

# 中文題目

國立清華大學資訊工程研究所碩士學位論文

題目：影像光譜分割使用突出取向圖形設計的學習完全成對關係

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## 摘要

將一張影像裡有不同特徵的部分分群一直是個影像分割再探討的問題。光譜分割是近年來被廣泛使用的其中一種方法。建立在光譜分割的方法下，我們所要做的事情是建立一個關係矩陣，如何用一個好的方法建立一個好的關係矩陣就是我們此篇論文的目的。我們著重在圖形設計的架構，我們的構圖想法來自於圖形突出部分，圖形突出部分比較符合我們人看圖片的習慣與取向，使用突出部分的想法來構圖，使得背景與背景、有意義的區塊與區塊間的關係更加緊密，如此使得區塊與背景之間的關係權重能被合理分配，我們預想希望被切出的區塊也較容易被切割出來，再經由學習完全成對關係的方法，將稀疏矩陣學習成完全成對矩陣，最後使用光譜分割來得到我們的結果。我們的結果顯示我們改善了因為主體與背景太過相似而造成主體難以被區分出來的問題，此外我們也改善平滑的區塊卻被區分成不同區塊的問題。

關鍵詞: 光譜分割、影像分割、突出

# Abstract

Spectral Segmentation is one of the methods used extensively to separate group with different characteristics for image segmentation in recent years. In image spectral segmentation, we should build up a similarity matrix. In this paper, we propose a method to build up the similarity matrix. We focus on the graph design based on saliency, which fits the habit of human vision. Use the notion of saliency to design a graph so that backgrounds and meaningful regions are more compact. In the graph, the weight of the Affinity Matrix between background and regions can be distributed reasonably. The region which we expect is more likely to segment out and then we learn to get a Full Pairwise Affinities Matrix. Finally, we run spectral segmentation with our Full Pairwise Affinities Matrix by using the graph to get the segmentation result. Our results exhibit the improvements for objects with similar colors to the background so that some segmentation algorithms are usually hard to find out the boundary of objects. Moreover, we improve the problem of unexpected boundary at smooth surfaces, which is caused by spectral segmentation.

Key words: spectral segmentation, image segmentation, saliency