Challenges to Applying Virtual Reality Technology and Techniques to Visual Analytics

Panelists:

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Summary

Visual analytics is the science of analytical reasoning facilitated by interactive visual interfaces. It has grown out of and is strongly related to information visualization. Visual analytic tools assist analysts in detecting the expected and discovering the unexpected from complex, noisy, incomplete, heterogeneous, and sometimes deliberately deceptive data.

VR/AR research has claimed for years to provide the potential for more effective environments to understand and explore information spaces. This would seem to make VR technology a natural for application to visual analytics. However, visual analytics is focused on the analytical process not the tools and technology. As such, any new methods, techniques, and technologies need to show benefit to analysts working on real problems. Additionally, the majority of visual analytics research funding is not focused on disruptive physical interface technologies. Generally speaking, new technologies and techniques for visual analytics need to function within the current analytical environment.

The purpose of this panel is to introduce the domain of visual analytics to the audience and explore how and where VR/AR research can be adapted for use in visual analytics. The panelists have been selected based on topic areas of research that have potential for near term insertion or impact on visual analytics. This panel will focus on the hard issues of defining what it will take to get VR technology introduced into the visual analytics research funding stream.

Defining Appropriate Technology Niche Areas

What areas of the visual analytics process have the best opportunities for VR/AR related technologies? Examples could revolve around non-tethered tracking technologies or tiled-display workspaces. Topics could also focus on VR technologies/techniques for use in sense-making methodologies.

How Are Vr Technologies Appropriate For Visual Analytics

It is not enough to just define why one technology or technique is better than another. This has to be put in context of the visual analytic process. How can these proposed VR/AR technologies really support the analytical process better that the tools analysis have now.

Can Vr Technology Really Deliver Or Not

Finally (and maybe the hardest) we need to ask the question of when and how easily the technology could be placed into a real-world environment. How would it impact that environment? Is there a way to reduce the impact of introducing the technology? This includes issues of workflow and process but also space and financial considerations.

All of these will be pursued through presentations and open discussions. The panelists will address each of these topics in their slides and relate them to specific technologies/techniques/interests they believe have the best near term opportunities in visual analytics.

Biographical Sketches

Richard May, PhD has been working in the computer graphics field for over 16 years. Currently he is on the core team for the DHS National Visualization and Analytics Center directed by Jim Thomas. He is the R&D coordinator and Education director. Since 1997 he has been developing an augmented reality system using video cameras to track people and objects for computer control. Among other things, this technology was used in an exhibition at the Seattle Art Museum in 2001. The exhibition was used by over 25,000 attendees. He also co-managed the design and building of a 100 seat state-of-the-art auditorium along with a 12 station graphics and visualization lab for an environmental molecular sciences center.

Pamela Arya is an Executive Director for Applied Minds, Inc., a research and development company creating a range of new products and services in software, entertainment, electronics, biotechnology and mechanical design. The company also provides advanced technology, creative design and consulting services to a variety of clients. Her areas of interest include Multi-Int Fusion, Advanced Visualization and Geospatial Concepts, knowledge man-

agement and information architectures. Her most recent projects include the development of the TouchTableTM and an advanced Integrated Analytic Environment. She was awarded the IEEE Computer Society Outstanding Contribution Award for her work on interoperable data structure standards. She attended Brown University and received a BS in geo-physics. She then received an MS from The Johns Hopkins University in Computer Science.

Doug A. Bowman is an Associate Professor of Computer Science at Virginia Tech, where he directs the 3D Interaction Research Group and is a member of the Center for Human-Computer Interaction. His research interests include 3D user interfaces, interaction techniques for virtual environments, the benefits of immersion, and large high-resolution displays. He is a co-author of the book 3D User Interfaces: Theory and Practice, and was awarded a National Science Foundation CAREER grant. He received his MS and PhD from the Georgia Institute of Technology.

Greg Schmidt is a research scientist at the 3D Virtual and Mixed Environments Laboratory, Naval Research Laboratory. He has a PhD and MCS in Computer Science from Texas A&M University studying computer graphics and gesture recognition. He has conducted research in large-scale visualization, GIS, situational awareness, event detection, interaction for AR, and uncertainty, forest and medical visualization. He has been the PI for projects involving event detection, uncertainty visualization, and medical visualization. Recent publications include spatial audio work at I3D 2005, gesture recognition research in Springer-Verlag Lecture Notes, and uncertainty visualization on the cover of CACM (Aug. 2004) and in IEEE CG&A (Sep. 2004).

Alan Sullivan, PhD is Founder, President and CEO of LightSpace Technologies, Inc. LightSpace's unique DepthCube Volumetric 3D Display technology produces physically deep 3D images for applications in medical and scientific visualization, oil and gas exploration and extraction, baggage and cargo scanning and computational engineering. Prior to founding LightSpace Technologies, he was Vice President and Chief Technology Officer of Vizta3D, Inc. (formerly Dimensional Media Associates, Inc.). He joined DMA in January 1996 where he developed the DepthCube technology from an initial concept to a commercial product. LightSpace acquired the DepthCube technology from Vizta3D in 2003.