

應用模糊邏輯的攝影構圖辨認方法

中文摘要

本論文應用攝影構圖法則，以模糊邏輯理論為基礎，判別影像的攝影構圖類型。構圖(Composition)乃是攝影這項平面藝術創作最重要的美學元素之一，其目的是利用空間中的物體配置，經由透視投影後，讓畫面的整體呈現平衡感；專業的、優秀的攝影作品，皆會符合攝影的基本構圖原理。因此許多的影像增強、影像合成的應用中，也應該配合相片原本的構圖設計，針對所欲表達的重點予與適當地調整，而非「盲目的」以一體適用的法則去處理每一張照片。

論文中，我們針對影像所欲表達的重點區域，分析其結構特性，設計不同的特徵，並以模糊邏輯理論為基礎，應用Mamdani系統，結合隸屬函數與攝影構圖判別法則的交互作用，用以辨認所欲處理相片的構圖類別。依據辨認後的構圖類別，即可對該影像做適當地分割及調整，以使相片能有最佳的影像增強處理。

實驗證明，本文所提出的方法能有效地辨認攝影構圖類別，針對不同攝影構圖所作的影像修正，才能更符合人眼的視覺喜好。

關鍵詞：模糊邏輯、影像特徵、圖形辨識、攝影構圖。

A Fuzzy Logic Approach for Recognition of Photographic Compositions

ABSTRACT

This thesis addresses the problem of how to recognize the photographic composition from a given photo based on the theory of fuzzy logic. Composition is one of the important aesthetics for the plane figure photo art. To present the balance of its holistic picture, it takes the advantage of special object arrangement after acting perspective projection. A piece of professional and qualified photo work will realize these basic photo composition methods. For many applications about the digital photo, the operations, i.e., photo enhancement, segmentation, output, and synthesis, all need to match up the photographic composition to do accurate processing rather than “blind” processing that assumes each photo with the same “composition.”

An automatic recognition method using image features from some specific regions is described. The method is employed in a Mamdani model and combines outputs of multiple fuzzy logic rules and feature extraction algorithms to obtain confidences that can identify the correct photographic composition.

Experimental results show that the proposed method is robust and effective for photographic composition recognition. The feature with adjusting in different photo composing will be able to comfort our human sight.

Keywords: Fuzzy logic, image features, pattern recognition, photographic composition