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Generating A New Kind of Binary Image from Gray Image by High Pass Filtering and Thresholding

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Abstract: A new kind of binary image, generated from gray image, is presented here. In this work binary image is created with the help of high pass filter and ordinary thresholding.
Keywords: Binary image, binarization, high pass filter, thresholding

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I. Introduction

Here author has presented a new kind of binary image, generated from gray image using high pass filter and a simple image binarization method like thresholding.

II. Experimental procedures

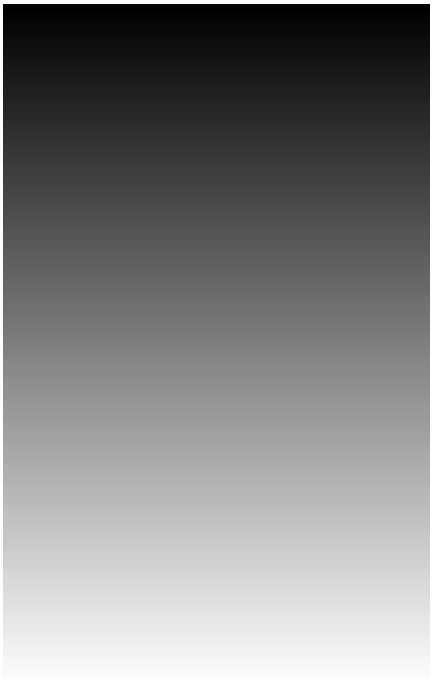

Figure 1: Gray gradient (0-255) where each gray level has one line of width 160 pixels, height 1 pixel and 72 dpi

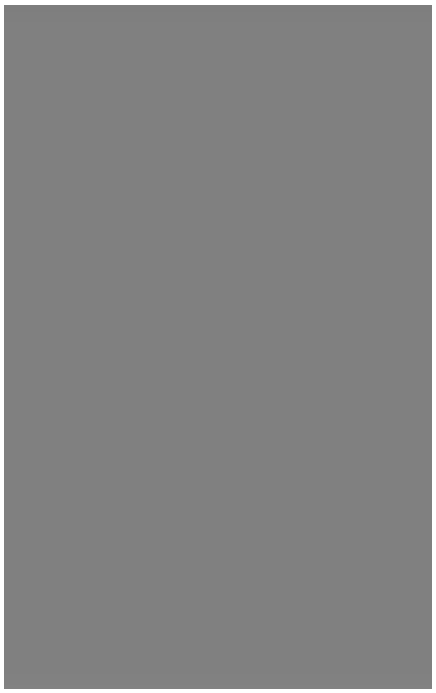

Figure 2: Figure 1 filtered through highpass filter with fillter weight 6 (Resolution 72 dpi)

Figure 3: Histogram of figure 2

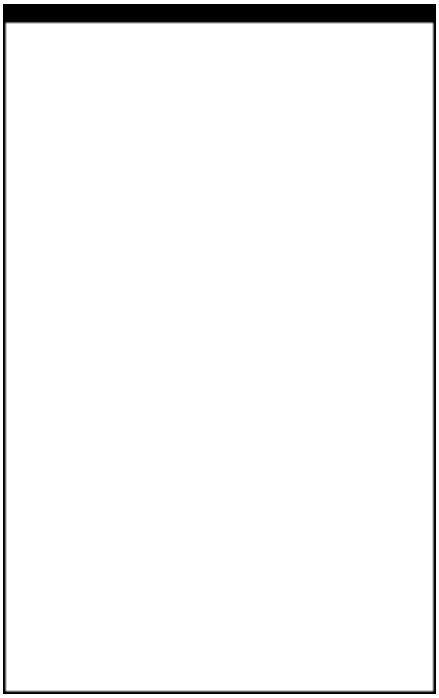

Figure 4: Figure 2 thresholded (50%)

