

## *Mobile Displays*

### **LGD Shows Off Latest Mobile Display Breakthroughs at SID**

Korean display maker LG Display is making a big push for mobile displays, as the company was on hand at SID showing off its latest displays sure to make it into next-generation smartphones and other mobile devices. Breakthrough technologies shown by LG include a new five-inch full-HD panel that boasts a whopping 440 pixels per inch, a glasses-free AS-3D prototype, the “world’s thinnest” (at 0.1mm) mobile panel, plus a new Oxide backplane display. Here are the details.

<b>LG Mobile Displays Shown at SID</b>					
	AS-3D Display w/Eye Tracking	FPR 3D (Tablet)	Super-Thin LCD	Super-Hi Resolution Full-HD AH-IPS	Oxide TFT AH-IPS Display
Size (Inch Diagonal):	4.5-Inch	8.9-Inch	4.5-Inch	5-Inch	4.3-Inch
Resolution (ppi):	720 x 1280 – 2D 720 x 640 – 3D	1280 x 768	720 x 1280 (329ppi)	1920 x 1080 (440ppi)	720 x 1280 (342ppi)
Thickness:			0.99mm		
Luminance:	500cd/m2 – 2D 220cd/m2 – 3D	450cd/m2 – 2D 220cd/m2 – 3D	400cd/m2	500cd/m2	TBA
Color Gamut:	70%	TBA	70%	72%	TBA

*LG Display’s Mobile LCD Modules: Glasses-based; glasses-free, Thin and Narrow Bezel, Groundbreaking Thin and Super High-Resolution*

#### **Full-HD 1920 x 1080 Prototype (440ppi)**

LG Display showed off a five-inch super high-resolution (440ppi) full-HD 1920 x 1080 in 16:9 format using its aSi (amorphous silicon) backplane with Advanced High Performance In-Plane Switching (AH-IPS). The company billed it as the world’s first mobile FHD panel.

Keep in mind that AH-IPS was also shown at last year’s SID in sizes ranging from 3.5-to-9.7-inch in the mobile space. But the new high-resolution prototype beats out the previous high-pixel-dense panel (a 4.5-inch 329ppi 1280 x 720) with the new claim of 0.5 inches larger, 2.2 X



*LG’s FHD Mobile Display at SID 2012*

more pixels, and 1.3 X more advanced in ppi than its processor. The company said the new high-resolution panels will be available in 2H’12.

Another continuing theme in the mobile space is the slim design and LG is claiming “the world’s thinnest” title with a 0.99mm-thin panel. To get there, LG said it reduced its glass thickness from a conventional 0.20mm to 0.15mm and BLU thickness

down from 0.825mm to 0.44mm. These LCDs were not just pushing state-of-the-art in thinness, they were showing some of the best mobile display images at the show.

### ***Glasses-Free 3D Display With Eye Tracking***

Perhaps the most notable small display in the LG Display booth was its new 4.5-inch AS-3D display that uses eye tracking to deliver a “Viewing Angle-Free 3D” image. LG’s display prototype was shown with a camera mounted for eye tracking using face detection that LG’s Dongkyu Kim said has less than 0.5% cross talk at its center with a viewing angle of 48 degrees in both h and v directions. This is at a viewing distance of 30 to 35cm, about the distance you would hold a handheld mobile device.

Kim told us that this display is simply a proof-of-concept prototype, and the group plans to develop a 7-to-10-inch commercial display to target AS-3D for the tablet market. To show off the display’s 3D capabilities, LG developed a 3D game for folks to play.



***LG's AS-3D Prototype at SID***

### ***FPR 3D WXGA Tablet Display***

LG Display wants to see 3D tablets take off, so the company was also showing an 8.9-inch tablet-size 3D panel with 1280 x 768 using Film Patterned Retarder (FPR) 3D technology that requires polarized glasses. Specs include 0.5% 3D cross talk (at center), a (+-) 7-degree vertical viewing angle. We’ll have to wait and see if LG gets an OEM for this component or if it decides to come to market with its own 3D tablet. Plus, it is unclear if consumers will don glasses to watch 3D on a mobile device.

### ***Oxide TFT Mobile Display***

LG also showed off a 4.3-inch oxide TFT mobile display panel in 720 x 1280-pixel resolution with 342ppi pixel density. The sub-pixel dot pitch for the display boasting a new oxide backplane is 24.75 microns (H) and 743.25 microns (V). The panel claims a high transmittance of 3.6% and narrow 1.4mm bezel. Power consumption for the display is at (a low) 77mW.  
–Steve Sechrist



***New 4.3-inch oxide TFT display***

## **CMI Shows AS-3D that Reverts to 2D in Off-Axis Mode at SID**

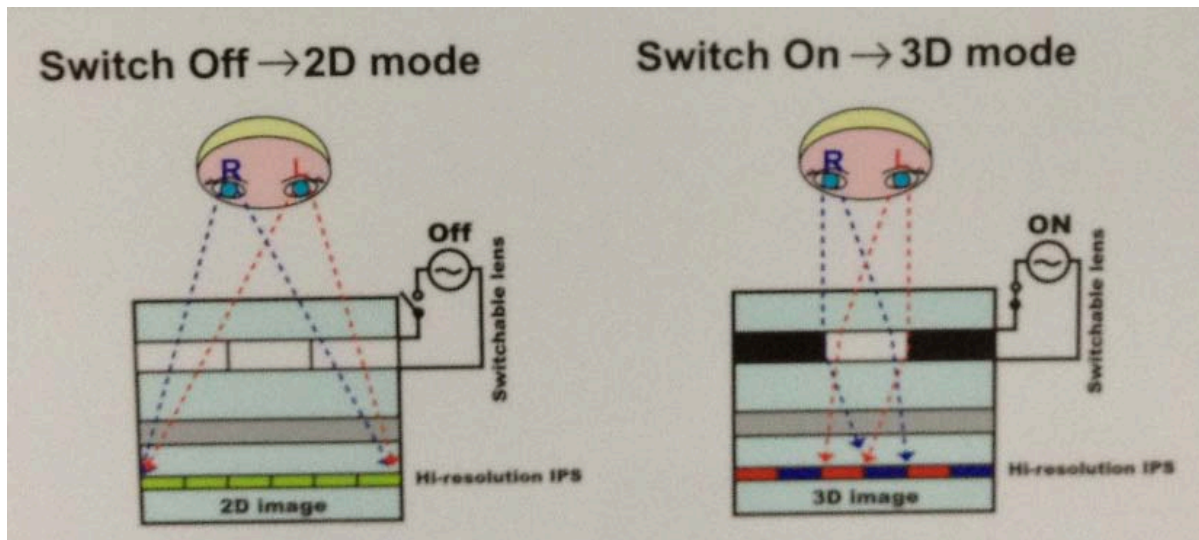
With all the eye-tracking AS-3D solutions being shown of late, Taiwan based [Chimei Innolux](#) (CMI) is taking a different approach with a switchable barrier technology the company showed off in the shape of a 4.3-inch LCD panel during the Display Week exhibition in Boston hosted by SID. The CMI glasses-free prototype display uses a “2D/3D Switchable Barrier” approach to deliver 3D using a switchable layer that, when engaged, creates a 3D image on screen by channeling the light through a “cell gap” (or pixel substructure) generated for the left and right eye separately. Remarkably, when viewed off axis to the 3D image, (still in the “on” state) a standard 2D image appears normal on the screen. When switched off, both left and right eyes see the same 2D image from a larger pixel field delivering a high-resolution image (see attached picture that shows how the cell gap works.)



