

Improving head-up display with waveguides and holographic optical elements (Abstract)

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ABSTRACT

Head-up displays offer ease-of-use and safety advantages over traditional head-down displays when implemented in aircraft and vehicles. Unfortunately, in the traditional head-up display projection method, the size of the image is limited by the size of the projection optics. In many vehicular systems, the size requirements for a large field of view head-up display exceed the space available to allocate for these projection optics. Thus, an alternative approach is needed to present a large field of view image to the user. By using holographic optical elements affixed to waveguides, it becomes possible to reduce the size of the projection system, while producing a comparatively large image. Additionally, modulating the diffraction efficiency of some of the holograms in the system presents an expanded viewing eyebox to the viewer. This presentation will discuss our work to demonstrate a magnified far-field image with an in-line two-dimensional eyebox expansion. It will explore recording geometries and configurations and will conclude by discussing challenges for future implementation.

Keywords: Holography, Head-Up Display, Holographic Optical Element, Diffraction, Waveguide, Field of View

NOTICE

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