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3D real holographic image movies are projected into a volumetric display using dynamic digital micromirror device (DMD) holograms.

MICHAEL L. HUEBSCHMAN, JEREMY HUNT, HAROLD R. GARNER, Eugene McDermott Center for Human Growth and Development, Center for Translational Research, University of Texas Southwestern Medical Center at Dallas — The Texas Instruments Digital Micromirror Device (DMD) is being used as the recording medium for display of pre-calculated digital holograms. The high intensity throughput of the reflected laser light from DMD holograms enables volumetric display of projected real images as well as virtual images. A single DMD and single laser projector system has been designed to reconstruct projected images in a 6" x 6" x 4.5" volumetric display. The volumetric display is composed of twenty-four, 6"-square, PSCT liquid crystal plates which are each cycled on and off to reduce unnecessary scatter in the volume. The DMD is an XGA format array, 1024x768, with 13.6 micron pitch mirrors. This holographic projection system has been used in the assessment of hologram image resolution, maximum image size, optical focusing of the real image, image look-around, and physiological depth cues. Dynamic movement images are projected by transferring the appropriately sequenced holograms to the DMD at movie frame rates.

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