Correction for lens distortion in 4f holographic display system

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Recently, many research works have actively being done on three-dimensional display technology due to its high interest throughout the world[1]. The holographic display system, which most use 4f lens system for removing the DC part and contjugate image, usually will appear the image distortion[2]. Because of the 3D image, we should process the input image depth by depth[3].

Figure 1 shows the reconstructed image with different situation. Fig. 1(a) shows the original reconstructed grid image, which is a perfectly square grid, in the display system without distortion. Fig. 1(b) shows the original reconstructed grid image in the 4f display system with distortion. We could find that the original perfectly square grid shows the distortion in the 4f display system, which because of lens distortion property. However Fig. 1(c) shows the reconstructed image of distortion correction. Because it shows the very original image in common display system, the profile of the Fig. 1(c) is just the profile of corrected input image compared to the original image. Figure 1(d) shows the corrected image displayed on the 4f system with distortion, which is a square grid profile even though it is not perfectly square.

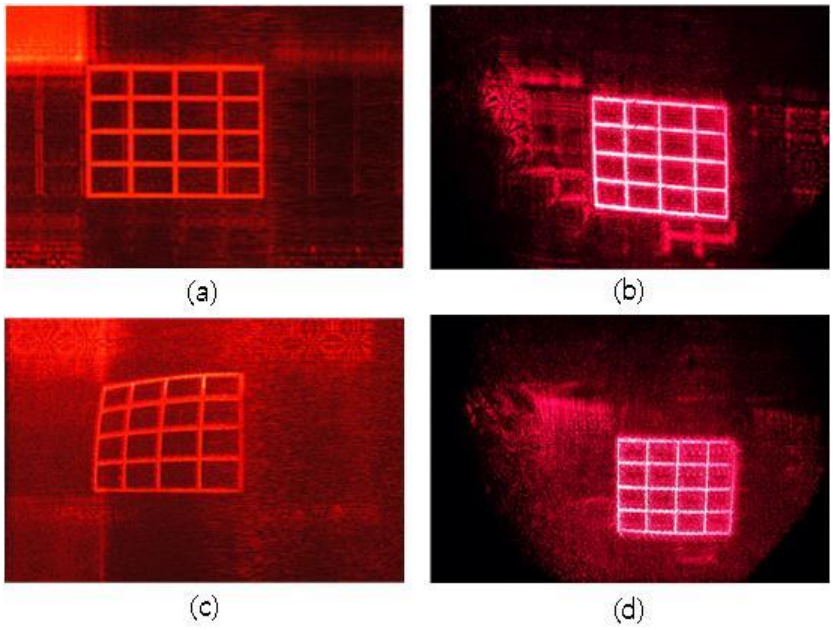

Fig. 1. Reconstruction result of distortion correction. (a) Result of original grid image without distortion. (b) Result of original grid image with distortion. (c) Result of corrected grid image without distortion. (d) Result of corrected grid image with distortion.

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References

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