

Interactive Eye Aberration Correction for Holographic Near-Eye
Display
ホログラフィックニアアイディスプレイにおけるインタラクティブな目
の収差補正

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Distortions of observed images have been a long-standing problem in near-eye displays. Although many correction methods for optical system-dependent aberrations have been proposed, the image distortions caused by eye aberrations have not been studied thoroughly. In addition to the problem, eye aberrations are individual specific. Therefore, a system capable of correcting the aberration irrespective of the individual is necessary. In this study, an aberration-correctable holographic near-eye display (HNED) is proposed that can be used to interactively compensate for image distortions caused by eye aberrations. For the compensation of aberrations, a propagation equation was formulated which includes eye aberrations in the HNED, and a GUI that enables a user to correct eye aberrations on their own was developed. In this system, the image displayed on the HNED is updated based on the correction coefficients specified by the user. Experiments on human subjects were conducted to verify the effectiveness of the proposed method. The results of the experiments indicate that the minimum identifiable size in the HNED can be reduced by the aberration correction using the interface, and especially this aberration correction method is useful for the visibility of low visual-acuity users.

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