*AS-3D Prototype shows 3D when on-axis and 2- when not... photo: Sechrist*

CMI said beyond a 2D/3D switchable display, this approach offers a wide 3D viewing angle, low 3D cross talk and low 3D moiré. The group said the panel’s optimized viewing distance is between 30cm and 40cm.

Other specifications of the mobile display panel include a 720 x 1280 pixel resolution with 342 ppi pixel density. Viewing angle of 80-degrees H and V with contrast of >10-degrees off-axis viewing and 25ms response time.



*Diagram of CMI’s 2D / 3D Switchable Barrier Technology shown at SID*

The reported luminance in 2D mode is 450 nits, and 320 nits while operating in 3D mode. One would think that luminance number would be smaller given the drawing provided on the technology that seems to obscure two-thirds of the light in 3D mode. Other specs for the display

panel prototype include a contrast ratio of 1000:1 and NTSC color gamut of 72%. The AS-3D technology was first reported back in October 2011.

We think CMI’s approach to 3D is a good one, allowing for on-axis viewing and the occasional off-axis, that reverts back to a 2D image, plus a high-res 2D when the 3D is switched off. The prototype shows the company can deliver an AS-3D image without eye tracking and that will make it a candidate for mobile 3D displays when it launches commercially. – *Steve Sechrist*

### MIT Media Lab Paints Display Future

MIT Media Lab Director Ramesh Raskar was a keynote speaker for the opening of SID 2012. His inspiring presentation focused on how display technology will evolve beyond the trajectory it has been on to embrace novel new approaches that is all about “Shift Glass.” As Raskar would explain, shift glass is all about shifting space, angle, time and illumination.

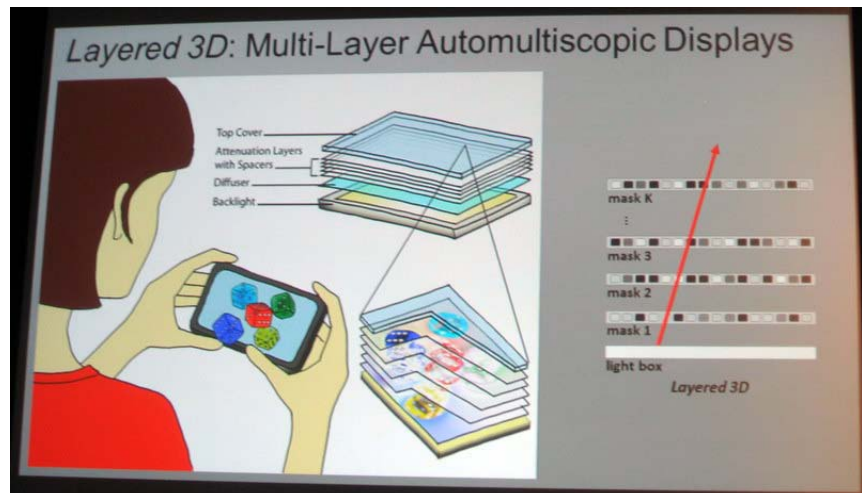
One of the key motivations for the research at the MIT Media Lab is development of next-generation glasses-free 3D displays — an area of robust research not only at the Media Labs, but throughout the display industry as represented by the wide number of papers presented in this area during the SID symposium.

To put the needs for next-generation glasses-free display systems in perspective, Raskar did some simple math. To simply display a 1 megapixel image (~1280 x 720) at 60 frames per second with a 100x 100 view matrix (horizontal and vertical parallax) will require a data rate of about 600Gbytes/sec — well beyond current silicon capabilities. But by moving to lossy optical compression methods, the electrical bandwidth can be reduced to a much more manageable 2Gbytes/sec.

Raskar’s and others’ approach to solving these challenging problems is what they call Augmented Light Field, which uses a combination of interference and diffractive element. This creates solutions that are in-between wave optics-based solutions and ray optics-based solutions.

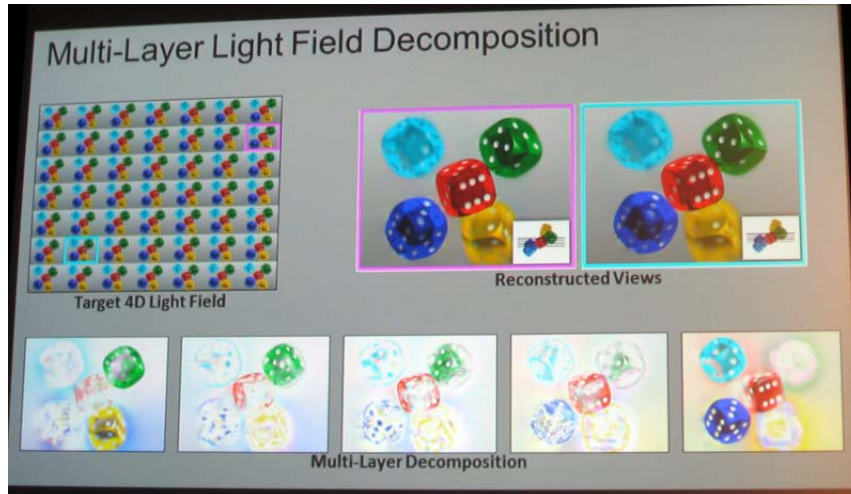
In order to evaluate the potential quality of potential solutions, Raskar and his coworkers at the Media Lab came up with a term called Rank. The higher the rank, the better the fidelity of the 3D glasses-free image.

For example, a static parallax barrier in front of an LCD panel has a rank of 1. It consists of a front mask (the parallax barrier) that has a series of slits and a rear mask (LCD panel) with a series of interlaced views. A high rank 3D display uses an LCD panel for the parallax barrier with variable opacity and can include time



multiplexing to increase the fidelity of the image. A layered 3D and polarization field design uses multiple layers but without temporal multiplexing.

To create content for such displays, Raskar described a process he called tomographic light



field synthesis, which borrows techniques used in medical imaging to create layers of image data. What is different about these layers is that they are not planar image slices. Instead, each image layer has elements from other layers with the impact of the more distant layers diminishing with distance.

Raskar then shifted gears to deliver one of the

more impactful conclusions of his talk: “Speed Beats Resolution.” He then gave a preview of a paper the group will present at SIGGRAPH 2012 in August describing a Tensor Display. This display features a directional backlight and a multi-layer display system that allows the delivery of different images at different angles to the display.

Time multiplexing at speeds of 10X current LCD response times is needed, Raskar said. OLEDs can deliver on this promise today, and blue-phase LCD may in the future. In addition, nonuniform pixel patterns would be nice too to avoid moiré effects.

Raskar concluded by noting that the MIT Media lab is quite involved in all these activities, and it welcomes collaboration with commercial and academia partners to help develop these technologies. –Chris Chinnock

*MIT Media Lab, Ramesh Raskar, 617-253-0329, raskar@media*

## “Picasso 3D Film” Can Add Autostereoscopic Capability to Mobile Devices

At the recent Wireless Japan 2012 conference, [Japan System Project Co., LTD.](#) (Tokyo, Japan) displayed the company’s new “Picasso 3D Film.” Application of the film to the front surface of the LCD in a mobile device enables autostereoscopic display capability.

