360-degree Autostereoscopic Display

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A volumetric 3D display has been a motif in many science fiction movies, and is the very image of futuristic technology. We have developed a prototype 360-degree autostereoscopic display. This display allows us to view full-color volumetric objects from all angles, as if the objects really exist. This display uses special LED light sources, and it can show 360 unique images to all directions in one-degree separations. We can sense the depth of the displayed object, because our left and right eyes are seeing different images. No special 3D glasses are needed to see the 3D image.

The cylindrical display measures 13cm in diameter and 27cm in height. Because of its compact size, we can place the display unit wherever we wish.

The 360-degree display has a digital video input port, and can connect to a PC or other devices. When the video data is supplied to the display, the moving volumetric object appears inside the cylinder. The 360-degree motion image is generated by a graphic processor in real time at 30Hz frame rate. We can move and interact with the object inside the display. The display is also equipped with a gesture sensor which can interactively control orientation of the object with hand motions.

A common 3D computer graphics design software can be used to prepare the volumetric 3D image data. A turn-table is used to capture the photographed 360-degree static image. To capture 360-degree motion images, a new multiple-camera system has been developed. With the view interpolation image synthesis from multiple cameras, we generate continuous 360-degree view-point motion images.

The 360-degree display is the first volumetric 3D display device which features high view-point density (360 views) 3D image, 24bit full-color, compact size and interactive live motion with digital video interface, so far as we know. This display has many potential applications, such as amusement, professional visualization, digital signage, museum display, video games, and futuristic 3D telecommunication.

Resolution	96[H]x128[V]
Number of Views	360
Frame Rate	30 [fps]
Display Color	24bit full-color
Dimensions	13cm[diameter]　x　27cm [H]

Specifications