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Novel Binary Image Produced by Blockwise Thresholding of Gray Image

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ABSTRACT:
Making of processed binary image, either line work or halftone from gray image is an age old technology. Various authors have invented various types of processed binary images. Here author has taken an initiative to produce a binary image which is quite new. This binary image produced may be used in digital imaging science to produce special binary image like line-work or halftone approximation.

Keywords: Binary image, block-size, blockwise, imaging, thresholding

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I. INTRODUCTION

Various line and halftone works [1] have enlightened this field. Still this has not lost its glories. In this paper author has introduced one new binary image of category line work. This experiment is done in Matlab 6.1 environment.

II. EXPERIMENTAL PROCEDURES

A gray gradient, sample image (Figure 1) is taken and three output processed images are taken from that, they are Figure 2, Figure 3 and Figure 4. The second input sample image (Figure 6) is 600 dpi. Three special binary processed image outputs are taken here. They are Figure 7, Figure 8 and Figure 9. These three binary image outputs are based on block size that is used to get the binary image.

2.1 Algorithm:

1. An input gray image is taken.
2. Then blockwise thresholding is done in a tiling manner to get the final binary output image.

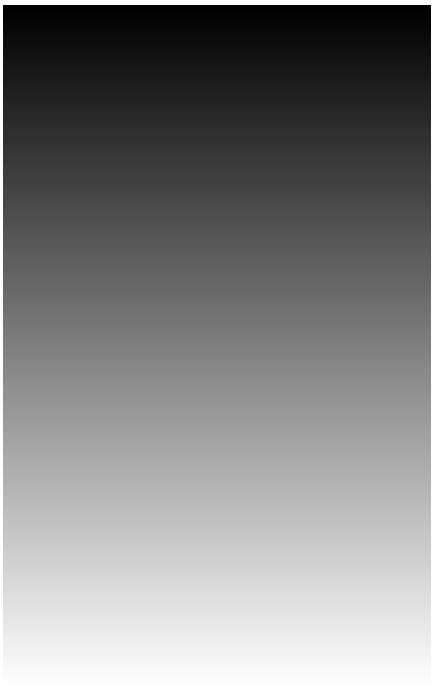

FIGURE 1: SAMPLE GRAY GRADIENT

IMAGE FROM 0 TO 255

