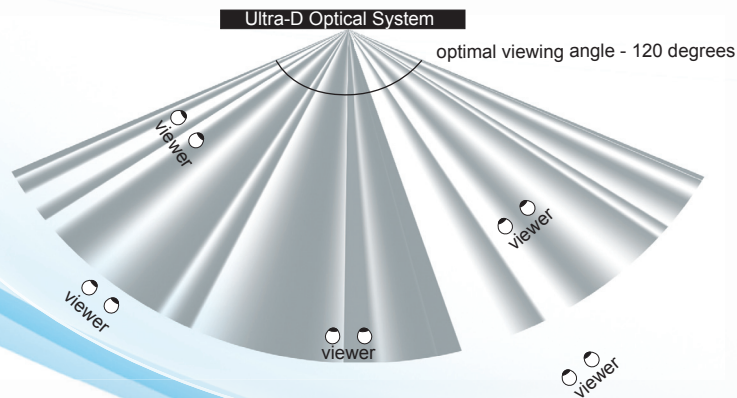




The Ultra-D 3D Displays address human depth perception in a more natural way giving the viewer the sense of being there.

Introduction: The Ultra-D technology for 3D displays has been developed to result in a natural 3D perception, where glasses are no longer needed. The Ultra-D technology generates a lightfield addressing human depth perception in a way close to seeing the real three-dimensional world. The Ultra-D optical solution addresses two important depth cues; stereopsis and (partial) motion parallax, resulting in a more natural 3D experience.

The Basis of the 3D Perception: Human beings have three dimensional perception of the world around them. People perceive some objects to be nearer than other objects by means of depth cues. These cues are classified as binocular (when sense of depth is achieved by cooperation of both eyes and the brain) and monocular cues (when vision from one eye provides stimuli to perceive depth). Stereopsis is commonly referred to as the only means for depth perception. This is inaccurate, as depth perception relies on many more cues than stereopsis.



How does Ultra-D generate stereopsis? It does so by using a stack of layers of refractive and diffractive optical elements, optically transparent, bonded to a liquid-crystal display. The light of individual sub-pixels is projected into space in such manner that it generates something similar to a light-field. Virtual and partial sub-pixels merge in the space and form complete and separate views for each eye of the viewer (then the viewer's brain takes over; processing them in the same natural way, as it is used to in the real world, creating a natural 3D experience. It is very different to 3D display technologies with glasses, which only project two discrete views of a scene. With the Ultra-D technology the viewing areas (light-fields) are repeated in a horizontal way and the transitions between these areas are smooth. So, a viewing area is not divided in discrete viewing zones (cones) as is done in most other technologies, but the optical system creates an almost continuous light-field in front of the screen. (see image)

The technology does not need special equipment as sensors for eye or head tracking. This means there is no limitation to the number of viewers and there is no fixed viewing position with respect to the screen. It allows a viewer to move freely in the range of recommended viewing angle of approximately 120 degrees and feel as if looking at the world through a window.

Monocular cues are also important for perceiving three dimensions. Monocular cues allow people with partial or complete stereo-blindness (when a brain does not perceive the differences between two eyes as depth) to still see three-dimensionally. Motion parallax is a monocular cue, which is independent from stereopsis. Motion parallax is a strong trigger for perceiving depth. It can be experienced when an observer moves, the background moves in respect to the object(s) in the foreground or vice versa.

How does ULTRA-D generate motion parallax? The Ultra-D system does not generate discrete views but generates something similar to a light-field. As the result, it allows the viewer to perceive the scene from different directions within this field. This enables the background of a scene to appear to move with respect to an object in front of it and vice versa. This allows experience of more complete 3D. Also in this respect Ultra-D is very different to 3D display technologies with glasses, which can project only two views of a scene.

Contact: Stream TV Networks is a Philadelphia-based new media company created to enhance consumer entertainment and communication experiences through superior quality devices. Most exciting part of the Company's portfolio is the glasses-free 3D display technology, called Ultra-D. For more information: www.streamtvnetworks.com



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