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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Under the guidance of

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2015-2017

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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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ACKNOWLEDGEMENT

Generally, individuals set aims, but more often than not, their conquest are by the efforts of not just one but many determined people. This complete project could be accomplished because of contribution of a number of people. I take it as a privilege to appreciate and acknowledge the efforts of all those who have, directly or indirectly, helped me achieving my aim.

I take great pride in expressing my unfeigned appreciation and gratitude to my learned mentor **Mrs. N. Jayanthi, Assistant Professor** Department of Electronics and Communication Engineering, DTU for this invaluable inspiration, guidance and continuous encouragement throughout this project work. His critics and suggestions on my experiments have always guided me towards perfection. This work is simply the reflection of their thoughts, ideas, concepts and above all his efforts. Working under their guidance has been a privilege and an excellent learning experience that I will cherish for a long time.

I am also grateful to Prof. S.Indu, HOD, Department of Electronics and Communication Engineering, DTU for his immense support. I would also acknowledge DTU for providing the right academic resources and environment for this work to be carried out.

Finally, I extend my deep appreciation to my family and friends, for all that they meant to me during the crucial times of the completion of my project.

ABHILASH GAUR

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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.

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