

Report on the Fifth International Conference in Central Europe on Computer Graphics and Visualization (WSCG'97)

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Abstract

From February 10 - 14, 1997 I attended the Fifth International Conference in Central Europe on Computer Graphics and Visualization (WSCG), held in cooperation with the IFIP working group 5.10 on Computer Graphics and Virtual Worlds.

This report on the Conference was prepared for the organisations that supported my attendance and the MA research tour that followed.

Participation in the Conference was made possible with assistance from Arts Victoria; Faculty of Visual Arts, RMIT University; Centre for Animation and Interactive Media, RMIT University; the Australian Network for Art and Technology; and Toy Satellite.



Fig. 1 WSCG'97 attendees

From February 10 - 14, 1997 I attended the Fifth International Conference in Central Europe on Computer Graphics and Visualization (WSCG), held in cooperation with the IFIP working group 5.10 on Computer Graphics and Virtual Worlds. The University of West Bohemia, Plzen, capital of West Bohemia and home to the infamous Czech beer, Pilsen Urquell, hosted the conference.

International participants arrived over a two-day period, filling both Hotel's Slovan and Central. Many were old hands at the WSCG, but this year Plzen had attracted far more participants than ever. Conference organiser, Professor Vaclav Skala, had disseminated conference information via the Internet, which took his original postings further than he had anticipated.

WSCG attracts some of the most talented scientists working in the field of computer visualisation, but the obscure location and often esoteric nature of its subject matter may do more to deter participation than encourage it. To my mind, this actually contributed to making this an engaging conference where information - often difficult to digest in print - was exchanged in lively and creative face-to-face formal and informal exchanges.

Of the 100 or so participants to the conference, I discovered I was the only, and perhaps the first, artist to not only participate, but present a paper at the WSCG. In addition, I was also the first Australian to attend, although several had contributed papers and materials for poster sessions in previous years. Traditionally, the WSCG attracts researchers and computer visualisation scientists from Europe and the US, from University's and other research institutions. It is recognised that the arts has played a significant role in both the creative use and commercialisation of computer visualisation tools. However, in conferences such as WSCG, the arts are rarely seen as a contributing factor to their development. This perception, since my participation, is changing.

Topics covered at WSCG 97 included research in: fundamental compression algorithms; rendering and visualisation; virtual reality; animation and multimedia; medical imaging; geometric modeling and fractals; graphical interaction; object-oriented graphics; standards; computer vision; parallel and distributed graphics; computational geometry; computer-aided geometric design; CAD/CAM; DTP and GIS systems; educational aspects of related fields; and usage of graphics within mathematical software in education.

Although many of the presentations covered topics that were far too esoteric for me, I was able to learn a great deal about the machinations of visualisation technologies, in particular their application within the arts.

Day one opened with a paper from Philippe Blasi and Charles Wuethrich (Faculty of Media, Bauhaus University, Weimar, Germany) on a *Realistic Rendering Algorithm for an Intuitive Interpretation of 3D Scalar Fields*. The authors presented the results of their research proposing that their algorithm would render smooth surfaces based on "volume visualisation" without "restrictive assumptions about the characteristics of ... arbitrary phase functions."

The day ended with a paper from Dr Roni Yagel, Department of Computer and Information Science, Ohio State University, titled, *Towards Virtual Surgery: Goals and Achievements*. This presentation provided an informative insight to developments in remote surgery and haptic feedback - a system that will "deliver appropriate forces and torque's to a surgical tool, in order to simulate the physical sensations associated with performing an operation." Popular amongst leading otolaryngologists, Dr Yagel and his colleagues are particularly interested in the development of such tools for Endoscopic Sinus Surgery.

During the course of his presentation, I asked whether remote surgery would be compulsory or elective. Dr Yagel made it clear that in most cases, it would be elective, but it would depend on geographical circumstances, the condition of the patient and whether reliable bandwidth is available. He suggested that we are at least 2 decades or more away from this kind of scenario, although remote actuation is not uncommon amongst artists.

Haptic feedback tools are also being created at MIT. Safety devices, a VRML Plug-in and Haptic Rendering for virtual environments are part of a new suite of projects being developed in collaboration with the US-based company, Triptych Design. Haptic Feedback research in Australia is underway in the following institutions:

- Advanced Data Technology Laboratory, Australian National University;
- Advanced Computational Modelling Centre, University of Queensland.