The film is based on parallax barrier technology.

An application called PicassoMovie will convert side-by-side 3D movies to the Picasso Format, which we presume is an interleaved two-view image designed for the barrier array (it is unclear if this is a vertical or diagonally aligned barrier). This, in turn, will enable mobile devices to display autostereoscopic 3D from Blu-ray and DVD sources, as well as user-generated movies and pictures.

Regarding this last capability, Japan System Project offers a free app that will allow the camera in an iPhone and an iPod Touch to take and create 3D pictures. The application can be downloaded [here](#). The Picasso 3D application for iPhone4/4S can also be download from the Apps page of the Apple store. The app is compatible with iOS 4.0 or later.

Features of this software include:

- Input file: left/right independent, side-by-side
- Over 1,000 images WEB Gallery access
- Display method: side-by-side, mirror, 2D, anaglyph
- Save displayed image
- Slide Show
- Take left/right pictures with the internal camera.
- Adjust left/right image positions and rotation error

There are also apps for converting conventional 2D images and video to 3D.



The Picasso 3D Film is available for the iPhone 4/4S and iPod touch for \$50.58.

The Japan System Project product seems similar to that offered by [SeeFront GmbH](#) (Hamburg, Germany), but without the eye-tracking capability that is part of the SeeFront product offering. SeeFront technology has been discussed several times in Insight Media newsletters, most recently in the April 2011 edition of the *Large Display Report* on pages 21 and 22.

Picasso films appropriate for the Galaxy S2 Android phone, PS Vita, Mac Book Air, iMac, and Panasonic Let's Note laptop are currently in development. –Arthur Berman

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Japan System Project Co., LTD., 0120-769-799, [info@pcpos.co.jp](mailto:info@pcpos.co.jp)

## *User Interface*

### **Leap 3D Offers Sub-Millimeter Motion Control Accuracy at Under \$70**

A new 3D motion control system from [Leap Motion](#) (San Francisco, CA) may just be pointing the way to next-generation intuitive human/computer interface. According to the company, the system features a software and hardware solution that claims discrete sensitivity of 0.01mm or about 200 X higher accuracy than the popular Microsoft Kinect gesture recognition system.

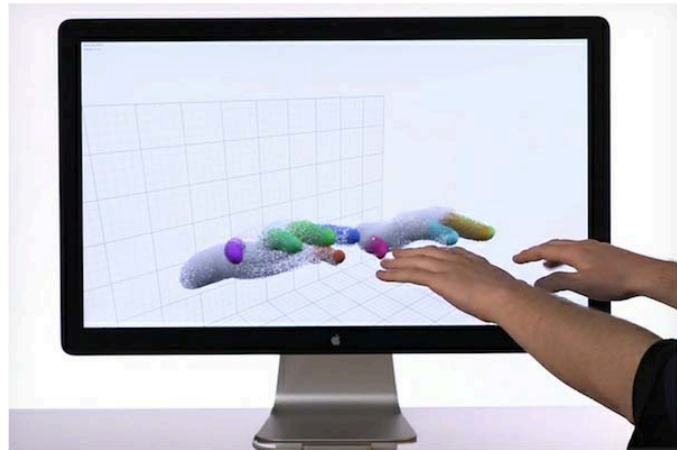
The camera-based system uses a small USB interface built with completely commercial off-the-shelf components with hardware about the size of an iPod. What's unique is a completely different (patented) "mathematical" approach based on algorithms developed by company CTO David Holtz, a UNC Chapel Hill math wiz with a penchant for fluid dynamics. Holtz is credited with groundbreaking technology that led to "leaps" in accuracy of the gesture system.

The Leap Motion technology creates a four-cubic-foot sensory area (usually in front of a display) the company calls its "3D interaction workspace." Here, hand and individual finger motion, facial recognition, and even objects held in the hand can be recognized, tracked and translated into meaningful instructions for the computer system to carry out. See the [Leap Motion online corporate video](#) that is truly astounding.

In bringing the technology to market, the company also learned from Microsoft a thing or two about what not to do. Rather than following the path of the Kinect, where Microsoft made its technology a "closed" system and charged for access to a limited (non-commercial) version of the Kinect SDK, Leap Motion CEO Michael Buckwald said, "We believe that, ultimately, the sheer number of use cases for this technology are so great that the value can only be realized by making it open. Think what would have happened if the mouse had been initially released as a closed technology. The impact would have been a tiny, tiny percentage of what the impact was because it was an open system that anyone could develop for," Buckwald commented.

Microsoft learned its lesson the hard way, and a "Kinect hacker community" developed despite Microsoft's best efforts to contain third-party development for the wildly popular gesture device that still holds the title of world's fastest adopted consumer device.

So Leap Motion will offer software developers kits and "free" sensors (to qualified developers in the U.S.) being delivered as part of an app development effort before the product comes to market. But truth be told, that doesn't leave developers much time, as the Leap Motion



*Leap Motion hardware and SDK claim greater discrete sensitivity than Microsoft's Kinect.  
(Photo source: [theverge.com](#))*

technology is scheduled for release in early 2013 at the remarkable price of just under \$70. The company promises compatibility with both PC and Mac OSX.

The company said it will initially deliver to “a few hundred developers,” but the group expects to expand and distribute between 15K and 20K free kits to help kick-start the platform that should develop a good following based on its increased accuracy that, unlike Kinect, has the ability to track discrete finger movements. According to Buckwald, “We’re going to ask developers what kinds of things they envision building, and from that we’re going to make decisions about the order on which we bring developers into the program,” he said.

First implementations include O/S navigation and Web browsing, plus some game functionality, precision drawing and 3D modeling, all using the hand motions in no-touch required 3D space (think *Minority Report*, or more recently, *Ironman 2*). Top applications identified by Leap Motion include:

- Navigating an operating system or browsing Web pages with the flick of a finger
- Finger-pinching to zoom in on maps
- Letting engineers interact with a 3D model of clay
- Precision drawing in either two or three dimensions
- Manipulating complex 3D data visualizations
- Playing games, including those that require very “fast-twitch” control
- Signing digital documents by writing in air

Some analysts are calling Leap the next step from early mainstream market beginnings that included the Nintendo Wii and Microsoft Kinect. We see this as the next logical step in human machine interface, and when combined with voice, it makes for a compelling replacement of even the tried and true ... hardware keyboards. Top product design companies would be well-advised to look at this technology as the next thing to integrate. –*Steve Sechrist*

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## A Giant Leap Forward in 3D Hands-Free Motion Control

[Leap Motion](#) (San Francisco, CA) has emerged from stealth operations and unveiled the company’s Leap 3D motion control system. The new product gives users the ability to use touch-free gestures to interact with their computer and to do so with an accuracy claimed to be a hundredth of a millimeter.

The technology that enables such precise control is based on an optical system that illuminates an interaction space of about 8 cubic feet using infrared LEDs and captures the image with three tiny cameras. The system can simultaneously track the equivalent of hundreds of thousands of points and can do so utilizing an amazingly low 1–2% of a typical CPU’s capability.

In an interesting comment, Leap Motion CEO Michael Buckwald explained that technology could, in principle, have been developed years ago except for the fact that no one had been able to develop the necessary mathematics.





