立體影像即時投影研究

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摘　要

視覺影像設計概念因科技蓬勃發展，進而轉換爲具數位多元化之影像傳達。現今逐漸成熟的數位科技技術更已實現許多可能性，在眾多以視覺傳達訊息之平台方式的表現下，爲提升社會大眾對影像顯示的認知與實務之應用，本研究主要探究投影顯示技術的歷史發展，並從中反思未來立體投影技術在運用與結合上的可能影響性。

如今，立體投影技術透過科技結合設計概念的創新呈現下，可創造出更令人驚艷的視覺傳達效果，並呈現出具超現實的場域空間影像，因其視覺暗示因素之特性與原理，更加模糊了人們對於真實與虛擬的界定，亦分不清何爲虛實真假。

全像影像具有完整紀錄立體影像特性，與表現虛實空間錯置感之藝術特質，透過本研究運用全像成像原理與投影特性，並經由兩組實驗來探討全像立體影像投影之角度設定依據，而後將其角度設定規則延伸運用至創作當中，以及測試不同投影成像媒介，達到降低投影技術之成本限制。本研究透過實驗得到以下結果：

1. 當全像立體投影與其它裝置空間相結合時，必須注意投影出之影像是否爲不變形實像，以達到發揮全像投影之特性，實驗證明其全像拍攝時的夾角角度設置有其規範可循，並且在角度的設定上將會影響拍攝中的參考光入射底片夾角角度，以及拍攝完成後以雷射光筆還原影像投影角度。
2. 針對進行全像立體投影時爲達到降低投影成本之目的，並透過不同反射率 Polyester Film（PET）反射膠膜做爲成像介質，實驗結果顯示反射率 85%反射膠膜爲最佳成像介質，並且當反射率越高所投影出之全像立體影像成像越趨於立體以及清晰。

關鍵詞：立體影像、全像立體投影、Pepper's Ghost。

A Research on the Real-time Projection of Stereo Image

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Abstract

The concept of visual image design grows greatly because of the development of technology, and it is transferred into image communication in a digital way. The digital technology nowadays has achieved many possibilities via the representation of visual information communication. In order to improve people's knowledge about the image display technology and its practical application, this study aims to explore the history of projection display technology, and reveal the possibility of integrating and applying the stereoscopic projection technology in the future.

Nowadays, the stereoscopic projection technology is able to create splendid visual effect and superrealism image through the innovation of combining technology and design. The visual implication feature and principle of the technology make the definition of reality and virtual illusion fuzzy and hard to distinguish.

Holography has the characteristics of recording the complete stereoscopic image, and displaying the art of virtual space. The study applies the projection of hologram, and explores the proper projection angle and the best projection medium via experiments. The creations followed the conclusions of the experiments aims to reduce the cost of the product. Two conclusions are made via the experiments:

1. While combining holographic projection with space installation, it must be noticed that the projected image needs to be real image without deformation. The experiment proves that there is rule of the laser light angle in the process of making hologram. The setup of the angle will affect the angle of reference beam toward the holographic plate, and the reconstructed angle when reconstructing the image by using laser pointer.

2. In order to achieve the goal of reducing the cost of the projection medium, the experiment uses the Polyester Film (PET) with different reflecting rate as the projection interface. The result shows that the one with 85% reflecting rate has the best effect. Moreover, higher reflecting rate has clearer image when projecting the hologram.

Keywords: Stereoscopic Image, Holographic Projection, Pepper's Ghost