expressed in this book are those of the individual authors
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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A Java-implemented remote respiratory disease diagnosis system on a high bandwidth network

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October 6, 1997

This telemedicine project is a proof of concept for a remote respiratory disease diagnosis computer system, operating over a high bandwidth network, implemented in Java TM.

It hopes to increase medical health in South Africa, by aiming to make available specialist respiratory disease consultation online from teaching hospitals to the remote secondary level hospitals or clinics.

We wish to investigate the different modalities required for remote diagnosis of patients, how they can be used in a diagnosis session, and whether Java can be used to provide an acceptable medical diagnostic environment for remote areas.

For a diagnosis, consultants require real-time, high-resolution video of the patient's torso, to talk to the patient and the health care provider on site, to view scanned X-Rays, to listen to the output from a radio-stethoscope, and to view some simple test results. Thus 2 different cameras will be used, and data from video patient examination, a real-time audio and visual videoconference, x-ray images, digitised audio, and some plain text will form multiple streams entering a server to be transmitted to the consultants' for their use. Of course the consultants will be generating video-conferencing data as well.

The areas chosen to implement the system provide different network lines with different bandwidth, ie 64 K Diginet and high speed frame relay.

Java, a new programming language, from Sun Microsystems was chosen as primary development language because it promises machine independence, networking capabilities and reduced development effort for diverse computer platforms. It will be used for server and user interface code. C/C++ will be used for device dependent procedures, like video capture etc.

Once a system is developed, testing will be done for performance on the different bandwidth lines, usability, accessibility, feasibility and scalability.

It is envisaged that the components developed as part of this thesis project will be scalable, thus facilitating the implementation of such a National Interactive HealthCare Network.