中文摘要

近年來數位影像浮水印的藏匿技術廣受熱烈探討。儘管浮水印技術的發展至今已趨完整，所處理的浮水印也由字串及黑白的二位元影像進展到灰階浮水印，但在彩色浮水印的技術部份仍有很大的發展空間，而如何盡量保存原始影像的完整性以及建構更強健性(Robust)的浮水印技術爲世所趨。

本研究以能強健性藏匿彩色浮水印爲目的，將以空間域和頻率域的觀念及探討爲出發點，利用離散餘弦轉換或其他頻域轉換將彩色影像由空間域轉換至頻率域，再將彩色浮水印頻域係數經適當處理後藏入媒體彩色影像之中低頻的部分。使其藏入後之彩色浮水印能抵抗各類型影像處理的破壞。本研究利用離散餘弦轉換的方法來推演彩色浮水印的藏匿技術，將頻率域藏匿浮水印的技術由灰階數位影像和浮水印成它 a 拓展至彩色數位影像及彩色浮水印。經由實做結果顯示其確實能夠在維持原始彩色數位影像之品質下藏入彩色數位浮水印，且經過一連串的數位影像處理的破壞(如清晰化、模糊化、壓縮以及切割處理)後，亦能成功的取回所藏入之彩色數位浮水印，提升了數位浮水印技術之應用層面，使其更爲一般化及實用。

英文摘要

The hiding of digital watermarks has been an interesting problem for many researchers in recent years. Although many watermarking techniques were proposed successfully to deal with both bi-level and gray-level watermarks, it is necessary to develop a robust watermarking method for the color watermarks.

The purpose of this thesis is to develop a frequency-domain-based watermarking method in which the color watermarks can be treated. In the proposed method, the discrete cosine transformation is adopted to transform the color images in the time domain into the frequency domain. After the proper treatment, the frequency coefficients of the color watermarks are hidden into the middle-low-frequency coefficients of the color images. In the hiding process, the robustness of the middle-low- frequency is developed into a favorable property to resist the ravages of various image processing. The discrete cosine transformation is used to develop the hiding of color watermarks, successfully promoting the hiding of frequency domain base from gray-level digital images and watermarks to color-level ones. It can be verified by experiments that, after hiding the color digital watermarks, the color digital images can maintain the same qualities. Furthermore, the color digital ones can be successfully taken back after the ravages of various image processing. This result reveals that the application of digital watermarking techniques is promoted to be more general and practical.