Light Field Display Modeling

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Today, 3D displays are used in a variety of fields. Different 3D display sizes and pixel structures are increasing as they are used in various fields. As changes in 3D displays increase, it becomes clear that 3D quality predictive models are needed to adapt to the different pixel structures and sizes of 3D displays. The limitation of previous generalized measurement models for 3D display design is that they can only be used for single-pixel structures. Therefore, the goal of this paper is to develop a 3D display design method that can simulate 3D images and measure the quality of 3D images regardless of the display size and pixel structure.

Quantify the quality of 3D images by using 3D light field representations and perform simulations to predict the quality of 3D images regardless of their pixel structure. First, one of the prediction methods is a quality model. A display that shows uniform light and color is defined as the sum of luminance and color uniformity as it makes 3D images look real. Second, another prediction method is simulation. It uses a 3D light field representation to define the ray of the display and estimate which ray the viewer will be affected by. The design model was developed to be implemented with various pixel structures.