

Producing Binary Halftone from Multitone Halftone and Gray Image

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Abstract:

This paper has explored a less common idea like multitone halftoning. Author has produced binary halftone from multitone halftone image and original gray image.

Keywords:

Multitone halftone, binary halftone, pattern

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I. Introduction

Any gray image consisting of more than two gray levels and with halftone pattern can be called as multitone halftone. Binary halftones are two level halftones producing various shades with white space and black pixels. These are commonly used in imaging science. Here author has presented a new technique of producing binary halftone from multitone halftone.



Figure 1: Gray blank



Figure 2: Histogram of Figure 1

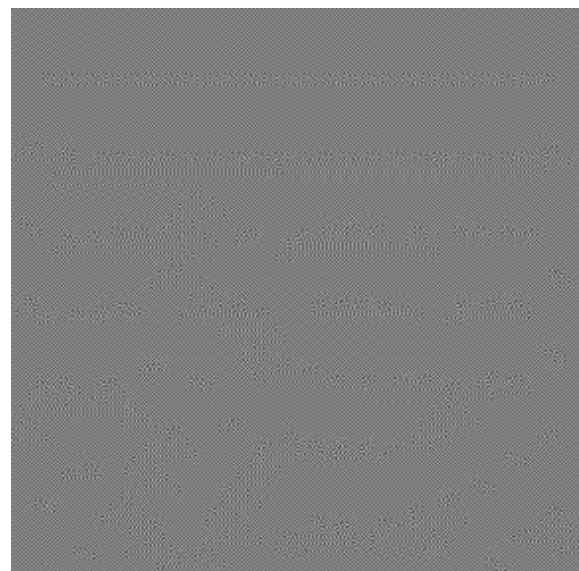


