# 以數位動態式全像技術應用於台灣特有種鳥類博物館展示

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## 摘要

全像立體影像發展至今，其拍攝技術可透過多種拍攝方式，製作不同效果的全像立體影像，在應用層面，也漸漸地廣泛被應用於生活當中。本研究將數位動態式全像(Digital Dynamic Holography)技術應用於鳥類生態博物館展示，並探討博物館展示媒材應用與鳥類生態教育推廣關聯性。

數位動態式全像具備著 4D 時間動態特性，相較 2D 平面影像，除了彰顯影像立體感與空間深度，更能呈現出魔法般的動態影像效果。因此，本研究將動態式全像影像結合博物館展示輔助說明，對於鳥類生態博物館標本展示，可藉此呈現該物種的動態影像，參觀者可透過影像了解展示物的生態習性，達到展示與視覺多元化，亦增進博物館教育之效益。

本研究先行分析整合博物館展示、鳥類生態教育、全像立體影像的發展現況，透過專家訪談、光柵與全像媒材之影像對照實驗、明度對比影響全像影像立體度關係等三項實驗得到以下結果：

1. 透過訪談了解科技媒材展示與鳥類生態博物館展示應用之可能性。若鳥類生博物館展示結合科技媒材，可達到具備趣味性的學習。
2. 實驗證明全像相較於光柵更能彰顯其影像之立體度、動態效果、浮出效果、視覺吸引度、想收藏的程度，而光柵較能突顯影像清晰度。
3. 加強影像明度對比程度可有助於全像影像成像之立體度，其中增加 30%較爲顯著，但加強至 40%，則會降低全像的成像立體度。

關鍵字：全像立體影像、數位動態、鳥類生態、博物館展示

# The Research of Digital Dynamic Holography Applied on the Museum Display of Endemic Birds in Taiwan

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## Abstract

The development of holography to this day allows creator to produce holograms with different effects via various making procedures, and holography is also widely applied in daily life. The study mainly applies digital dynamic holography on the museum display of avian ecology, and explores the relationship between museum display media and the education promotion of avian ecology.

Digital dynamic holography has the characteristics of 4D dynamic. Compared with 2D graphic images, it reveals not only a stereo image and space depth, but also magical dynamic effect. Therefore, the study combines digital dynamic holography with the museum display to assist in presenting the dynamic images of bird species. Visitors are able to comprehend its ecological habit through the dynamic images, achieving multiple display and visual effect, and promoting museum education at the same time.

The study begins with the analysis of museum display, the education of avian ecology, and the development of holography. There are three experiments made: interview with experts; the image contrast of lenticular and holographic media; the influence of brightness and contrast to holography. Conclusions are shown below:

1. The possibility of technology media display and application of avian ecology museum is discussed in the interview with experts. If the museum display of avian ecology integrates with technology media, interesting leaning will be achieved.
2. The experiment shows that holography is better than lenticulat to reveal the stereo, dynamic, and floating effect. It is also highly attractive and collectible. Lenticular is better to show the image clearness.
3. It helps to improve the stereo effect of holographic image by strengthening the brightness and contrast. The result is obvious with the increase of 30%, but 40% would instead decrease its stereo effect.

Keywords: Holography, Digital Dynamic, Avian Ecology, Museum Display