

Foreign Book Search by Image Recognition Technology

鄭永裕、蘇慶良

E-mail: 364913@mail.dyu.edu.tw

ABSTRACT

In recent years more and more people use the online shopping to quickly locate their customized merchandise and other foreign goods. For searching the foreign goods, consumers need type in related foreign keyword. However, it is hard for a non-native person to type the foreign characters. In order to solve this problem, this study retrieves the book cover image, as a text input source, whereby to locate the related merchandise. The method used in this study consists of image pre-processing optical character recognition and goods searching technique. Pre-treatment process consists of extracting the text in the book cover, color conversion to gray scale, and removing unnecessary background. After this step, the edge detection and character segmentation are performed. This study judges the obtained result to determine whether the character erosion and/or expansion are needed for character segmentation. Subsequently, optical character recognition is used again to obtain a more accurate result. These characters are used again to search the needed merchandise.

Keywords : Online Shopping、Image Recognition、Information Retrieval

Table of Contents

封面內頁 簽名頁 中文摘要 iii 英文摘要 iv 誌謝 v 目錄 vi 圖目錄 ix 表目錄 xi 第一章 緒論 1.1 研究動機 1 1.2 研究目的 2 1.3 研究流程 2 1.4 研究架構 4 第二章 文獻探討 2.1 灰階影像 5 2.2 鍊碼 6 2.3 數學形態學基本運算 6 2.3.1 膨脹 7 2.3.2 侵蝕 8 2.4 雜訊濾鏡特性 10 2.4.1 銳化濾鏡 10 2.4.2 雜訊濾鏡 11 2.5 光學字元辨識 12 2.6 錯覺 13 2.7 邊緣檢測 14 2.8 快速傅立葉變換 16 第三章 書籍影像前處理 3.1 流程架構 20 3.2 辨識前處理流程 21 3.3 色彩轉換 21 3.4 應用數學形態學的影像處理 22 3.5 濾鏡效果 24 3.5.1 中間值濾波法 24 3.5.2 銳化 25 3.6 細線化 26 3.7 調整文字後的相關討論 28 第四章 光學字元影像辨識處理 4.1 引導使用者處理影像之探討 29 4.1.1 背景圖像 29 4.1.2 文字圖像 30 4.2 封面的擷取字元辨識 34 4.3 可辨識的文字限制範圍 37 4.4 內文的擷取字元辨識 39 4.5 辨識結果與討論 40 第五章 實驗結果與分析 5.1 文字獲取與階段處理 45 5.2 合併排列相同字元 48 5.3 階段實驗處理與方法決策選擇 52 5.4 關鍵字的搜索應用 67 5.4.1 關鍵字搜尋結果網頁實驗 69 5.4.2 搜尋行為因素 73 5.5 實驗結果分析討論 74 第六章 結論 6.1 結論 76 6.2 未來展望 76 參考文獻 78

REFERENCES

- [1]N. Stamatopoulos, B. Gatos, I. Pratikakis and S. J. Perantonis, " Goal- Oriented Rectification of Camera-Based Document Images, " IEEE Trans. Image Process., vol. 20, no. 4, pp.910 - 920, 2011.
- [2]Ching-Liang Su, " Signal Gain and Correlation to Identify Iris, Journal of Computational and Theoretical Nanoscience, " EI, SCI (MATERIALS SCIENCE, MULTIDISCIPLINARY 123/212, IF 0.899) ,2010.
- [3]X. Chen, J. Yang, J. Zhang and A. Waibel, " Automatic detection and recognition of signs from natural scenes, " IEEE Trans. Image Process., vol. 13, no. 1, pp.87 -99, 2004.
- [4]S. J. Lu, B. M. Chen and C. C. Ko, " A partition approach for the restoration of camera images of planar and curled document, " Image and Vision Computing, vol. 24, no. 8, pp. 837-848, 2006.
- [5]L. Likforman-Sulem, A. Zahour and B. Taconet, " Text line segmentation of historical documents: a survey, " International Journal on Document Analysis and Recognition, vol. 9, no. 2, pp. 123 – 138, 2007.
- [6]M. S. Brown, M. Sun, R. Yang, L. Yun and W. B. Seales, " Restoring 2D Content from Distorted Documents, " IEEE Transactions on Pattern Analysis and Machine Intelligence, vol.29, no.11, pp.1904-1916, 2007 [7]Brijmohan Singh, Sudhir Goswami, Puneet Goyal, and Ankush Mittal A Robust Thinning Algorithm for Straightening of Curved Text Line.
- [8]周燕麗(2006), 不同網路購物生活型態者對購物網站之體驗偏好研究, 國立交通大學傳播研究所碩士論文。
- [9]邱哲、符滔滔、王學松(2010), 開發專屬個人的搜尋引擎, 上奇資訊。
- [10]洪偉騰(2005), 以SOPC實現投影與樹狀決策之光學字元辨識, 國立台灣科技大學電子工程系碩士論文。
- [11]鄭文璋(2005), 在次像素精準度下的邊緣偵測演算法及其應用, 銘傳大學資訊傳播工程學系碩士論文。
- [12]方惠珊(2007), 肺腺癌細胞之電腦輔助圖形辨識, 國立雲林科技大學資訊管理系碩士論文。
- [13]吳宗憲(2011), 非共平面文件影像透視矯正, 國立中央大學資訊工程研究所碩士論文 [14]連國珍(1999), 數位影像處理. 臺北市: 儒林

圖書有限公司。