

screenmedia

digital signage • digital out-of-home • convergent media magazine

incorporating ddr magazine

august/september 2013

issue 4 volume 10

£7.00

Ultimate Screen Drivers: Panoramic Experience Delves Deep Into Data

- Walking on Water
- The Writing's on the Wall
- UK Exhibition Scene Sought!
- Orchestrating Retail's Tune
- Making Mobile Shopping Count
- Conflict Minerals: Stepping Up to the Mark
- The Future of OOH is People



www.screenmediamag.com



Panoramic Experience Delves Deep Into Data

Scientists and engineers interact naturally with big data in the world's highest resolution immersive display, driven by AMD FirePro professional graphics cards.

Imagine for just one moment that you have 20:20 vision and there is absolutely no need to pan and zoom. If you want to see something in detail, then you simply walk right up to it and then take a step back to understand the context. In this scenario, you are engulfed by data and there's a total of 1.5 billion pixels at your disposal, enabling you to connect with information on a gigantic scale.

You can readily explore astronomical phenomena, the infrastructure of a building or even the composition of a molecule. You are in Stony Brook University's Reality Deck, the home of the world's first gigapixel resolution immersive display!

In this room measuring 9x33ft, every inch forms part of a high resolution screen, even the door. There are 416 HD flat panel monitors, each measuring 27in wide and displaying content at resolutions beyond that of standard HD 1080P television, which itself boasts more than two million pixels.

This university facility shapes up as the ideal venue for scientists, researchers and engineers to interact naturally with experimental data and supercomputer simulations. "Specialists in every discipline are facing ever-expanding amounts of data but they never had the ability to look inside the information accumulated," explains Dr Arie Kaufman, PhD, distinguished professor, chair of the Department of Computer Science, chief scientist of CEWIT and Project Director for the Reality Deck. "We wanted to create an environment that enables data analysis through visualisation."

Graphic super-computing

The Reality Deck is funded by a National Science Foundation grant with matching funds from Stony Brook University, and is situated within the University's Centre of Excellence in Wireless & Information Technology, CEWIT, on Long Island in New York State.

For Dr Kaufman, the Reality Deck is a dream come true. "I have been working on it for more than a decade," he enthuses. "In terms of acuity, I wanted to overcome the limits of the human eye and I envisaged an immersive and co-operative exploratory experience. This meant that the installation had to be panoramic: it also had to be large enough to accommodate a group of people. So from the start, the requirements began to get rather complicated."

Stony Brook University recognised the potential value of this concept and provided support as staff, students, patrons and partners began working to turn an ambitious idea into reality. It was clear that multiple displays would be required and one of the main considerations was the best way to incorporate enough graphics processing power to drive the displays. Yet they had to operate efficiently within a restricted space.

"When we discovered high performance AMD FirePro professional graphics cards with their six display outputs," says Dr Kaufman, "we knew we had the answer!"

The Reality Deck incorporates some 416 customised Samsung displays, with each 27in screen running at a

Reality Deck, a 416 screen research installation powered by 72 AMD ATI FirePro V9800 professional graphics cards, provides the ultimate panoramic computing experience.

Stony Brook University's Reality Deck, the ultimate screen installation built to deliver deep research answers, checks out the Milky Way.

native resolution of 2560x1440 pixels. Notably, 72 ATI FirePro V9800 graphics cards power the Reality Deck screens, and each of these cards is capable of driving up to six displays. Eighteen ATI FirePro S400 synchronisation modules also feature in the system to keep video and images in alignment across all 416 displays.

"The Reality Deck experience is phenomenal," continues Dr Kaufman. "The first time we turned it on, we were simply flabbergasted by the effect, even though we were missing the bottom row of panels at that point. The resolution is tremendous: it really saturates the eye. In fact the processing power is approximately two teraflops, that's a trillion floating point operations per second, which is twice the processing power of the super-computer we have here on campus."

Visual analytics future

The university facility is now being heavily used for a range of applications from cosmology and weather prediction to firefighting, drug design and clean room simulation. According to Dr Kaufman, the number of applications in the university's Reality Deck is growing all the time.