Leap is a USB peripheral. It is installed simply by being plugged into a USB port, loading the software and doing a quick calibration.



Leap claims that its system can sense motion down to the slightest movement of the thumb or fingers. The system can also identify handheld items, such as a pencil. In fact, the company claims that the Leap system is 200X more sensitive than any other existing, touch-free product or technology. So precise, in fact, that a user can even create a digital signature with their fingertip or a pen.

Leap is compatible with any device that has onboard touch drivers — such as those used for trackpads or touchscreens. This means that Leap’s hands-free motion control technology is backwards compatible with existing apps.

A video illustrating the Leap Motion device in operation can be found [here](#). It can be noted from the video that the system has no apparent latency.

In a recent report by CNET, the Leap system demonstrated the following capabilities:

- Navigating an operating system or browsing Web pages with the flick of a finger.
- Use of a finger-pinch to zoom in on a map.
- Interaction with a 3D clay model.
- Precision drawing in either two or three dimensions.
- Manipulating complex 3D data visualizations.
- Playing games, including those that require very “fast-twitch” control.

The company has created software to encourage third parties to add gesture recognition to their applications. In adopting this approach, Leap Motion has decided not to try to build and popularize apps by itself. In fact, Leap Motion ultimately envisions an app store where Leap customers can source applications.

The current Leap product is a peripheral that will retail for \$69.99, about half that of a Kinect. At this time, a limited number of development kits are available for pre-order. These kits will ship during the next 1 to 3 months. Leap Motion plans to begin selling devices within a year.

The eventual goal is to embed Leap directly into products. This goal is enabled, in part, by the fact that the hardware is physically small and can easily fit into laptops, cell phones, tablets and the like. In fact, the system has the potential to operate even more effectively when embedded. This is because embedding can offer greater flexibility in the placement of the hardware relative to the user’s hands. In addition, multiple sensors can be included to create a larger virtual workspace.

At this time, the company is reportedly in talks with several major hardware manufacturers regarding the use of Leap in laptops.

The capability of the Leap system seems to fall somewhere between an evolutionary and a revolutionary development. If it lives up to its “press,” then the technology seems on-track for near-term commercialization. —*Art Berman*

*Leap Motion, Michael Buckwald, David Holz, [info@leapmotion.com](mailto:info@leapmotion.com)*

## Market Intelligence

### 3DTV Market Update

#### GfK — 3DTVs Will Outsell Smart TVs in EMEA

Market research firm GfK used the IFA Global Press Conference 2012 event to make some predictions about the health of the 3DTV EMEA market. Despite the common perception that 3D sales are weak, GfK says just the opposite is true. It expects the adoption rate for 2012 to be around 122% — about two and a half times the adoption rate of Smart TV, which is expected to grow by 56% this year.



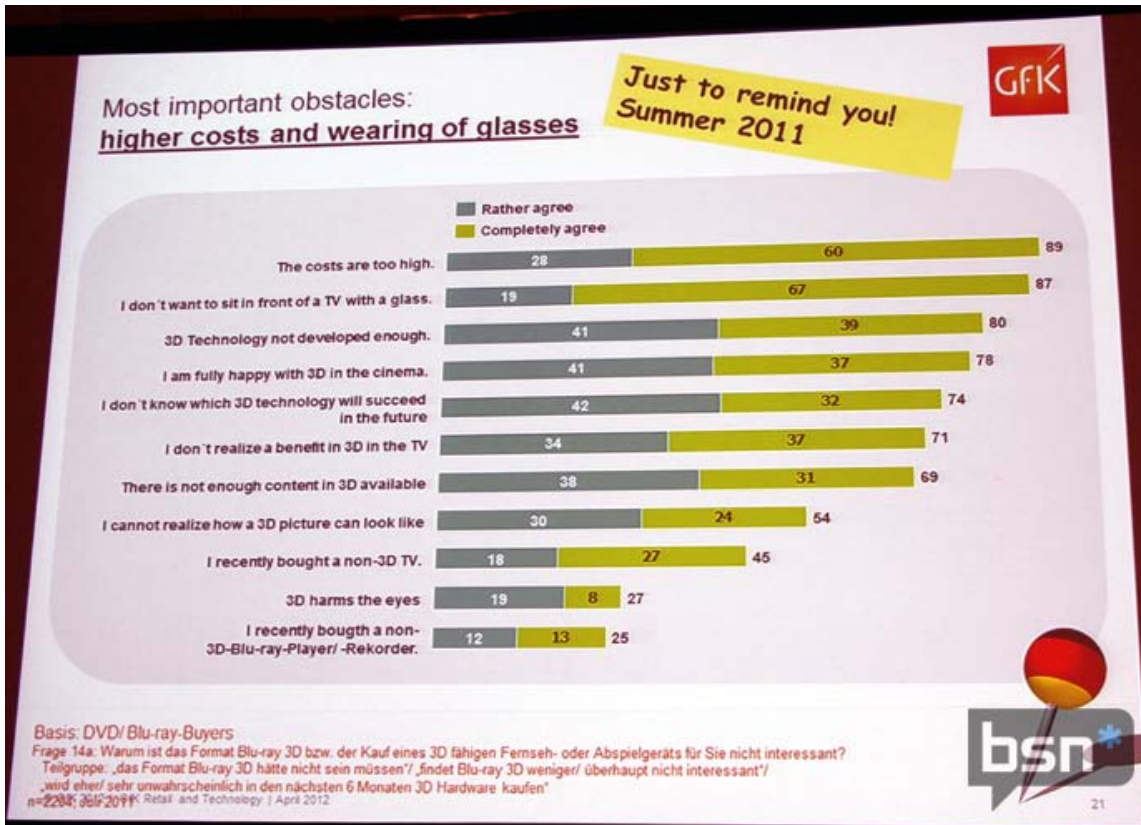
#### *Jurgen Boyny, global director for GfK Retail and Technology*

The surge in 3DTVs comes on the heels of a strong second half of 2011. Are consumers figuring they can get over-the-top content from many devices they already own, but only a new 3DTV will provide the 3D experience, so they are focused on that aspect?

3DTV sales were strong all across Europe. At the end of 2011, Germany ended 2011 with 16.1% of TVs being sold offering 3D capability. In January 2012, that percentage grew to 29%. The most aggressive country is Switzerland, which ended 2011 with 24.1% of sales being 3D-enabled TVs, growing to 42.3% in January 2012.

Representatives of GfK pointed to a surprising turnaround in 3DTV sales from the opinions of consumers expressed last summer (see survey info).

This change in sentiment is echoed in Asia, but not here in the U.S. where TV and 3DTV



sales remain weak.

According to GfK, one of key drivers for the adoption of 3DTV are children. Most animated films are aimed at children, of course — and this has been the most common type of 3D content so far — so it is not surprising that 3D has become a favorite of this crowd. And children’s desires heavily influence parent spending. Very interesting.

**DigiTimes Sees 3DTV Growth, But Emphasis on Smart TVs**

The report from GfK partly contradicts what top brands are thinking, said a report in *DigiTimes*, however. For example, both agree that the global market for 3DTVs is expected to continue to expand in 2012, but *DigiTimes* sees growth momentum slowing in the year, as most top-tier brand vendors are shifting more focus to Smart TVs.

