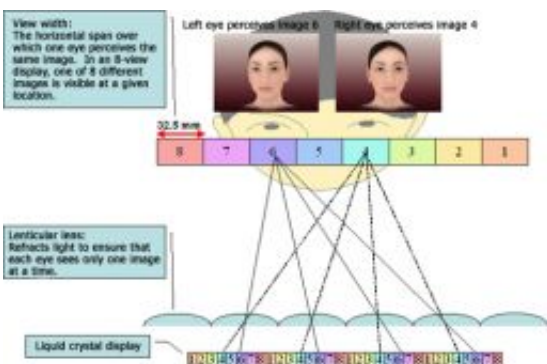


Epson Develops New High-Resolution 3D LCD Display

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The observer's left eye sees image 6, while his right eye sees image 4. The two images are merged in the brain so that the observer perceives a 3D image. When the observer moves his head or changes position relative to the screen, the images that enter the eyes changes, so the observer sees a different 3D image. (For example, the 3D image perceived when the observer is looking at image 7 with his left eye and image 5 with his right eye differs from the 3D image perceived when the observer sees images 6 and 4.)

(PhysOrg.com) -- Seiko Epson Corporation has developed a high-resolution (equivalent to QVGA) autostereoscopic 3D liquid-crystal display that affords extra freedom of viewing position compared to conventional 3D displays, without the need for special glasses.

Demand is on the rise in the movie and gaming industries for 3D images that provide a different level of excitement from that offered by two-dimensional images. Conventional 3D displays are not up to the task due

to their limited viewing zone and low resolution.

Epson's newly developed 3D display addresses these problems with a lenticular lens optimally designed for a view width of 31 to 32.5 mm. (Lenticular lens: A columnar array of cylindrical lenses that determine the view width by refraction). The development prototype presents sharp, vivid 3D images over a wider viewing zone than was previously possible. While 3D displays have often traded off resolution for enhanced 3D effects, Epson has successfully improved the perceived image quality by using "step 3D pixel array" technology.

To further popularize 3D displays and 3D content, Epson will promote the optimized 31-32.5 mm view width as an industry standard. Epson sees 3D displays that render scenes in sharp, vivid color as the next-generation of highly realistic displays and is working on proposals for delivering compelling entertainment to customers.

Technology features

[Optimized view width]

(1) Smooth 3D images

Epson's 3D display is a multiview system. Multiview systems are generally acknowledged to provide superior 3D image reproduction because the image that is visible changes along with the observer's vantage point relative to the screen. To heighten the illusion of depth in stereoscopic 3D images, design engineers can increase the number of views so that the image can be viewed from various head positions. The problem, however, is that increasing the number of views has led to a loss of resolution per view, since only so many pixels can be placed on a liquid crystal display.

Conventional multiview displays commonly employ lenticular lenses designed for a view width of 62 to 65 mm, a distance equal to the separation between the eyes of an average person. Epson, bucking the conventional industry wisdom that held the best view width to be the distance between the eyes, designed its system based on a view width of 31-32.5 mm. With a view width half that of conventional designs, combined with optimizations to prevent loss of resolution and add 3D information, Epson has succeeded in developing a display that offers smooth, high-quality 3D images.

(2) Wide viewing zone

Images on ordinary 3D displays designed with a view width of 62 to 65 mm can appear incorrect and be uncomfortable unless viewed head-on from a certain distance, since the eyes can detect a 2D image in portions of the display. The optimized view width on Epson's display reduces the appearance of visible 2D images and enables natural-looking 3D images to be viewed from a wider viewing zone.

[Step 3D pixel array technology]

To address the problem of resolution loss on multiview displays, Epson uses an image processing technology called "step 3D pixel array" that takes into account the sensitivity of the human eye to resolution loss in the horizontal direction. By minimizing pixel horizontal resolution degradation, Epson has improved perceived image quality to provide viewers with sharper, more vivid 3D images.

Provided by Epson

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