"Data is like geometry," Dr Kaufman concludes, "and when you can look at it from any angle it is easy to integrate and analyse. In our super-high resolution virtual reality surround view theatre, we can soar over a city yet discern minute detail such as license plates. We can walk around as images update behind us like an infinite canvas. AMD's FirePro workstation graphics are central to this immersive experience."

Meanwhile Dr Kaufman and his team continue to enhance their exciting screen based facility. Now, they are working on improving the mechanism that allows the picture to be updated behind viewers and they are refining a system that tracks a user's hand and head movement to make interactivity an even more natural event.

Stony Brook University is entrenched in education and research and embarked on the inspirational business opportunity to create the highest resolution immersive display ever built to support research and to visualise vast amounts of big data. The solution it turned to in order to drive the concept was AMD's FirePro workstation graphics featuring multiple display outputs.

The university's Reality Deck supports its international reputation for innovation and with the first gigapixel display in the world, that reputation is enhanced. The screen installation driven by the FirePro workstation graphics provides intense acuity with its 416 HD displays. The stunning result delivers panoramic immersion, enabling extensive visual analysis.

Multi AMD FirePro graphics experience

Notably, 72 ATI FirePro V9800 graphics cards power the Reality Deck and each of these cards is capable of driving up to six displays. AMD Eyefinity multi-display technology integrated in the graphics card provides the ability for each V9800 to support up to six DisplayPort monitors on each enabled graphics card. The 18 ATI FirePro S400 synchronisation modules essentially maintain video and image alignment across all the displays.

AMD Eyefinity supports multiple, independent display outputs simultaneously, delivering innovative graphics capabilities and enabling massive desktop workspaces. The latest generation of AMD FirePro graphics cards can support 3, 4, 5 or 6 displays for the ultimate panoramic computing experience. By expanding field of view across multiple high resolution displays, more detail than ever is apparent, with



AMD's ATI FirePro V9800 professional graphics card, a powerful graphics solutions for intensive data processing and blazingly fast performance.

efficient multi-task management, viewing more data, applications, and images at once.

AMD Eyefinity claims, and in the Reality Deck installation proves, a superior visual experience for demanding 3D applications. The multi-screens under its control can be landscape or portrait orientated, grouping them into a single, large integrated display surface, running windowed, full screen 3D, video and more. Each screen maintains its independency for setting display resolution, refresh rate and display rotation.

AMD's ATI FirePro V9800 professional graphics card is blazingly fast, with its 1600 stream processors and 4GB of GDDR5 memory on board for easily processing large and complex datasets.

The latest generation of AMD FirePro professional graphics cards are built using innovative all-new Graphics Core Next, GCN, architecture allowing them to effortlessly process challenging computational workloads and to drive large multi-monitor display wall applications featuring HD video as well as 4K and 10bit outputs.

Additional support is provided for hardware acceleration, with open standard APIs like OpenCL 1.2, OpenGL 4.2 and DirectX 11 as well as stereoscopic 3D, 4Kx2K resolution and 10bit colour. AMD FirePro graphics cards also support Framelock and Genlock for reliable 3D rendering synchronisation. The PCI Express 3.0 compliant architecture is also optimised and certified for many major ISV applications for the fastest data transfer.

Replacing the V9800, the new AMD FirePro W9000, is heralded as an uber-powerful workstation graphics card. It features 6GB of GDDR5 memory operating at 264GB/s, delivering 4.0 TFLOPS single precision and 1.0 TFLOPS double precision floating point performance.

For digital signage applications and particularly display walls, the AMD FirePro W600 is a highly cost-efficient solution. This half height, single slot professional graphics card is also capable of driving up to six displays or projectors. AMD says it's the most powerful solution available for configuring display walls featuring multiple displays.

www.fireprographics.com or www.amd.com/displaywalls



Dr Arie Kaufman is Project Director at Stony Brook University's Department of Computer Science Reality Deck.