They cite industry sources as noting that the penetration rate of 3DTVs in the global TV market reached 10% in 2011 and will further climb to 20% in 2012, with demand in Western Europe and China serving as a growth driver.

The 3DTV penetration rate in China is expected to accelerate to 25% in 2012 from 15% in 2011, due to marketing efforts being implemented by local brands, as well as Samsung Electronics and LG Electronics.

Local brands in China has been actively promoting 3DTVs, and they even launched CCFL-based 3D models to vie for market share.

LG has recently launched polarized 3DTV models with less-expensive 3D accessories in China, while Samsung has also released shutter-type 60Hz 3DTVs to counter against efforts rendered by local brands and LG.

### ***NPD DisplaySearch Sees Big Gains in 3DTV Sales***

Sales of 3DTVs are on the rise in the U.S. as first quarter volumes grew nearly 74% in units and 64% in revenue over last year, according to results from NPD Group’s Retail Tracking Service. This came despite an 8% drop in overall TV sales in the quarter.

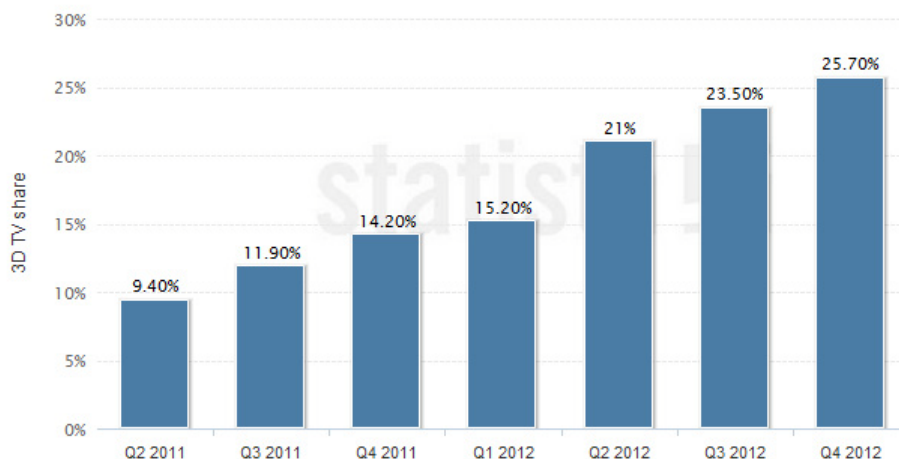
3DTVs accounted for 11% of all flat-panel TV sales in Q1 (about 7M sets), nearly double that of last year, and 22% of all 40+ inch sets sold were 3D.

DisplaySearch also noted that 3D-capable TV sales will increase by 90% in 2012 to 46M units, especially for regions outside of North America. By 2014, North America will regain its lead as the biggest 3DTV market, says the firm.

Ownership of a 3DTV doesn’t necessarily mean consumers have adopted the technology. According to the firm’s surveys, among consumers NOT interested in 3DTV, 14% say content availability is a purchase inhibitor, down from 21% in May 2011. However, nearly 60% of sports fans are interested in watching games and matches in 3D.

<b>3DTV Shipment Penetration by Region, 2012</b>	
W. Europe	25%
China	25%
E. Europe	20%
N. America	19%
<i>Source: NPD DisplaySearch, compiled by Insight Media</i>	

### **3D TV share of global LCD TV panel shipments from the 2nd quarter of 2011 to the 4th quarter of 2012\***



1 Worldwide; Includes 3D Pattern Retarder panels and 3D Shutter Glass panels

Source: NPD DisplaySearch

As an experiential technology, displays and demos at retail are an important component to raising awareness and adoption of 3D. In person, many consumers who try 3D rate it positively, with 70% saying they were “impressed” or “amazed” by an in-store 3D demo.

Samsung Electronics and LG Electronics held a



combined 41% share of the global 3DTV market. Samsung accounted for 25%, down 9% from last year, while LG had a 16% market share, up 8%.

### ***IHS iSuppli Notes Price Increase for 3DTVs***

The most recent U.S. Price and Specifications TV Tracker report from IHS iSuppli (El Segundo, CA) has found that sales of TVs offering features like Internet connectivity and LED backlight actually drove up the overall ASP of TV in Q1'12 by 11.4% (see related story).

That trend also carried through for 3DTVs sold in the U.S. in April. The firm reports that LCD 3DTVs average prices rose 3% over March prices to reach \$2,492. Prices also rose 3% to \$1,638 on average for TV sets featuring plasma technology, which continues to focus on 3D and larger-than-50-inch sizes.

### ***CEA Survey Shows High Purchase Intentions***

Consumer Electronics Association (CEA) has conducted a survey called “The Evolving Video Landscape.” It concludes that consumers are watching more video than they have in the past, across a variety of platforms (see separate story), and finds a high interest in 3DTVs.

It finds, for example, that future television purchases will be based on better picture quality and larger screen sizes as consumers continue to seek the latest innovations in the market. Key findings include:

- 48% of consumers planning to purchase a TV in the next 12 months will be replacing an aging, obsolete or broken set.
- 51% desire improved picture quality in a new display, and half want a larger screen size.
- Of consumers with intentions to purchase a TV over the next year:
  - Nearly 25% expect to purchase a 3DTV.
  - 21% plan to purchase an OLED display.
  - 25% plan to purchase an Internet-enabled TV.

Several aspects of this survey seem strange to us. For example, a 48% TV replacement rate is far higher than a traditional replacement rate — even with a shortening of the replacement cycle we have seen in recent years. This number must be questioned or else it is reflecting a very high level of pent-up demand.

The 21% buying intention for OLED TVs seems very high too. We suspect consumers hear the hype about the product, but when they realize it will cost them \$9K, less than .1% will buy them (DisplaySearch predicts worldwide sales of only 500K units in 2012).

The 25% for 3DTV and Internet-enabled TVs seems reasonable, as these two are often packed together in the same set.

CEA did note, however, “While stated purchase intentions do not always translate to transactions, the study clearly shows many consumers have their eyes fixed on newer TV technologies.”



The Evolving Video Landscape Study (April 2012) was conducted between Feb. 22 and Mar. 2. The complete study is available for free to CEA member companies at <http://members.ce.org> and may be purchased by nonmembers.

### ***Parks Associates Finds Consumers Happy With 3DTVs***

Parks Associates recently surveyed over 600 3DTV owners and found 56% were “very satisfied” with their TV’s 3D features. In addition to more 3D movies, 49% of consumers surveyed want more 3DTV program options, and 45% want more 3D games.

“People who have a 3DTV set use it, like it, and want more content for it,” said John Barrett, director, Consumer Analytics, Parks Associates. The latest Parks Associates figures show just 6% of U.S. broadband households have a 3DTV. “Don’t blame the technology. Prices are still too high, and the amount of content is still too low.”

Barrett said expectations for 3D should be revised: “The industry needs to stop comparing 3D to HD. Consumers are never going to watch everything in 3D. They will watch the occasional program in 3D if the content is compelling, but 2D will always be the default.” – *Chris Chinnock*

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## ***3D Content Creation Tools***

### **Depth by PowerPoint: Presente3D Brings the 3D Advantage to Presentations**

I teach some very popular workshops on how to do teaching (or sales presentations) differently, based on how our minds work. Based on brain research, the techniques I employ cleverly draw the attention of the audience (or passersby in exhibit halls), while sustaining their focused attention on the learning at hand. Done well, these techniques can even go so far as to “visually delight” students (or customers).

