

十一、研究計畫中英文摘要：請就本計畫要點作一概述，並依本計畫性質自訂關鍵詞。

(二) 計畫英文摘要。(五百字以內)

The vector quantization (VQ) concept is widely used in many applications. Side-match vector quantization (SMVQ) is a VQ-based image compression method that offers significantly improved performance in compression rate while maintaining the image quality of compressed images. To eliminate distortion propagation, SMVQ requires one extra bit to serve as an indicator identifying which blocks are encoded by SMVQ or VQ, and to make sure all image blocks can be successfully reconstructed. To eliminate the indicators generated by SMVQ, we applied declustering and reversible data hiding concept to design our indicator elimination method. With the indicator elimination method, the computation cost of our method is not significantly higher than that of SMVQ.

Secret information can be protected by using information hiding techniques. In this project, we investigate a novel reversible information hiding scheme by using Sudoku. The scheme embeds two secret digits in the base-9 numeral system into a cover pixel pair by distributing them into two stego pixel pairs at a time. The scheme achieves higher embedding capacity with acceptable lower visual quality of stego images. In addition, the scheme is a reversible information hiding scheme in which the original cover image can be completely recovered after secret data has been extracted. Furthermore, the scheme obtains the security purpose by sharing secret data into two stego images and using different Sudoku's solutions for different secret data transmissions.

Many data hiding techniques have been proposed in the past years. In our project, we will study the techniques proposed in the recent years and investigating some high performance data hiding schemes in terms of capacity and visual quality. In first year, we will apply data hiding technique to improve the performance of SMVQ compression in terms of compression rate. In second year, we will utilize Sudoku to be a reference table and use it to guild the secret data embedding. The scheme not only achieves secret data delivery but also can fully reconstruct the cover image after secret data have been extracted.

Keywords: Declustering, indicator elimination, information hiding, reversible data embedding, side-match vector quantization (SMVQ), Sudoku