Figure 3: Floyd Steinberg halftone of Figure 1



Figure 4: Histogram of figure 3

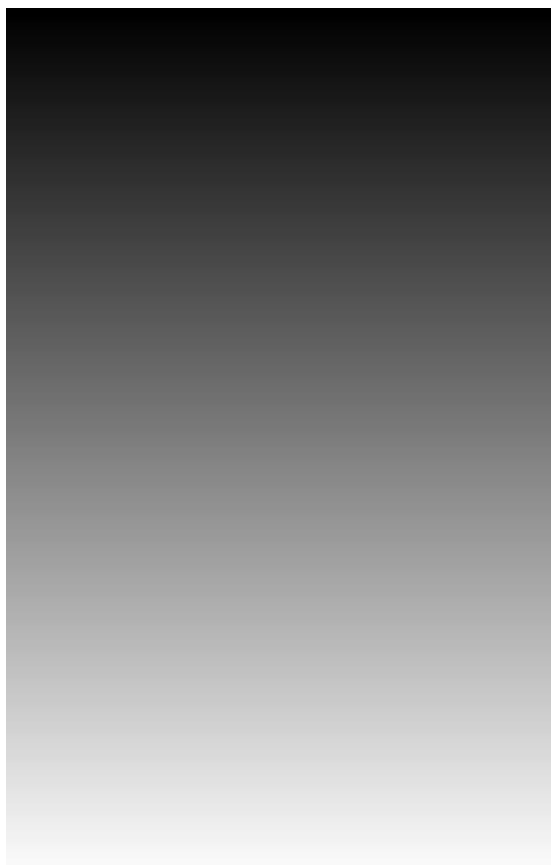


Figure 5: Gray gradient

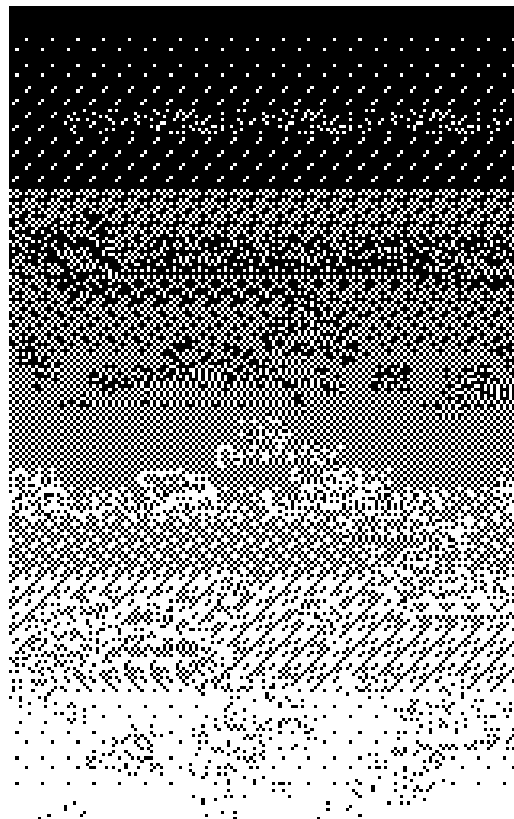


Figure 6: Binary halftone

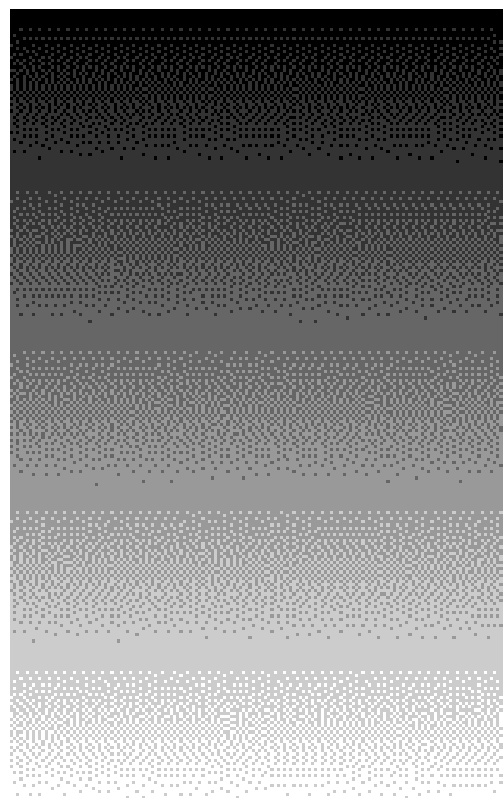


Figure 7: Multitone halftone

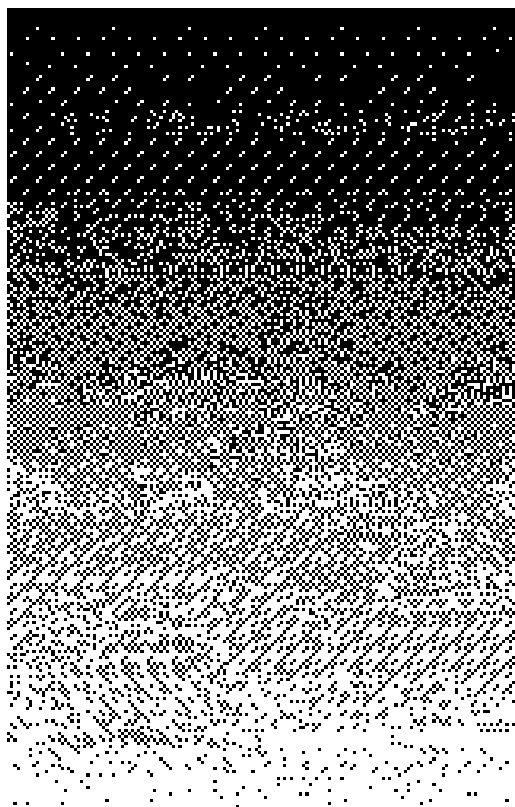


Figure 8: Binary halftone

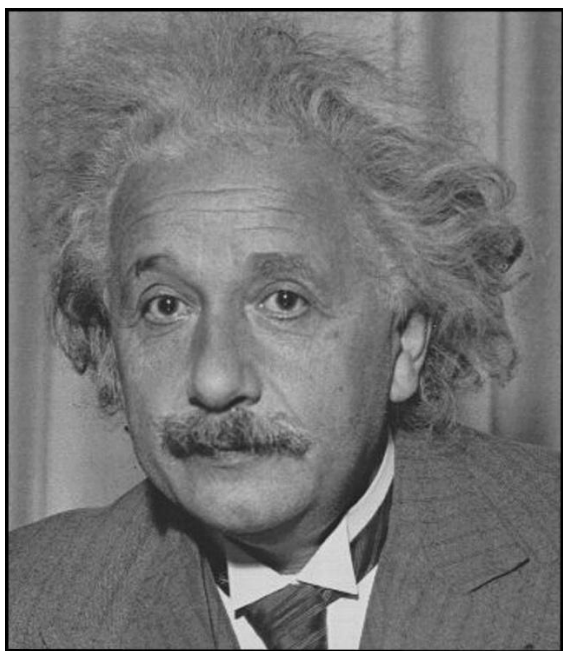


Figure 9: Sample gray image

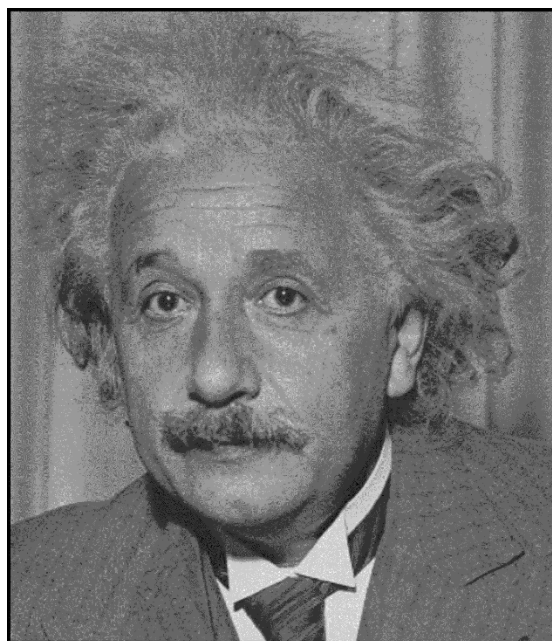


Figure 10: Multitone halftone



Figure 11: Histogram of Figure 10

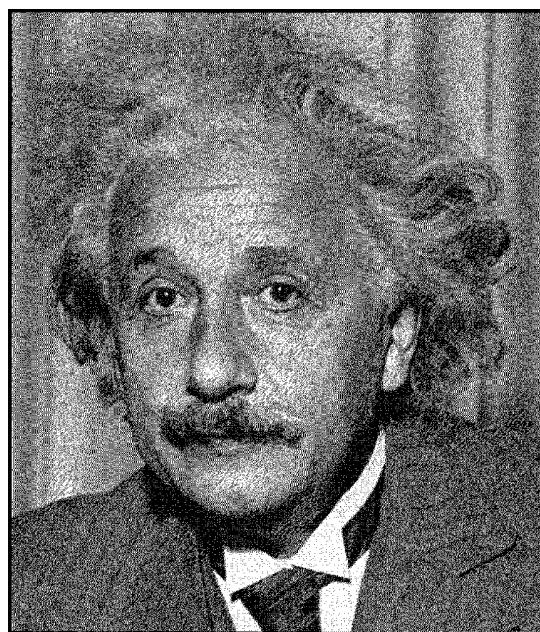


Figure 12: Binary Floyd Steinberg halftone

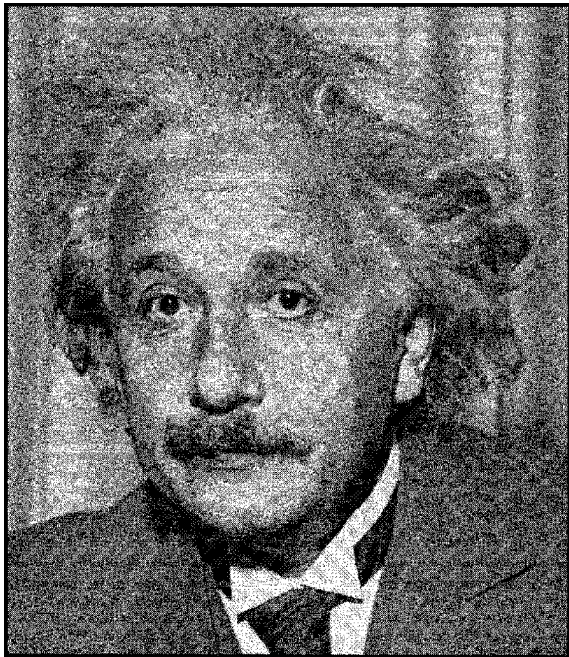


Figure 13: Binary halftone of Figure 10

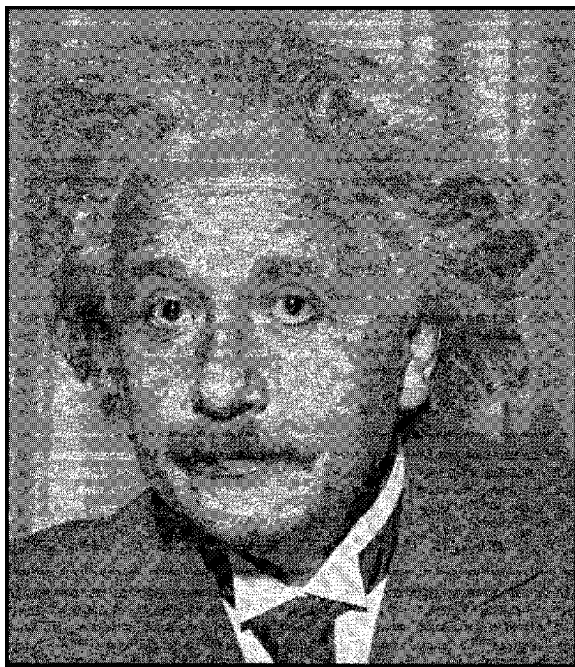


Figure 14: Binary halftone

II. Experimental procedures