It’s all part of my personal campaign — my intentional effort — to utterly destroy the old notion of “death by PowerPoint,” which mean the use of tiresome, unimaginative, overly lengthy, and utterly boring PowerPoint presentations. Of course, the notion of “death by PowerPoint” is forever immortalized in such Dilbert cartoons as the “[PowerPoint Coma](#),” the “[PowerPoint Chimp](#)” and “[PowerPoint Poisoning](#).”

In the stereoscopic 3D world, many have tried to provide a way to convert traditional presentations into stereo 3D, hoping to capture the illusive golden goose “wow” factor. Some of the past players in this field include [CyberLightning](#), [Instant Effects](#), [True3DPT](#) and [XPAND](#). But, to my mind, no one has succeeded in providing an *adequate* tool for producing presentations in stereo 3D.

How do I know? I can’t think of a single teacher, professors, medical professional, researcher or sales/marketing pro that does it consistently. Or does it at all. If it were easy enough — or effective enough — then the talented people I know would employ 3D presentation more often. Instead, what we typically see is a PowerPoint presentation in 2D, followed by immersive content demonstrations in 3D. (note: live [Insight Media University](#) 3D courses use

Instant Effects to deliver a PowerPoint presentation that includes embedded 3D demonstrations so you don't have to break out of PowerPoint to see the 3D)



But now, that is all about to change. A new startup is aiming to become nothing less than a game-changer for educators, corporate marketing and communications: [Presente3D](#). What these folks are up to is so promising; I playfully call it *Depth by PowerPoint*, and I assure you it is a good thing and for quite a number of very practical reasons.

First, the new beta version of Presente3D I have been testing enables 3D content creation through a truly easy-to-use and extremely flexible ribbon bar *add-on* to PowerPoint 2010. Its tagline is “*taking 2D PowerPoint into the Third Dimension.*” It enables the educator, e-trainer, or student to turn their presentations into a 3D format, but more importantly, to turn any graphic or chart within a PowerPoint into a 3D object that can be manipulated in space and depth. Any object or text can be individually extruded and the z-depth adjusted, as well.



Unlike the weak aesthetic results of past players, Presente3D, with offices in New Jersey and a talented technical team in the Ukraine, offers the potential for some very creative and immersive presentations. Its easy and flexible process for designing 3D presentations also offers a stiff advantage in content creation when compared with the inflexibility and tediousness of past entries into this field. In terms of ease of use, here's the way I see it: It's easy enough to use that you can basically construct effective stereo 3D PowerPoint presentations *the night before* your presentation. Here are some YouTube examples so you can see for yourself what its product is capable of: [Example 1](#) and [Example 2](#).

In addition, this tool is quite extensible. It runs on most portable devices, including Apple and Android operating systems, the iPad2, and all 3D TVs and projectors. It is also formulating partnerships with multiple hardware vendors within the 3D autostereoscopic industry.

Yet, the significance of this effective new 3D option for K-20 and corporate customers lies with *content creation*. Perhaps 95% of educational 3D content currently available supports science instruction. Math content is well on its way toward a solid presence this year. But this tool opens up the floodgates of immediate amateur content creation for all the other subject areas, such as English, world languages, social studies, and the arts — to name a few content areas. Think about it. There are over 500M PowerPoint users worldwide. Currently, over 50M PowerPoint presentations are made every day. Now, anyone can be able to create 3D content. It is simply *content creation for the rest of us*.

Presente3D actually makes a lot of sense if it is bundled with projectors or other devices to bring added value to an offering. Users can then create their own 3D content right away. Presente3D echoed this notion, suggesting that one of its main goals for this product is to work

with display manufacturers to distribute this product. By the way, they are aiming for a retail price of \$59 and will also be offering a branded fully functional free version of the software.

If you are interested in exploring this tool, and you own PowerPoint 2010, visit Presente3D's [Website](#) to sign up for their 3D PowerPoint Beta program. –Len Scrogan

*Presente3D, Dennis Cafiero, [info@present3d.com](mailto:info@present3d.com)*

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## Viewpoint 3D Presentation Software Released

[Viewpoint 3D Ltd.](#) (London, UK) was established in 2010 with the aim of developing near-reality 3D software for a range of applications, including business presentations, digital signage, and 3D movie creation. In May, it used the ScreenMedia Expo to unveil Viewpoint 3D Presentation Software.

Viewpoint 3D is based on an original 2D version, but now supports all 2D and 3D screens and projectors, including glasses-free 2D+Depth and Declipse formats. These latter multi-view formats were developed by Philips and supported currently by [Dimenco](#) (Eindhoven, The Netherlands). According to Viewpoint 3D, there is no pre- or post-processing needed to convert the presentation to the multi-view Declipse format — just click the button

The company said, “Viewpoint 3D software enables the instant creation of 3D presentations at near-studio quality as easily as using standard presentation software.” It is not a PowerPoint plug-in, but a standalone presentation creation tool that can import PowerPoint presentations. To get real-time performance, it relies on the latest graphics cards.



What appears to be unique about the product is its object-oriented nature. That means that the 3D presentation renders the file in real time, pulling content from various sources as needed. The content can be updated using FTP, database, or RSS feeds, for example. Therefore users can create presentations with 3D text, texture-mapped images, video and even 3D models, that change instantly with by-the-minute news, weather or price updates, or whatever data is fed in.

A media player or PCs running Viewpoint 3D is needed to auto-update content on the fly and even directly drive Dimenco's new 3D glasses-free monitors, offering a complete

solution for live 3D digital signage (see photo).

On the company's Website, they mention a project with the Italian Airport Authority that uses the Viewpoint 3D software to display flight information, which obviously is updated quite frequently. In an e-mail discussion with Managing Director Robin Colclogh, he explained, “The plan is to run mixed flight departure information, with carefully selected advertising. Turin has a





large passenger flow, especially in peak season, and as check-in areas tend to have higher waiting times, it's the ideal place to run eye-catching adverts. With ViewPoint 3D they can seamlessly mix flight information, even in the 3D scene, with 3D advertising. Since the 3D content auto-updates via a central database, it means that the 3D scenes are live and updates in real-time, so the cost of running the system is really low, even less costly than other 2D systems.”

Apparently, 30 check-in desks went operational in March, according to the company.

The company offers the following related products:

1. ViewPoint 3D Designer professional: full-HD 3D, high-quality real-time rendering with special effects, real-time data managed scenes, supports 2D and 3D glasses and glasses-free monitor output in real-time, includes technical support and software updates for 1 year. Price: US\$249.00 + tax.
2. ViewPoint 3D Designer basic: excludes some specialized features, such as live-3D database support, glasses 3D only, limited technical support and updates. Price: US\$182.00 + tax.
3. ViewPoint 3D Web Designer: version aimed at rapidly creating 3D presentations and videos for the Web, including 3D banners. Price: US\$69.00 + tax.
4. ViewPoint 3D Presenter: version aimed at making simple 3D presentations, excludes database and 3D monitor features. Price: US\$49.00 + tax.
5. ViewPoint 3D advanced digital signage player: used to replay content to one or more screens, with full database, datagram, and reporting features. Price: US\$39.00 + tax.
6. ViewPoint 3D basic signage player: used to replay content to one or more screens. Price: US\$27.00 + tax.

