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Title	3D Image Reconstruction of Sclera Using A Light Field Camera
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Abstract

The development of digital image analysis with various devices used is very useful in various fields. One of them is in the medical field. Analysis of the sclera's surface is critical to determine whether there are lumps or bleb due to disease or after the trabeculectomy procedure. This study proposes a different method for constructing a 3D model of the sclera's surface through light field image processing. First, the sclera's surface light field image device was developed using a Lytro Illum camera equipped with illumination. Second, the depth map generated from the light field information is equalized and filtered to improve the gradation. Thirdly, edge detection information is added to obtain texture. Finally, a 3D image reconstruction is performed. Based on the measurement results, the average resolution of the Lytro Illum camera to reconstruct 3D images of objects taken at a focal distance of 17cm and a focal length of 80mm is 0.14mm. The error of image reconstruction in the proposed method is smaller than the other methods compared.