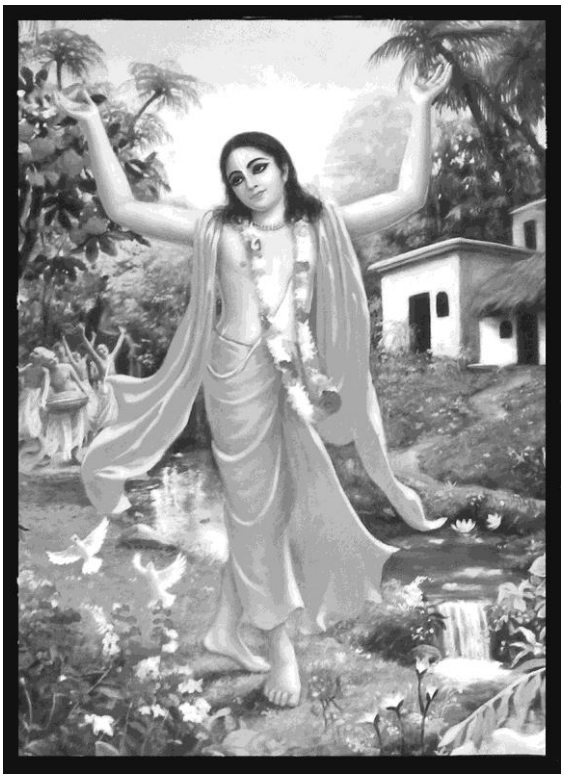

Figure 5: Original sample gray image (300 dpi)