–Chris Chinnock

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*Viewpoint 3D, Rob Colclough, +44 208 144 3150, [rcc@viewpoint-3d.com](mailto:rcc@viewpoint-3d.com)*

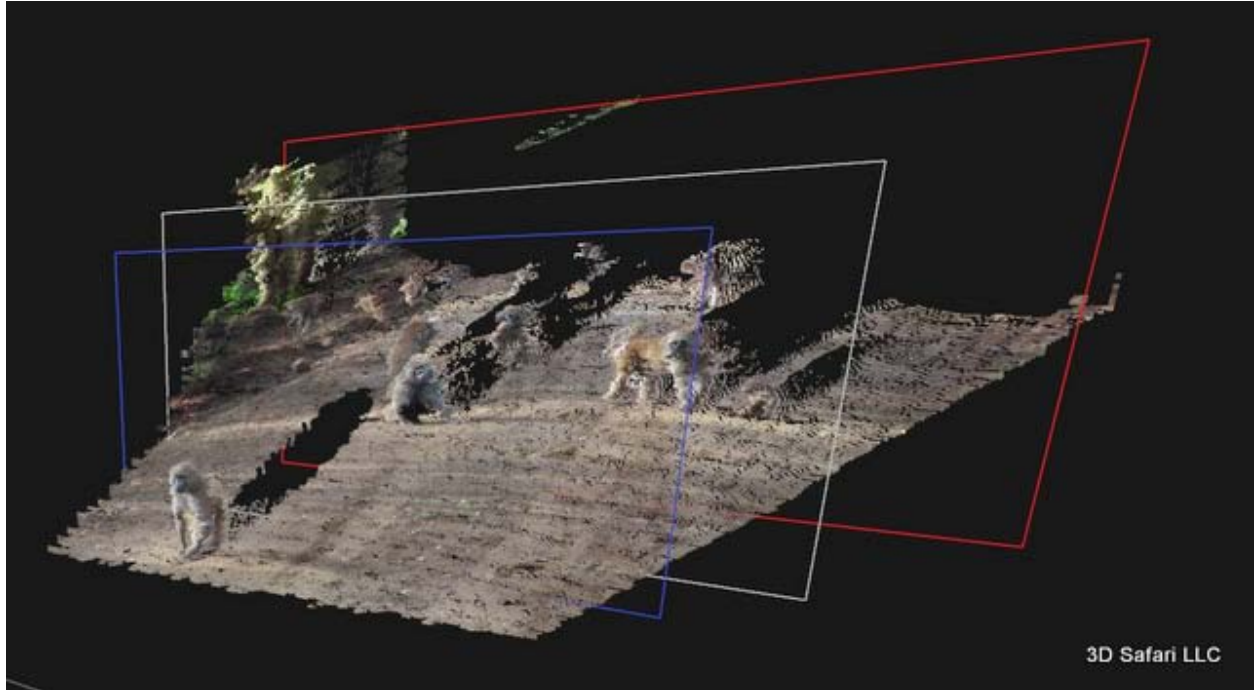
## **emotion3D Unveils Stereoscopic Suite X1 3D Depth Grading Software at NAB**

[emotion3D](#) (Vienna, Austria) was at NAB 12, where Insight Media had a chance to meet with the company and get a demonstration of their 3D depth grading software called Stereoscopic Suite X1. It is a professional tool that allows the ability to set safe 3D depth parameters and make frame-by-frame adjustments too.

One of the tools highlighted at NAB was a single slider that enables stereographers to stretch or squash the 3D space (parallax), while another controls the extent of the pop-in/pop-out effect (convergence). This was represented in a clever histogram chart showing the screen plane and front and back boundaries for good 3D (as set by the stereographer).

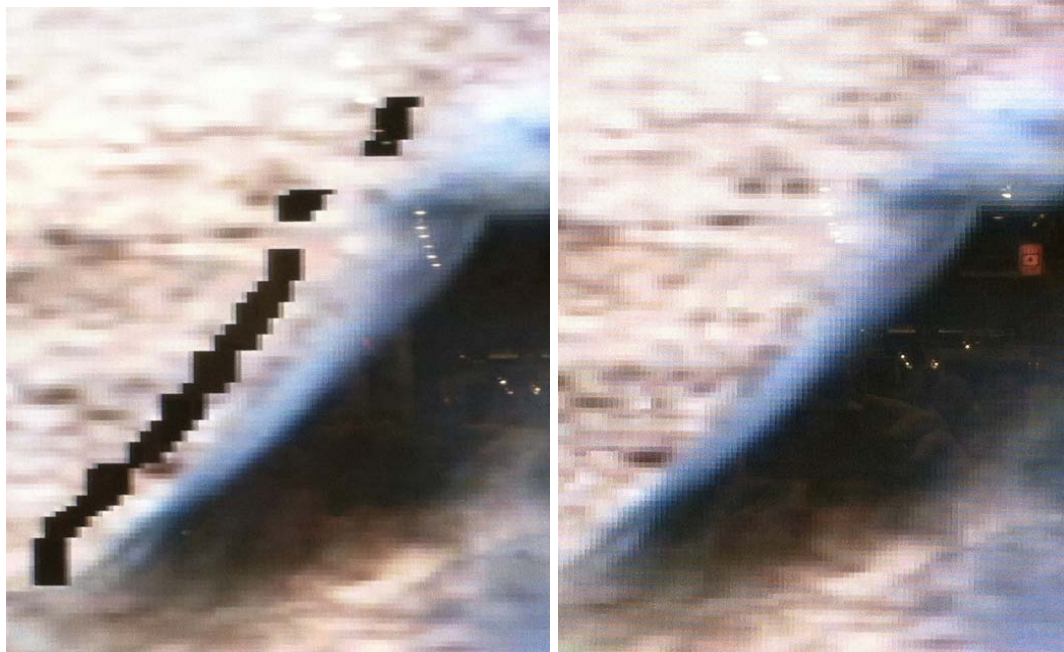
An example is shown in the photo where the parallax is too large (components extend beyond the front and rear safe zone boundaries, and the monkey extends too far into negative parallax space making it hard to fuse. The tool allows the editor to compress the volume to

within the safe zone and then use convergence to position the monkey relative to the screen plane (depending on the emotional effect the director wants).



This histogram can also be rotated to get different perspectives of the scene. And even better, the 3D editor can set the screen size they are editing for (IMAX, TV or handheld, for example), and the good depth boundaries will be automatically adjusted.

There are also tools to help manage 3D scene cuts so there are not big jumps in the disparity and depth position of the main point of interest.



We also saw a demonstration of the creation of a multi-view image from a stereo pair. For the demo, we specifically asked to freeze a frame and zoom in on a feature (the wing of a bird in this case). The generated image showed a series of black pixels behind the wing where there was no data from the new viewpoint. We then watched as the program painted in those missing pixels, doing a very nice job of matching the surrounding background.

