

ANALYSIS OF VARIOUS BINARIZATION TECHNIQUES

*Dissertation submitted in
Partial fulfilment of the requirement
For the award of the degree of*

Master of Technology
in
Signal Processing and Digital Design
by
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CERTIFICATE

This is to certify that the dissertation titled “**ANALYSIS OF VARIOUS BINARIZATION TECHNIQUES**” is a bona-fide record of work done by **ABHILASH GAUR, Roll No. 2K15/SPD/01** at **Delhi Technological University** for partial fulfilment of the requirements for the award of degree of Master of Technology in Signal Processing and Digital Design Engineering. This project was carried out under my supervision and has not been submitted elsewhere, either in part or full, for the award of any other degree or diploma to the best of my knowledge and belief.

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DECLARATION

I hereby declare that the project entitled “**ANALYSIS OF VARIOUS BINARIZATION TECHNIQUES**” being submitted by me is a authentic work carried out under the supervision of **Asst. Professor N. Jayanthi** , Electronics and Communication Engineering Department, Delhi Technological University, Delhi.

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(SIGNAL PROCESSING AND DIGITAL DESIGN)

Abstract

Enhancement of deteriorated document images is one of the striking and demanding researches in present time. Deteriorations in an image are due to uneven illumination scattered over document including smudging of text, bleeding through of ink to the other side of page, aging of document causing degradation of paper ink. Binarization of an image is a method of separating pixel intensities into two sets, white fall in background and black are termed as foreground. Thresholding is a significant phenomenon for image binarization. On the large scale thresholding is classified into two categories: global thresholding and local thresholding. Images in which contrast is uniformly distributed between foreground and background e.g. document images, global thresholding is preferred. Document images in which discrepancy in illumination and contrast exists, there lies various pixels that are difficult to classify as foreground or background. Binarization incorporating local thresholding is better suitable for these kinds of cases. In the past many binarization techniques are proposed, but a single technique suitable for all types of degradation. For choosing the best method of binarization for various degraded images there is no automatic and robust system available. Each binarization technique used to enhance the degraded image has some pros and cons. This thesis holds a comprising survey of binarization techniques and explains a new binarization method using Gradient Correlation Similarity decolourization method with standard log based Nick's thresholding algorithm. The results of various methods are compared with respect to parameters e.g. Precision Rate, recall rate, DRD, MRM, fMeasure etc. This thesis also highlights the various issues encountered related to document image binarization.

TABLE OF CONTENTS

Declaration	iii
Acknowledgement	iv
Abstract	v
Table of Contents	vi
List of Figures	viii
List of Table	x
Chapter 1: Introduction	1
1.1 Importance of Binarization	4
1.2 Problem Definition:	4
1.3 Overview of work done	6
1.4 Thesis Layout	Error! Bookmark not defined.
Chapter 2: Related Work	Error! Bookmark not defined.
Chapter 3: Comparison of Various Standard Binarization Techniques	Error! Bookmark not defined.
3.1 Thresholding Methods:	Error! Bookmark not defined.
3.2 Result and Discussion:	Error! Bookmark not defined.
3.3 Conclusion:	Error! Bookmark not defined.
Chapter 4: A Novel Approach for Text Extraction from Natural Scene Images:	Error! Bookmark not defined.
defined.5	
4.1 Gaussian Filter and Difference of Gaussian:	Error! Bookmark not defined.
4.2 Niblack's Adaptive Thresholding Algorithm:	Error! Bookmark not defined.
4.3 Pre-processing:	Error! Bookmark not defined.
4.4 Edge Detection using modified Difference of Gaussian:	Error! Bookmark not defined.
4.5 Morphological Operations:	Error! Bookmark not defined.
4.6 Character Extraction:	Error! Bookmark not defined.

4.7 Experimental Results:	Error! Bookmark not defined.
4.8 Conclusion	Error! Bookmark not defined.
Chapter 5: A Novel Contrast Preserving Binarization Technique	Error! Bookmark not defined.
5.1 GcsDecolor: Gradient Correlation Similarity for Efficient Contrast Preserving Decolorization	Error!
Bookmark not defined.	
5.2 Proposed Method:	Error! Bookmark not defined.
5.3 Experimental Results:	Error! Bookmark not defined.
5.4 Conclusion:	Error! Bookmark not defined.
Chapter 6: Conclusion	Error! Bookmark not defined.
Appendix-1	Error!
Bookmark not defined.	
References	51

LIST OF FIGURES

Fig.1 (a) Original Image “PR1.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(17)

Fig.2 (a) Original Image “PR2.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(18)

Fig.3 (a) Original Image “PR3.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(18)

Fig.4 (a) Original Image “PR4.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(19)

Fig.5 (a) Original Image “PR5.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(19)

Fig.6 (a) Original Image “PR5.jpg” (b) Nick’s Thresholding Result (c) Niblack’s Algorithm Result (d) Sauvola Thresholding Result (e) Bernsen’s Binarization Result (f) Otsu’s Thresholdig Result.....(20)

Fig 7: (a) (e) Input Image; (b) (f) Output of Prewitt Edge Detection Algorithm; (c) (g) Output of Gaussian Edge Detection Algorithm; (d) (h) Output of Proposed Method.....(29)

Fig 9: (a) Input Image form [25] (b) Output of Proposed Algorithm.....(30)

Fig 10: (a) Input Image form ICDR2015 Training Dataset[33] (b) Output of Proposed Algorithm (c) Input image from [26] (d) Output of Proposed Algorithm.....(30)

Fig. 11 (a) Original Image “PR1.jpg” (b) Decolorized Image (c) Result of Nick’s Thresholding after Decolorization (d) Nick’s Thresholding Output (e) Proposed Method Output.....(39)

Fig. 12 (a) Original Image “PR2.jpg” (b) Decolorized Image (c) Result of Nick’s Thresholding after Decolorization (d) Nick’s Thresholding Output (e) Proposed Method Output.....(40)

Fig. 13 (a) Original Image “PR2.jpg” (b) Decolorized Image (c) Result of Nick’s Thresholding after Decolorization (d) Nick’s Thresholding Output (e) Proposed Method Output.....(40)

Fig. 14 (a) Original Image “PR4.jpg” (b) Decolorized Image (c) Result of Nick’s Thresholding after Decolorization (d) Nick’s Thresholding Output (e) Proposed Method Output.....(41)

Fig. 15 (a) Original Image “PR5.jpg” (b) Decolorized Image (c) Result of Nick’s Thresholding after Decolorization (d) Nick’s Thresholding Output (e) Proposed Method Output.....(42)

LIST OF TABLES

Table 1: Experimental Results of Nick's Thresholding Algorithm.....	(21)
Table 2 Parameters of Niblack's Thresholding Algorithm	(21)
Table 3 Parameters of Sauvola's Thresholding Algorithm.....	(22)
Table 4: Parameters of Bernsen's Binarization Algorithm.....	(22)
Table 5: Parameters of Otsu's Thresholding Results.....	(23)
Table 6: Comparison of evaluated results.....	(31)
Table 7: Parameters of Nick's Thresholding Results.....	(43)
Table 8: Parameters of Nick's Thresholding Results after GCS based Decolorization.....	(44)
Table 9: Parameters of Proposed Method.....	(44)
Table 10 Comparison of performance parameters.....	(45)