光电工程

多视点自动立体液晶屏的研制

陈瑾[1],麻金继[2],叶为全[3]

1.安徽师范大学物理系,安徽芜湖241000;2.中国科学院安徽光学精密
机械研究所,合肥230031;3.中国科学技术大学,合肥230029

摘要   为了研制出不需要立体眼镜,且兼容平面显示的自动立体显示屏,利用液晶制作出透光狭缝,
放在面板和背光源之间,使之加上电压时只有狭缝透光,背光变成一排平行的线光源,
照射液晶屏时每个光源对应4列子像素,左右眼只能看到不同像素,
进而产生立体感。不加电压时背光变成面光源,
和普通液晶显示屏一样显示平面图像。为了减少面板表面防眩偏振片的影响,
用减反射涂层覆盖防眩偏振片。通过改变普通液晶屏的背光,以及对普通液晶屏表面进行处理,制作出了4
个视点的立体显示屏,实现了立体显示和平面显示的切换。该技术方案可满足批量生产的要求。

关键词   应用光学   自动立体显示器   多视点   视差照明
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Manufacture of multi-view-point auto-stereoscopic LCD panel

CHEN Jin [1],MA Jin-ji [2],YE Wei-quan[3]

1.Department of Physics, Anhui Normal University，Wuhu 24100，China;
2.Anhui Institute of Optics and Fine Mechanics，Hefei 230031，China;
3.University of Science and Technology of China, Hefei 230029，China

Abstract For fabricating the autostereoscopic liquid-crystal display panel, the backlight was changed and the front side of the panel was modified. A liquid-crystal device was inserted between the backlight and the TFT LCD panel. Every pixel in the device is a slit. By the Moire fringe (picket fence effect), the device and LCD panel were aligned. When driven with voltage, the backlight is converted into a large number of thin, bright, vertical illuminating lines, between which there is a dark space. Every light source corresponds to four columns of sub pixels as the liquid-crystal display panel is illuminated. Sitting at the average viewing distance in front of the display, the observer's left eye sees only the information on some columns of sub-pixels, and the right eye sees only what is on the other columns. Without voltages, the backlight functions just like the normal LCD, the module can display the normal two-dimension images. The front side of anti-glare polarizer is coated with an anti-reflective layer to avoid light diffusion. The autostereoscopic TFT liquid-crystal display module is a multi-view system, and can display stereo and plane images. The technology can be adopted in mass production.

Key words   applied optics   auto-stereoscopic display   multiple view point   parallax illumination

通讯作者   陈瑾 chenjin221@sina.com

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