The tools are available as plug-ins for Adobe After Effects and openFX-compatible host applications such as Nuke and Sony Vegas. A perpetual single-node SSX1 license sells for €15,000 (\$19,750), with an annual upgrade/maintenance license priced at €3000 (\$3,950). – *Chris Chinnock*

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*Emotion3D, Dr. Tom Wilson, +43(0) 12933263, [twilson@emotion3d.tv](mailto:twilson@emotion3d.tv)*

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## ***3D Content***

### **No Shortage of 3D Films at Cannes 2012**

The recent 65th Cannes Film Festival (May 15-25) featured a plethora of 3D titles, including action flicks, family films, and wildlife documentaries, among other genres. Here's a quick look at some of the 3D films seen at Cannes this year.

- *Escape From Planet Earth*, a 3D animation film featuring the voice talent of Jessica Alba and Brendan Frasier
- Horror parody *Piranha 3DD*
- *Dredd*, a 3D reboot of the sci-fi franchise

- *Walking with Dinosaurs*, a 3D family animation
- *Texas Chainsaw Massacre 3D*
- *Sin City 2: A Dame to Kill For*
- DreamWorks Animation's *Madagascar 3: Europe's Most Wanted*
- Dario Argento's *Dracula 3D*
- Kaleidoscope's *The Penguin King 3D*
- *Dolphin: A 3D Adventure*

Also during Cannes, XPAND 3D continued its four-year role as the festival's exclusive 3D technical partner. XPAND 3D equipped four screening theaters at the Festival, including the 2,400-seat Lumière auditorium, and eight screening rooms for the film market. —*Cheryl Knight*

## ***Broadcast & Distribution***

### **Update on 3D Olympics Coverage**

To cover this summer's Olympics, Olympic Broadcasting Services (OBS) will produce the 3D coverage from three Outside Broadcast (OB) vans (including one from UK firm Telegenic and another from Euromedia) and six separate Electronic News Gathering (ENG) crews.

3D content will then be fed to a 3D operations center in the International Broadcast Centre (IBC) to receive and distribute signals. They will produce a dedicated 3D channel broadcasting 16 hours a day for the Games' duration and a daily highlights program as part of the 3D channel transmission. More than 230 hours of 3D will be produced in total.



Live coverage is currently planned for the opening and closing ceremonies, athletics, gymnastics and synchronized diving, with possible additional live coverage from canoeing and aquatics (swimming, synchronized swimming, diving and water polo).

The intention is that 75–80% of the coverage will come from native 3D cameras and 25–20% from 2D converted cameras. Grass Valley cameras on 3ality-Technica rigs are part of the OB coverage, while the ENG crews, armed with Panasonic AG-3DP1 twin-lens camcorders, will provide feeds for the highlights package for sports, including basketball, beach volleyball, boxing, equestrian, judo, cycling and wrestling. The Panasonic handheld 3D camcorders will come into their own at events where there is neither time nor space to set up and locate an outside broadcast truck.

The 3D feed will be offered by the BBC, CCTV (China), Sky Italia, Australia's Channel Nine, France TV and NBC. Eurosport will also carry about 100 hours and will distribute this content to BSkyB and Virgin Media. NHK plans coverage using an 8K (32 megapixel) acquisition and display solution that will be shown in a few public venues in the UK and Japan.



Here in the U.S., NBC just announced its plans for the Olympics coverage. Overall, they will broadcast 5,535 hours of coverage, including every sport, and will make this coverage available on a variety of platforms, including YouTube. NBC itself will broadcast 272.5 hours and will offer content to other providers such as NBC Sports Network, MSNBC, CNBC, Bavo, NBCOLYMPICS.com and Telemundo.

As for the 3D coverage, NBC will increase the planned hours from 100 to 242, the most ever for an Olympic broadcast. This content will be available in 3D to all U.S. distributors who carry Olympic coverage on cable, satellite and telco — nearly 100% of the multichannel industry. Cable, satellite and telco providers that receive the Olympics package may distribute the 3D broadcast via the Comcast Media Center.

Last year, Panasonic Corporation, a long-time Official Worldwide Olympic Partner in the Audio and Visual Equipment category, announced it would partner with the International Olympic Committee (IOC) and Olympic Broadcasting Services (OBS) to make the London 2012 Olympic Games the first ever 3D Olympic Games.

Norway's Viasat Broadcasting has also agreed to transmit the London 2012 Olympics in the 3D format following a sublicensing agreement with public broadcaster NRK. More than 100 hours of coverage will be broadcast on the Viasat 3D channel, the only Norwegian pay-TV channel showing 3D coverage.

The Viasat 3D channel will broadcast live coverage from the London 2012 Olympic Games eight hours a day, as well as four hours of daily highlights. The content will come from the 3D feed produced by the Olympic Broadcasting Services.

In Australia, the Nine TV network will be airing the 3D telecast on 3D channels in Adelaide, Brisbane, the Gold Coast, Melbourne, Perth and Sydney. Reportedly, Nine has pulled in close to a record \$140M in advertising revenue from the Olympics. —*Chris Chinnock*

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## **Should 3D Be Used by Sports Referees?**

At NAB, we had a chance to visit with the Cameron Pace Group (PCG) in its tent between Central and South halls. One thing that came up in our discussion was the use of 3D for refereeing a game.

The use of a review camera in sports to check a call is not new, and many sports have adopted this approach. We have all seen the referee go “under the hood” to review a play and confirm, or reverse, an on-field call. We presume these referees are reviewing HD images from the variety of cameras arrayed around the field, so they can get the best look at the play.

But, should these referees be looking at 3D images too? PCG told us of one case where it had the NBA commissioners inside the 3D production truck at a basketball game and they were looking at some 3D footage of the game. In one sequence, a referee called a foul, but the commissioners were able to see the 3D replay of this and realized that the referee had made a mistake — the player had only touched the shirt and not the body of the other player, so it should not have been a foul call.

To get some perspective on this we contacted Bryan Burns, VP Strategic Planning of [ESPN](#) (Bristol, CT). Burns has been a thought and action leader for 3D since the beginning, and ESPN is the top provider of 3D sports in the world, so his perspective matters. “It would be premature to use 3D for replay purposes at this time,” said Burns. “Not enough telecasts are produced in 3D to put game officials in the position of video review with a technology with which many of them are not familiar. I personally would also not like to see prospective decisions tagged with, ‘This ruling might not have been made if the game had been shown only in 2D.’ There are also logistical difficulties that could make 3D review difficult in a stadium environment. Maybe in time ... but this, in my opinion, is not yet the time.”



Howard Postley, CTO of [3ality Technica](#) (Burbank, CA), finds the idea of a 3D review a dubious proposition too. In an e-mail exchange with Insight Media, he said, “It is rare that all stereoscopic depth cues are handled equally, much less correctly, so 3D opens the door to creating an illusion of certainty that isn’t there. A 2D camera shooting across the goal line of a football field will convey just as much information about someone crossing the plane as would a 3D camera. If the camera is behind the goal line, a stereoscopic camera would have more information than a monoscopic camera, but it is likely that the cameras will have neither an unoccluded view, nor be calibrated sufficiently to achieve millimeter depth accuracy at a distance of 20m across a wide area.”



He went on to say that the right question to ask is, “Do you want to provide visual evidence of something, or are you actually trying to measure it? I can use LIDAR or SONAR or PLANAR or various types of machine vision solutions that produce things that don’t look great, but are both accurate and resilient. The fundamental issue, however, is that this is show business, not science. You are potentially asking people to believe that something they saw isn’t true because something they can’t see proves it.”

That’s a very good point. What’s your opinion? Write to me. –Chris Chinnock

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