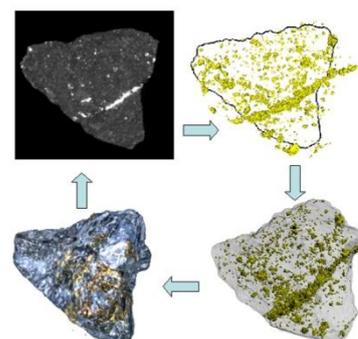# 3D Visualisation: a Continuing Discussion

Monday June 13th 2011

12.00 noon to 4.00 pm

Venue: ARRC Auditorium, 26 Dick Perry Avenue, Kensington, WA

Following on from the symposium of 11th April 2011, the aim of this meeting is to present both applications and research into visualisation for scientific and educational and artistic purposes. In a discussion session we will consider how these examples might offer inspiration for further research, development and application.

Presentations

Time		Speakers
12.00 – 12.30	Refreshments	
12.30 – 1.00	Welcome	Valerie Maxville Education Program Leader, iVEC
	Introduction	Suzette Worden Professor of Design, Department of Design, School of Design & Art, Curtin University Tony Rickards Senior Lecturer, Science and Mathematics Education Centre, Curtin University
1.00 - 2.15	Presentations	*Visualising the Brain with EEG* **Tele Tan** Associate Professor, Department of Computing, Curtin University *Dynamic Depictions Distract* **Ric Lowe** Professor of Learning Technologies, School of Education, Curtin University *Art, Philosophy and Positional Computation* **Chris Thorne** UWA, Curtin University, VRShed Pty Ltd
2.15 – 2.30	Break	
2.30 – 3.20	Presentations	*Auspex Australis - an Art and Science Collaboration* **David Carson** Inter-media artist, Fremantle, WA *Stereoscopic Imaging: Reporting on Work in Progress* **Andrew Woods** Research Fellow, Centre for Marine Science & Technology, Faculty of Science & Engineering, Curtin University
3.20 – 4.00	Discussion	• Further application and collaboration • Practical outcomes • Evaluation of people's perceptions of learning environments
4.00	Close	

Abstracts

Visualising the Brain with EEG

Tele Tan
Associate Professor, Department of Computing, Curtin University

Presentation

Electroencephalography or more commonly known as EEG directly measures the electrical activities of the brain without risks of radiation inherent in magnetic resonance imaging technologies. This talk presents some of the research works carried out to understand the physiological and cognitive responses of individuals when performing perception related activities. Specifically, we will show the determination of eye gaze and quantification of visual target spotting efficacy through processing and analysis of multi-dimensional EEG signals.

Tele Tan

Associate Professor Tan received his B.Eng (First Class Hons) and PhD degree from University of Surrey in the UK in 1990 and 1993 respectively. He has well over 15 years of research and development experience in the fields of computer vision, large scale spatial and temporal data analysis and multi-modal processing. He pioneered the approach of using image synthesis techniques to improve the performance of face recognition systems. This approach makes it possible for face recognition systems to be deployed in outdoor and uncontrolled environment while still maintaining high accuracy performance and low error rate.

An interest in physical security allows Tele to explore the benefits of deploying security risk management processes to plug the gaps of security technologies pitfalls. One of his current research interests concerns using modelling and simulation techniques to perform security risk assessments to protect and secure large scale and complex infrastructures.

Dynamic Depictions Distract

Ric Lowe
Professor of Learning Technologies, School of Education, Curtin University

Presentation

With the increasing processing power of visualisation computers has come a shift from static graphics to their dynamic counterparts. Popular wisdom has it that animation's explicit depiction of temporal change is superior to the implied dynamics represented in static graphics. However, recent research suggests that the introduction of dynamics into an

information graphic brings with it human processing challenges that are largely ignored in current visualisation design. This presentation will identify the source of these challenges and discuss their consequences for comprehension of animated information.

Ric Lowe

Ric is responsible for Humanities Faculty programs in Learning Technologies and Educational Design from undergraduate to doctoral level. A particular emphasis in these programs is the innovative use of visual materials in technology-based learning. His specific research Interests include: animations and multimedia learning, visual literacy and learning, learning from pictures and diagrams in education.

His consultancies involve the design of high quality educational materials (pictures, diagrams, animations, etc.) for a wide range of clients including industry, schools, universities, museums, professional organisations and community bodies. He specialises in technological applications of cognitive learning principles to the development of effective educational resources e.g (http://www.cbt.com.au/).