Figure 1 is a gray blank sample produced by filling the blank with red 128, green 128 and blue 128 (50% black). Figure 3 is a pattern produced by multitone dithering (Floyd and Steinberg) of Figure 1. Figure 5 is a gray gradient image sample. Figure 6 is a binary halftone produced by halftoning with figure 3. Figure 7 is a multitone halftone produced by pattern of figure 3. Figure 8 is produced by

halftoning (through pattern of figure 3) figure 7. Figure 10 is a multitone halftone that is evident from the histogram of figure 11. Figure 12 is the original binary Floyd Steinberg dithering. Figure 13 is a binary halftone of figure 10. Figure 14 is a binary halftone of figure 9 which is a gray sample.

III. Results and Discussions

Here in two ways binary halftoning 1. Through patterning of original sample image and 2. Through patterning of multitone halftone image. Final binary halftone images produced are of reasonable good quality. Any multitone dithering can be taken here as source of experiment like Floyd Steinberg dithering and patterning with dithered pattern produced by Floyd Steinberg. Halftone image of figure 13 is clearer with fewer artifacts, than figure 14.

IV. Conclusions

Here author has presented binary halftones produced from multitone halftone. Multitone halftone is very difficult to produce on various printers. This type of halftone is very much useful for coarse halftone reproduction on various substrates and on monitor screen reproduction as a softcopy.

ACKNOWLEDGEMENTS

1. Adobe Photoshop 7.0, Adobe Systems Incorporated, 1990-2002, USA
2. GNU Image Manipulation Program 3.0.4, 1995-2025

References

- [1]. Kundu P. and Kiran Pal A.: Some Novel Methods of Ordered Dither, *Acta graphica* 26(2015)4, 5-10