

基於形態轉換的多種表情卡通肖像

摘要

隨著數位影像軟、硬體裝置上進步與普及，普羅大眾對於影像的使用不僅限於日常生活之中，更隨著網路分享概念等 Web 技術的擴張，這些數量龐大的影像，在使用上更朝向娛樂化、趣味化及個人化的範疇。本論文提出結合影像處理中的人臉特徵分析 (Facial Features Analysis) 資訊以及影像內容分割 (Image Content Segmentation) 及影像變形轉換 (Image Warping and Morphing) 等技術，設計出可以將真實照片中的人臉轉換成為卡通化的肖像，供使用者於各類媒體上使用。卡通化肖像不但具有隱藏影像細節，保留部份隱私的優勢，同時又兼具充份擁有個人化特色的表徵，透過臉部動畫的參數 (Facial Animation Parameters) 設定，我們提出的卡通化系統更容許使用者依心情，來合成喜、怒、哀、樂等不同表情。另外，運用兩種轉描式 (Rotoscoping) 及圖像變形 (Morphing) 法，以不同的合成技巧來解決不同裝置在限定顏色及效果偏好上的各類需求。

Automatic Generation of Caricatures with Multiple Expressions

Using Transformative Approach

Abstract

As the acquisition of digital images becomes more convenient, diversified applications of image collections have surfaced at a rapid pace. Not only have we witnessed the popularity of photo-sharing platforms, we have also seen strong demand for novel mechanism that offers personalized and creative entertainment in recent years. In this thesis, we proposed and implemented a personal caricature generator using transformative approaches. By combining facial feature detection, image segmentation and image warping/morphing techniques, the system is able to generate stylized caricature using only one reference image. The system can also produce multiple expressions by controlling the MPEG-4 facial animation parameters (FAP). Specifically, by referencing to various pre-drawn caricature in our database as well as feature points for mesh creation, personalized caricatures are automatically generated from the real photos using either rotoscoping or transformative approaches. The resulting caricature can be further modified to exhibit multiple facial expressions. Important issues regarding color reduction and vectorized representation of the caricature have also been discussed in this thesis.