

記錄編號	3321
狀態	NC088FJU00392006
助教查核	
索書號	
學校名稱	輔仁大學
系所名稱	資訊工程學系
舊系所名稱	
學號	487516060
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論文名	利用歐幾里德距離之隨機產生分散式點法

稱 (中)	
論 文 名 稱 (英)	Randomized Dispersed Dots Generation by Euclidean Disance Method
其 他 題 名	
指 導 教 授 (中)	連國珍
指 導 教 授 (英)	Brian K. Lien
校 內 全 文 開 放 日 期	不公開
校 外 全 文 開 放 日 期	不公開
全	

文不開放理由	
電子全文送交國圖.	同意
國圖全文開放日期.	2005.01.01
檔案說明	電子全文
電子全文	01
學位類別	碩士
畢業學年度	88
出版年	

語文別	英文
關鍵字(中)	半色調法 字型 拼字半色調法 誤差擴散法 顆粒性 非自然形式的圖案
關鍵字(英)	Halftoning Font Orthography Halftoning Error Diffusion Graininess Artifact
摘要(中)	<p>當我們要把影像直接在螢幕上顯示或是經由印表機列印的時候,常常會需要將影像放大.而且通常一張有連續色調的影像不能直接給二元裝置,如一般的印表或是二元顯示器,做處理.因此需要利用一種叫半色調法的技術來做影像的前置處理,再將處理過後的資料直接交給二元裝置做輸出.在半色調法的領域上,有不少的方法,但是如果以影像輸出的品質或視覺效果來考量的話,誤差擴散法是大家公認的一個相當不錯的方法.然而,誤差擴散法是一個蠻耗時間的方法,所以如果我們又要將影像做放大的話,那麼誤差擴散法的處理時間將會跟放大的比例成正比.為了以節省處理時間來做考量,拼字半色調法是一個尚可以接受的方法.它以一個M乘N的字型來取代原本連續色調的影像的一個像素.拼字半色調法的優點是當我們必需先將連續色調的影像放大然後在使用半色調法在此影像上,它可以同時做這兩件事,如此一來就能夠節省許多處理時間.但是拼字半色調有其缺點,就像其他會產生有週期性的圖案的半色調法一樣,它也遭受類似的問題.拼字半色調法的缺點是由於只用單一個字型來取代相同灰度值的像素,故當我們用此半色調來處理一張灰度值變化不大的影像時,所產生的輸出影像中會有規律性的圖案存在.由於我們人眼對這些規律性的圖案很敏感,容易查覺到它們的存在,因此我們不希望所產生的輸出影像有這些規律性的圖案.除此之外,如果拼字半色調法的字型不夠好時,會很容易產生一些突兀的圖案來影響整張輸出影像的效果.隨機位置拼字半色調法[6]利用多組的字型來重製相同灰度值的像素,如此一來克服了由於單一字型所造成的問題.在拼字半色調法?,字型必須事先決定好,而在隨機位置拼字半色調法?,這些多組的字型是在程式執行時,經由放入一些黑點或是白點於字型中所產生的.然而隨機位置拼字半色調法不是完美的,因為它沒有去控制點的分佈情形,因此導致在頻譜分析圖中存在不少的低頻能量的存在.這也就是有些細微的顆粒在輸出影像存在的原因.在本篇論文中,我們提出了一個新的方法,叫做利用歐幾里德距離之隨機產生分散式點法.我們也是用隨機產生多組字型來克服單一字型所造成的問題.在字形中的點,會被兩兩地隔開一些距離,這樣可以避免因為點聚在一起而產生顆粒狀圖案的情形.換句話說,這個方法可以減少在頻譜分析圖中低頻的能量,而且把可能產生的顆粒的大小給變小或者讓顆粒消失.而且因為此方法也算是隨機產生字型,因此具有非週期性字型和非相關性結構所帶</p>

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摘要 (英)	<p>An Image often needs to be enlarged when it is displayed on the monitor or is printed. Also, an image file which is always not a bi-level one can't be directly processed by binary output devices such as printers or binary monitors. Therefore, we need a halftone technique to do image pre-processing. In order to keep good quality, error diffusion is an acceptable choice. But the processing time of error diffusion increases exponentially as the enlarging times increases. In order to save processing time, orthography halftoning is the best method, it replaces each pixel in a continuous-tone image with an M by N font (Normally, a 4x4 font). The advantage of orthography algorithm is that when we have to scale up a continuous-tone image before applying halftoning algorithm to that image, orthography halftoning can do both things at the same time, consequently shorten the processing time considerably. But orthography does possess disadvantages, just like other periodic halftoning methods, orthography suffers from the correlated periodicity. Because orthography algorithm uses only one font to reproduce one gray level, the textures created from a uniform area exhibit structure or fixed pattern. Besides, it is common to see some dramatic texture in the halftoned image. Random position orthography halftoning solve the problems of fixed patterns by using multiple fonts, which reproduce the same gray level fonts to render one gray level. Those fonts are created at run-time for each pixel in the image by putting desired dots into the font randomly. Nevertheless, random position orthography halftoning still has the predicament which possess energy at very low frequencies, so it results in a grainy appearance. In this paper, we propose a new algorithm, called Randomized Dispersed Dots Generation by Euclidean Distance Method, to generate multiple fonts. The dots in the font will be separated by moderate distance, so as to prevent from dots clustering. In other words, we can reduce both the numbers and the sizes of the graininess, and since this new algorithm create fonts fairly randomly, it enjoys the benefits of aperiodic, uncorrelated structure.</p>
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論文頁數	83
附註	
全文點閱次數	
資料建置時間	
轉檔日期	
全文檔存取記錄	
異動記錄	M admin Y2008.M7.D3 23:17 61.59.161.35