

IFIP Workshop on Virtual Environments

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1 WORKSHOP OVERVIEW

The IFIP WG 5.10 Workshop on Virtual Environments was organised by CCG/ZGDV (Computer Graphics Center - Coimbra - Portugal) and was held at the Comissao de Coordenacao da Regiao Centro, in Coimbra, Portugal, on October 24-25, 1994. The workshop chairman was Prof. Dr. Jose Carlos Teixeira, CCG/University of Coimbra, and the Programme Committee joined scientists of high repute from nine countries. From the submitted contributions, the Program Committee selected twelve to be presented during the workshop. The workshop had 56 attendees from six countries (Brazil, Germany, Portugal, Spain, UK and USA). The main topics that had been proposed for the workshop were: Human Factors, Software Architectures, Modelling Tools and Techniques, Input and Output Devices, Interaction Techniques, Distributed Systems, Cooperative and Multi-User Systems and Applications.

The workshop devoted the first day to invited contributions and practical demonstrations and the second day to original papers and a final invited presentation. The invited speakers were: Mathias Wloka (Brown University, USA), Pierre duPoint (Division Limited, UK), Kirk Woolford (Academy of Media Arts, Germany) and Dr. Martin Goebel (IGD, Germany). Mathias Wloka described interaction techniques and discussed approaches to improve user participation in virtual environments. Virtual reality and promising applications for virtual environments were addressed by Pierre du Point from the application and commercial point of view. Among other applications, concurrent product design, automotive concept design, visualisation of architectural models and maintenance planing where presented. Kirk Woolford discussed tactile dialogue in networked environments and the development problems that have to be solved to enable touch feeling. The participants could feel the position of other visitors through physical stimuli; afterwards, it was discussed how this new approach could be used in industrial applications. The last invited presentation by Dr. Martin Goebel presented Virtual Environments as a new opportunity to improve industrial applications, and some approaches to solve technological problems. Examples of the use of Virtual Environments in industry were also discussed, as well as the technology improvements which should be expected. The presented papers were organised in four sessions:

- Simulation and Interaction in Virtual Environments
- Concepts and Tools
- Virtual Environments for Production
- Distributed Environments.

In the Simulation and Interaction in Virtual Environments session the three papers presented dealt with simulation support for virtual environments, motion planning for a mobile robot and the use of solid modelling in virtual environments. The use of distributed systems and different types of constraints were discussed and the results of the developments were presented.

In the Concepts and Tools session virtual reality was framed in the historical development of the reality representation techniques, the sensorial immersion problem was discussed and a new approach to real-time rendering was presented.

The importance of Virtual Environments for Production was discussed based on three perspectives: virtual prototyping, concurrent engineering and virtual manufacturing. The impact and opportunities of virtual prototyping environments for the industry and an architecture for supporting real-time collaboration in concurrent engineering within a distributed virtual environment were presented and discussed.

In the last workshop session, characteristics of large distributed virtual environments were discussed, as well as the use of 3D displays to perform application tasks, and the problem of high degree of realism and speed in virtual environments.

A virtual environment is an interactive computational space where the visitors interact directly with the models in an intuitive way. The interface and the support functionalities enable a direct communication between the user and the environment and increase the work productivity of the user. A virtual environment allows an user control of the space, time and viewing perspective. Therefore, some application areas (e.g. CAD, molecular modelling, urban planing, medical surgery, games, pedagogic software and tele-presence) are increasingly using virtual environments. We found the discussion of basic virtual reality technologies very important to better understand their application, as well as the problems and possibilities of virtual prototyping.

The participants classified the workshop as very interesting, since it combined the state of the art invited talks with hands-on demonstrations and research papers. The discussions during the workshop showed very well the high level of the speakers and attendees and the actuality of the work presented.

2 PROGRAMME COMMITTEE

P. Bono (FhG-CGRG, USA), P. Brunet (Univ. P. Catalunya, E), S. Bryson (NASA, USA), R. Earnshaw (Univ. Leeds, UK), J. Encarnaçao (GRIS, D), B. Falcidieno (IMA, I), A. Figueiredo (Univ. Coimbra, P), M. Gigante (RMIT, Australia), M. Goebel (FhG-IGD, D), G. Grinstein (Univ. Massachusetts, USA), M. Gross (ZGDV, D), R. Hubbard (Univ. Manchester, UK), T. Kunii (Univ. Aizu, Japan), L. Magalhaes (Unicamp FEE-DCA, Brasil), J. Rix (FhG-IGD, D), J.C. Teixeira (CCG/ZGDV, P), A. Wexelblat (MIT, USA)