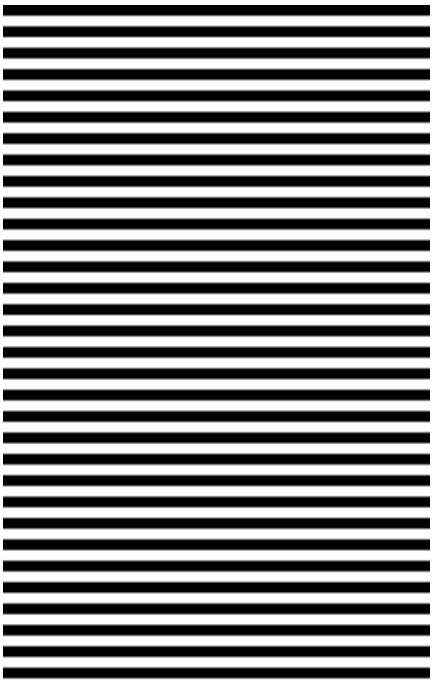

FIGURE 2: BLOCK SIZE 8 PIXELS X 8 PIXELS

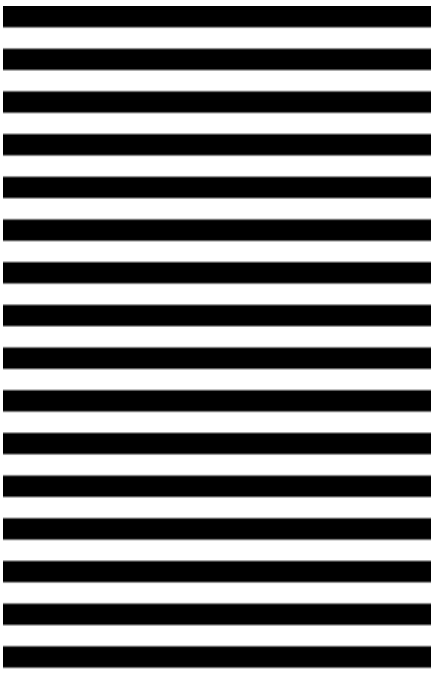

FIGURE 3: BLOCK SIZE 16 PIXELS X 16 PIXELS

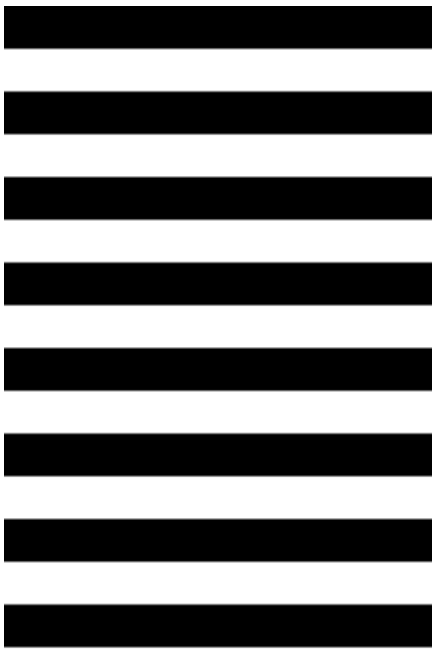

FIGURE 4: BLOCK SIZE 32 PIXELS X 32 PIXELS

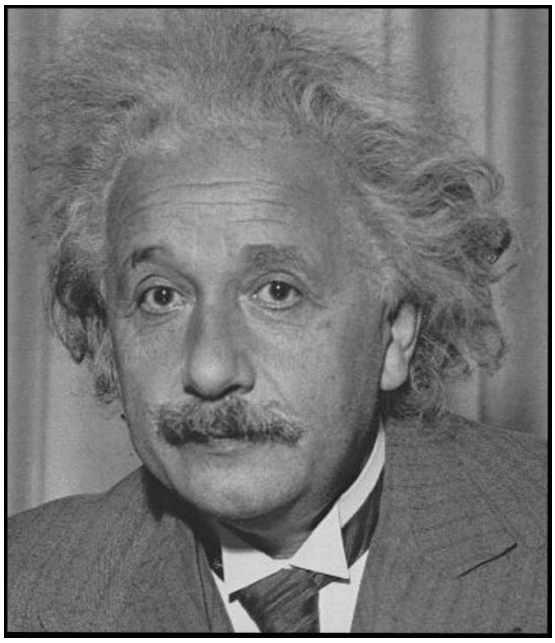

FIGURE 5 SAMPLE IMAGE

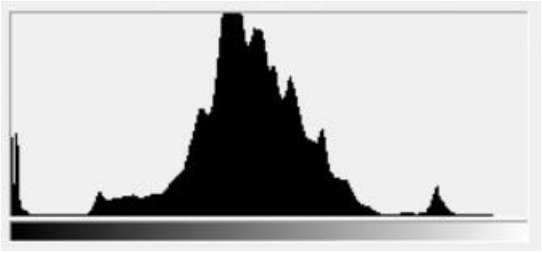

FIGURE 6 : HISTOGRAM OF THE SAMPLE OF FIGURE 5

FIGURE 7 (EBT3.TIF) BLOCK SIZE 8 PIXELS X 8 PIXELS

FIGURE 8 (EBT4.TIF) BLOCK SIZE 16 PIXELS X 16 PIXELS

FIGURE 9 (EBT5.TIF) BLOCK SIZE 32 PIXELS X 32 PIXELS

III. RESULTS AND DISCUSSIONS

The output images (Figure 2, Figure 3 and Figure 4) when compared shows that gray gradient input image of Figure 1 is converted into uniform line work depending on block size of processing the image. Thicker lines are shown in the images depending on the blocksize.

As the block size increases artifacts are visible in the binary images hampering image quality. It is more prominent in Figure 9. As the block size decreases fine lines of output images generates uniform tone.

IV. CONCLUSIONS

In this paper the author has presented one new technique of generating binary image that is not similar to conventional halftone or dithering. This is a special line art showing image outlines image details in grouped dot patterns.This method is a special application of generating line work from gray images.

REFERENCES

[1] Kundu, P. and Pal, A.K., 2010, “Some Methods of Non-halftone Binary Image Transformations”, International Journal of Intelligent Information Processing, Volume 4, Number 2, July-December 2010, pp 165-170.