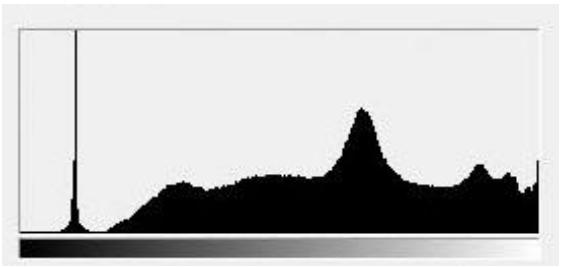

Figure 6: Histogram of image of Figure 1

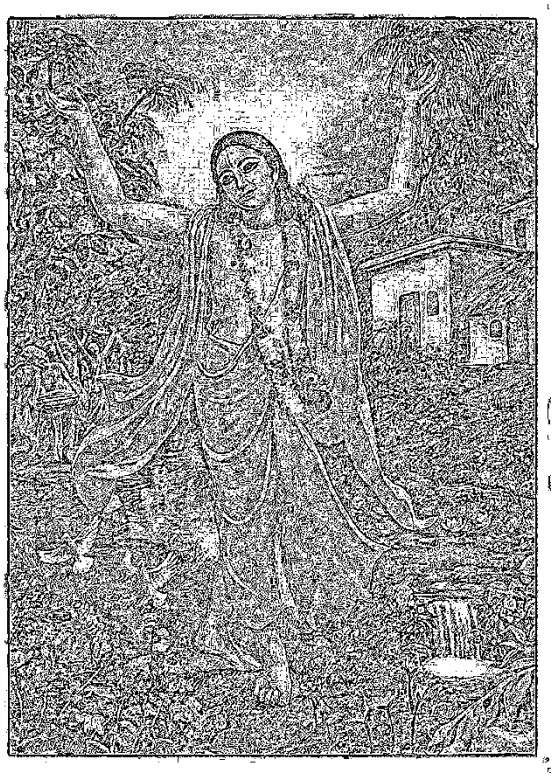

Figure 7: Resolution 300 dpi with filter weight 1

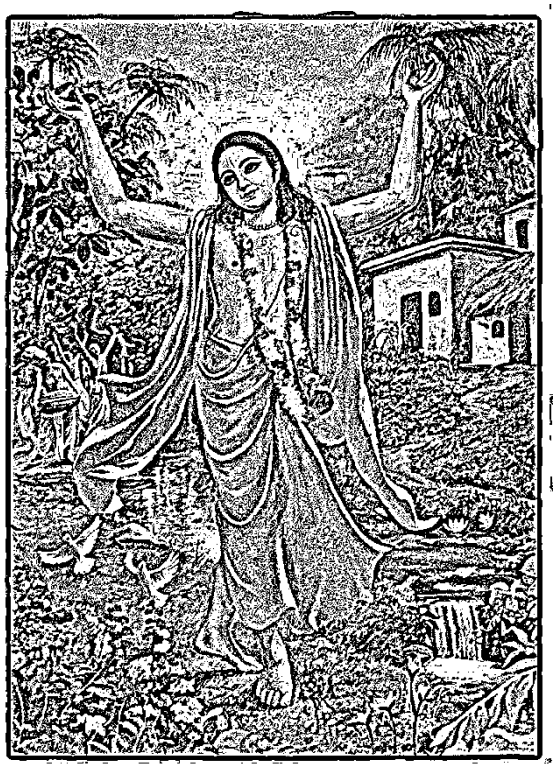

Figure 8: Resolution 300 dpi with filter weight 3

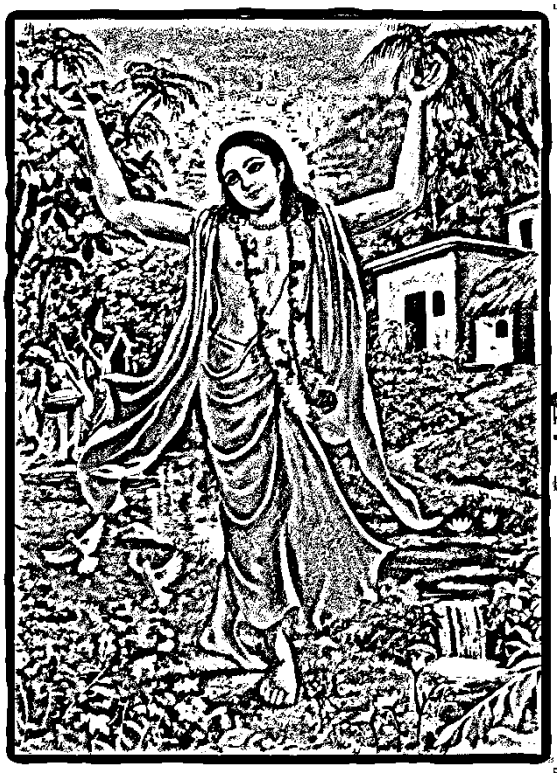

Figure 9: Resolution 300 dpi with filter weight 6

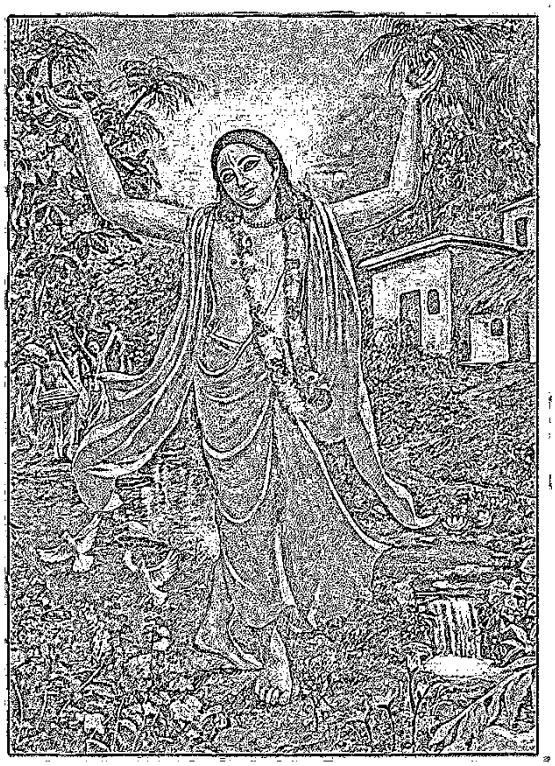

Figure 10: Resolution 1200 dpi with filter weight 6

Figure 1 is a sample gray gradient image. Figure 2 is the histogram of figure 1. Histogram shows that the figure 1 has image details are mostly in highlight and midtone areas. High pass filter is applied on figure 1. After application of high pass filter, ordinary threshold (50%) is applied. Figure 7 with weight 1, figure 8 with weight 3 and figure 9 with weight 6, are the processed images. Figure 10 is a high resolution (1200 dpi) image with filter weight 6.

III. Results and Discussions

As we increase the weight while processing, the image becomes more prominent with more dark lines. Image details are more with less weight. Image clarity is less for figure 7, but image clarity is more for figure 8 and figure 9 and figure 10.

IV. Conclusions

The processed binary images presented here are neither true halftone nor true line work. The processed used here is relatively faster with low DPI. The processed images may find special applications in digital imaging science.

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.