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器件物理及器件制备技术

狭缝光栅分光特性及其对视区的影响

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摘要： 应用光栅等分光元件对视差图进行空间分离是实现立体显示的重要方法之一,介绍了狭缝光栅作为分光元件实现立体显示的原理,建立了子像素发光经过多个周期狭缝光栅的数学模型,分析狭缝光栅参数及子像素发光宽度对视区及立体显示器亮度的影响。结果表明,在对狭缝光栅参数设计过程中需要综合考虑视区特性与显示器亮度,狭缝的透光比应控制在0.2~0.3,在样机生产过程中将透光比定为0.25,采用高亮背光模式以补偿立体显示器亮度,取得了较好效果。结果对狭缝光栅的参数设计具有指导意义。

关键词： 自由立体显示 狭缝光栅 透光比 视区

Optical Properties of Parallax Barrier and It's Influence on View Zone

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Abstract: Redistributing parallax images by light directing element such as grating is one of the most important methods to achieve 3D display. This paper gives an introduction of how parallax barrier works to realize 3D display. The mathematical model of beams out of multi-period of barrier has been built to explore the roles played by barrier and width of sub pixel. Software to simulate the optical field in front of the 3D display has been developed. Both property of view zone and brightness of the display should be considered in order to get better 3D result. This study shows that the slit ratio for parallax barrier should between 0.2 and 0.3. In the process of prototype making the scale was set to 0.25. Particular bright backlight module was applied to compensating the lower brightness caused by lower scale and the display got a satisfactory result. The result has directive meaning for design of 3D display based on parallax barrier.

Keywords: autostereoscopic display parallax barrier slit ratio view zone

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