Art, Philosophy and Positional Computation

Chris Thorne
UWA, Curtin University, VRShed Pty Ltd

Presentation

Changes must be made to our thinking in order to design computer systems that avoid unexpected, unexplainable glitches and also achieve optimal accuracy. A holistic approach to addressing these issues is presented.

Chris Thorne

Chris divides his time between teaching and learning activities at The University of Western Australia (UWA), Curtin University and 3D graphics visualisation projects through his company VRShed Pty Ltd (http://www.vrshed.com). His recent PhD was in high fidelity simulation and Masters research was in computer graphics.

In 2010 Chris lectured in Human Computer Interaction and Design at the School of Computer Science and Software Engineering, UWA, where he also has tutor and demonstration duties. Chris heads the UWA Google Earth 3D Campus Project and the earlier UWA Virtual Universe Project: a Web 3D virtual world which includes the campus grounds. He is a principle creator of the UWA Second Life project. Chris also developed a virtual teaching and learning environment for the School of Business Law and Accounting, Curtin University. He currently holds the position of Research Associate, School of Physics, UWA.

Chris has extensive experience of developing 3D visualisation projects, including the 3D geospatial engine behind the planet-earth.org project, which at one time was on par with the early Google Earth, and the Rez terrain generation package. He is also experienced in the integration of web services with online 3D applications, presenting papers at conferences, including SIGGRAPH, Graphite and Cyberworlds. His UWA team won the 2007 Google Australia-New Zealand virtual campus competition. He has developed flight/temporal geospatial information simulation using NASA's Worldwind globe framework for Geoscience Australia and runs one or more UWA education outreach activities each year.

Auspex Australis - an Art and Science Collaboration

David Carson
Inter-media artist, Fremantle, WA Inter-media artist, Fremantle, WA

Presentation

David will talk about his last major project, Auspex Australis - an art and science collaboration between artists, musicians and environmental scientists studying bird ecology on Christmas Island in the Indian Ocean. This experimental inter-media project draws on scientific research carried out by Dr Janos Hennicke and his colleagues at the Pink House Research Station on Christmas Island. Dr Janos Hennicke is a research fellow at the Chizé Centre for Biological Studies in France

The project resulted in a full dome presentation over three evenings at the Horizon Planetarium in Perth during National Science Week. The performance of Auspex Australis included visualisation of bird flight data by Carley Tillett, live music written and performed by sound artists' Phil Mouldycliff and Colin Potter from the UK. Dr Janos Hennicke, began the event by outlining his research and the global significance of the Christmas Island seabird project. David Carson developed this project after being awarded a Connections Residency Program Grant from the Inter-Arts Office of the Australia Council for the Arts.

David Carson

David Carson is an inter-media artist based in Fremantle Western Australia. He moved to Australia from the UK in 1995 teaching fine art in various art schools before becoming a full time artist concentrating on new imaging technologies such as stereo 3D. Over the past decade he has collaborated with many art and science organisations on projects including the world's first successful filming of the Aurora Borealis in 3D, in association with UK videographer Brian McClave. This was during a residency at the Sodankylä Geophysical Observatory in Lapland, Finland in 2002. He has undertaken numerous residencies including, Horizon - the Planetarium in Perth, Kalgoorlie Consolidated Gold-Mines, the Department of Energy and Resources at the Innovation Centre, Bentley and the Arts and Culture Centre on Christmas Island.

Stereoscopic Imaging: Reporting on Work in Progress

Andrew Woods
Research Fellow, Centre for Marine Science & Technology, Faculty of Science & Engineering, Curtin University

Presentation

This presentation will provide an overview of 'work in progress' for Stereoscopic imaging. Practical applications will be discussed, demonstrated and placed in context.

Andrew Woods

Andrew Woods is a Research Fellow with the Centre. His research interests include Stereoscopic Imaging, Stereoscopic Video, Underwater Technology and Remotely Operated Vehicles (ROVs). He is co-chair of the annual Stereoscopic Displays and Applications Conference. He was Director of the Centre for Marine Science & Technology from 2002 to 2004 and was a winner in the 2007 Curtin New Inventor Competition for his Mini-3D underwater stereoscopic video camera. Andrew has ben elected to Fellow status by SPIE, the International society for optics and photonics, for his achievements in stereoscopic 3D displays and applications, and undersea stereoscopic camera design.

All Welcome

RSVP – for catering purposes – email: rsvp@ivec.org or call 6436 8830 with your name and contact details.