Composer and lecturer Lonny Chu has explored haptic feedback for use in live performance of electronic music. His 1996 paper, *Haptic Feedback in Computer Music Performance*, is published in the Proceedings of the 1997 International Computer Music Conference, ICMA CA, 1997.

On the following day, Assistant Professor, Bedrich Benes, Department of Computer Science, Czech Technical University, opened the late morning session with an engaging description of his research, *Fast Estimation of Growth Direction in Virtual Plants Simulation*. Benes described development in imaging software that could be used to *grow* 3 dimensional organic objects such as plants or trees, and render them according to the conditions of their environment. In short, "a new method for fast determination of growth direction of the growing elements in artificial plants..." It was envisaged that such software could be applied to urban planning and design - finding the most suitable location for plant life to thrive. I wondered whether this could be applied to humans as well?

Before we broke for lunch, it was my shift at the lectern. Billed as a "special presentation", I presented my paper, *Towards Collaborative Development of Interactive Sound and Image*, along with generative (music that mutates and is never heard the same twice) soundscapes, an animated Web-browser based presentation. Although impossible to find a single computer on campus with a Wave Table sound card (required for the demonstration of generative music software) I delivered a thorough and entertaining lecture, finishing off with a digital animation sequence from Melbourne artist, Troy Innocent's *Psy Vision*.¹

During the course of the presentation, I identified specific projects where the development of multimedia imaging is occurring in concert with interactive music technologies - a brief insight into the contribution being made to multimedia research by these artistic endeavors. In particular I highlighted the work of graduates of the Centre for Animation and Interactive Media, and other Victorian artists (Kim Bounds, John Power, Troy Innocent, Elena Poppa, Moira Corby, David Cox).

My lectures tend to be lively, but no more lively than the outburst from a gentleman who, almost immediately after I had finished, proceeded to accuse me of "killing [his] imagination," suggesting that all the effort gone into the development of imaging software added up to zilch if what I showed was all artists could muster. This evolved into the liveliest debate of the entire week, finishing up with unanimous support for further collaboration between artists and computer scientists.

It is within the tradition of research where science and art often co-exist. Artists such as Stelarc work with medical practitioners, robotics engineers and more recently, specialists in distributed networking, multimedia and sound. He has created a series of installation and performance pieces that are interactive, that engage the use of both state-of-the-art muscle and sensory stimulation devices and remote-user interaction. The collaboration, in the case of Stelarc, is an ongoing research environment between a number of specialist science and arts practitioners.

¹ Innocent, T 1997, *Psy Vision*, Psy-Harmonics.

It was clear that both artist and computer scientist often work in isolation from each other, infrequently finding opportunities to work on software or image development. My heckler, bless him, wasn't so much frustrated by the work that I presented, but by what he perceived as an inadequate realisation of *his* vision. He knew what his own research was capable of producing, but had no vehicle through which his knowledge could be channeled through to users of his work.

The bridge between his world and ours is a tenuous one, one that is rarely crossed unless, more often than not, commercial opportunities encourage it (e.g. Hollywood). The WSCG broke an unspoken convention by allowing me to present a paper, the first draft of which was rejected by the review committee for not being technical enough. The final version was accepted, but it was clear that the conference organisers wanted to make a clear distinction between my paper (a "special presentation") and everybody else's. In the end, I felt this worked to my advantage.

It was clear that a gulf persists between the digital arts and computer sciences, but one that can undoubtedly be bridged. In my own way, I have kept in contact with several of the conference participants, three from Germany and another from the UK. We exchange information via email and generally keep each other informed of our activities and those of our peers. Each of us benefited personally from the WSCG. Collectively, we grew to appreciate and respect the contribution we make to each other's work. Many WSCG participants were grateful for the eye into the world of the artist, an opportunity to see and hear first hand the product of their scalar fields, optimal ray shooting algorithms, radiosity estimators and isotropic clusters.

For an Australian artist in Europe, it was not only about information exchange, it was perhaps more about personal learning and *spiritual* immersion in a cultural climate we all too often neglect. Australia may well one day be recognised as an Asian country, but for many of us with northern blood, our hearts, language and cultural spirit still permeates through European soil. Our challenge is to embrace the opportunities of the present, whilst sustaining some semblance of the cultural heritage we carry by way of language and the arts.

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