U.K. Bristol

University of Bristol

Graphics Group
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Core Competence

High Fidelity Rendering, High Dynamic Range, Global Illumination, Visual Perception, Psychophysics, Parallel Rendering, Archaeological Site Reconstructions, Virtual and Augmented Reality Environments, Acoustic Rendering

Head of the Institute
Alan Chalmers

History

The group started in 1989 looking predominantly at parallel rendering. In 1992 we started investigating high fidelity reconstructions of archaeological sites and have now worked on sites in the UK, France, Malta, Czech Republic, India and South Africa. In 2000 our animation considering whether prehistoric people in France 25,000 years ago were making "animations" was shown at the SIGGRAPH Electronic Theatre. The Graphics Group at Bristol has hosted the Eurographics Rendering Workshop in 1992, Eurographics Parallel Graphics & Visualisation Workshop in 1996 and the ACM SIGGRAPH-Eurographics Workshop on Computer Graphics Education in 2002. In 2001 ArchLight (www.archlight.co.uk) was established to develop very realistic archaeological reconstructions for museums. Computer Graphics has been taught in Bristol since 1989. Seven PhD students have completed their studies with the group, six are

currently registered and four more are due to start in October 2002.

Staff

1 Reader: Alan Chalmers
2 Research assistants: Patrick Ledda, Peter Longhurst
4 PhD students: Kirsten Cater, Kate Devlin, Roger Lo, Ioannis Roussos

Rooms and Locations

The group occupies one research room and has a separate psychophysics lab

Financing

The University of Bristol funds the space and staff. The research assistants are funded by a European project, ARIS and the PhD students by a number of funding agencies. Travel funding has come from the British Council and the Bristol-Bordeaux Twinning Association.

Current Structure and Important Partners

The Computer Graphics group is part of the Digital Media research group in the Department of Computer Science, which also includes computer vision and speech processing. The Graphics Group group also works closely with

the Departments of Psychology, Archaeology and History of Art within the University of Bristol, and a number of archaeologists around the world.

Current Research

Current research is focussing on (Perceptual) Realism in Real-Time. This work incorporates psychophysical experiments to quantify the perception of objects in the real world and the same objects in the virtual reconstruction of the real scene. A framework has been developed from which the "realism" of a synthetic image can be compared with

the real scene it is intended to portray. Furthermore, y identifying those areas of an image which are perceptually important to the human user, and those which are not, computational effort can be directed efficiently resulting in perceptually similar images in significantly reduced computational time. Visual perception and parallel processing together offer the possibility of achieving high fidelity images for virtual environments in reasonable (and perhaps even

real) times. We are using the results of this research to help archaeologists develop computer based approaches to enable the investigation of complex hypotheses concerning the archaeological record in safe, non-destructive and controlled environments.

Important Recent Project Participations

- ARIS: EU-IST project: aris-ist.intranet.gr/
- INSITE: British Council funded projects to Malta, South Africa, France, India and Czech Republic

Important Recent Industrial Partner

ArchLight

Future of the Lab

The Bristol Computer Graphics group will continue to investigate the synthesis of highly realistic images and parallel rendering, working towards the "holy grail" of Realism in Real-Time. We will also consider multi-sensory virtual environments and how these may affect the perception of archaeological and heritage sites.