URN etd-0407109-183712-942
Author HongChi Chen
Author's Email Address No Public.
Statistics This thesis had been viewed 43 times. Download 0 times.
Department
Year 2002
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title The Study of the Brightness Uniformity of a Diffuser in Outdoors LCD with Monte Carlo Simulation
Date of Defense 0000-00-00
Page Count 0
Keyword
Mie theory
Monte Carlo method
multiple scattering
transport mean free path

Abstract
Outdoors Liquid-crystal displays (LCDs) are usually applied to commercial billboards. High bright fluorescent lamps are used for backlight sources. However, they result in light distribution nonuniformity after light passing through a diffuser. To achieve the illuminating uniformity, printed dot patterns and shaped variations of structure, together with a rear reflector that is a common practice in backlight systems, could be utilized in a diffuser. Based on multiple scattering effects, HSOT polymer introduced as an advanced optical material for the light-guide plate of backlight system could be applied to a diffuser too. It is important to investigate the behavior of photon transport in a diffuser for better designing a perfect transmitting diffuser. The problem of photon transport in thin disordered slabs could be exploited using Monte Carlo random walk simulation.

To improve the brightness uniformity of outdoors LCD, we have developed a random walk Monte Carlo simulation algorithm to analyze the behavior of photon transport in a diffuser. We present the simulated results. By examining the effects of scatter size, volume fraction and the thickness of a diffuser on brightness uniformity, we find that the thickness of a diffuser is the most prominent effect among all these parameters. The design parameters of an optimal structure for a diffuser are recommended.
Advisory Committee ChihChieh Kang - advisor

Files No Any Full Text File.
Date of Submission 2003-07-07