

Image and Video Processing Coursework

CS3330: Image and Video Processing Coursework: Document Image Binarization

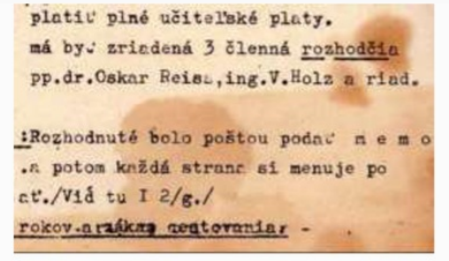
Damon Tran

Student Number: 160111190

Background

What is the aim of document image binarization?

Document image binarization is a method that is used for essentially taking an image of a text document and separating different objects within it, using various approaches via thresholding on a grayscale image, in order to separate the text from the rest of it to make it more readable [1] . The typical documents you would use this on, would be where the image is affected by various variables that make the document hard to read as displayed in figure 1 [2] below. You can see that the black text although visible, it is slightly difficult to see due to the dark patches and stains of the document.



Figure

Why is binarizing a document image useful? (hint: binarization is a mid-level image processing technique, and the output of mid-level techniques is often fed into high-level techniques).

It is useful because mid-level processes take an image as an input, analyses and processes the image to obtain the relevant attributes which are then passed to a high-level processing technique [3]. Essentially acting as an early phase in the processing pipeline, setting the image up for other steps to achieve a goal.

• What are the existing approaches to document image binarization? Briefly outline THREE different algorithms for document binarization found through your research and discuss the way in which the aims and performances of these algorithms differ in academic literature.

Existing approaches to document image binarization

(Note they differ because the approaches are only good depending on context, context mean that they are being applied to different images and thus different goals it is unfair to say that one algorithm is better than the other at something because they have different aims)

There are many approaches but the three I have researched and found are Parker, Eikvil and Sauvola.

The Parker algorithm is based off the idea when you binarize and image with a threshold value it is impossible to find a single value that can do it efficiently for the whole image, so it uses multiple threshold values over various sub-regions which are derived from each pixel to solve the problem of thresholding an image which is affected by illumination [4].

**References**

1. Karthika M, Ajay James , A Novel Approach for Document Image Binarization using Bit-Plane Slicing, Romania , Tirgu-Mures, 2014.
2. (PICTURE NEED TO REFERENCE IT ask ben)
3. Dr. Harry Goldingay, Image and Video Processing CS3330 Introduction, Aston University.
4. J. R. Parker, C. Jennings, Thresholding Using an Illumination Model, ICDAR ’93, Japan, 1993.