

## **Document Image Binarization Using Image Segmentation**

**(To binarize the degraded image or document)**

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### **Abstract:**

Segmentation of text from badly degraded document images is a very challenging task due to the high inter/intra variation between the document background and the foreground text of different document images. Image processing and pattern recognition algorithms take more time for execution on a single core processor. Graphics Processing Unit (GPU) is more popular now-a-days due to their speed, programmability, low cost and more inbuilt execution cores in it. The main goal of this research work is to make binarization faster for recognition of a large number of degraded document images on GPU.

### **Introduction**

Document Image Binarization is performed in the preprocessing stage for document analysis and it aims to segment the foreground text from the document background. A fast and accurate document image binarization technique is important for the ensuing document image processing tasks. Though document image binarization has been studied for many years, the thresholding of degraded document images is still an unsolved problem due to the high inter/intravariation between the text stroke and the document background across different document images. Given a degraded document image, the text stroke edges are detected through the combination of the Gray Scale Image and New Image Segmentation will generate Clear Binarized Image. Generating a clear Binarized document image from degraded document image for that we are using one approach serial approach. We are using the one approach just to speed up the execution of the system. For large size document images we will apply parallel approach and for small size document image we will be applying serial approach. Because parallel approach will not be suitable for small size images it will take more time for execution because in parallel approach memory will be allocated for every thread so it will take more time for execution so we will apply serial approach in that case and if size of image is more than we will apply parallel approach because serial approach will take more time for execution as size of image is more so we will apply serial approach.

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## **Hardware Requirement**

### **a. 2GBRAM**

Minimum 2 GB RAM should be available on customer's computer

### **b. I3 Processor**

These processors are designed with cheap price point, while still retaining the power of the Intel core line as such they are often found in laptops and low end desktop computers .

## **Software Requirement**

### **1. Visual Studio 2010**

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps. Visual Studio uses Microsoft software development platforms such as Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight. It can produce both native code and managed code

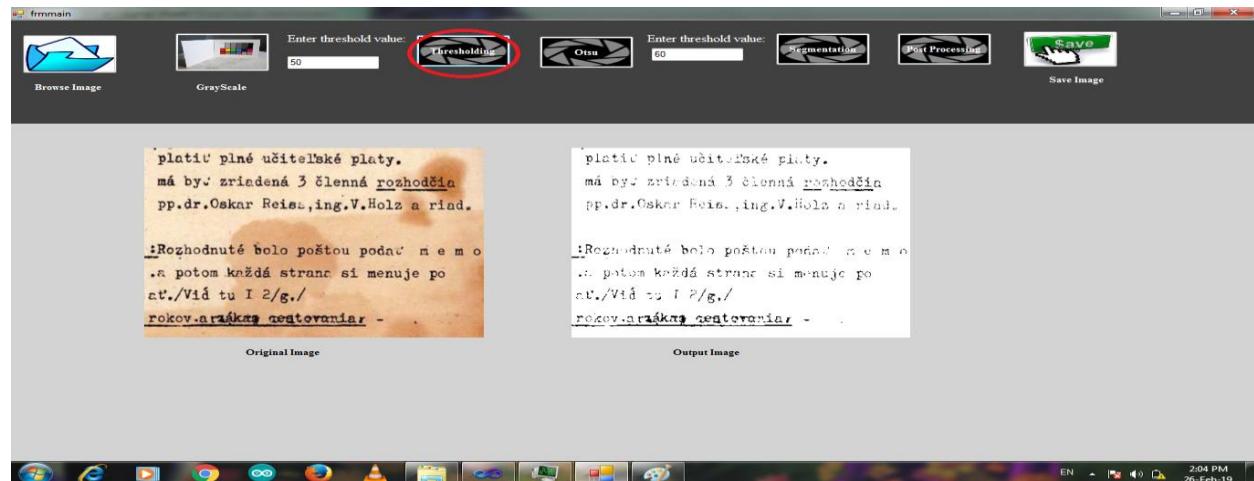
### **2. C#.Net**

C# .NET Framework is Microsoft's comprehensive and consistent programming model for building applications that have visually stunning user experiences, seamless and secure communication, and the ability to model a range of business processes. The .NET framework 4 works side by side with older Framework versions. Applications that are based on earlier versions of the Framework will continue to run on the version targeted by default.

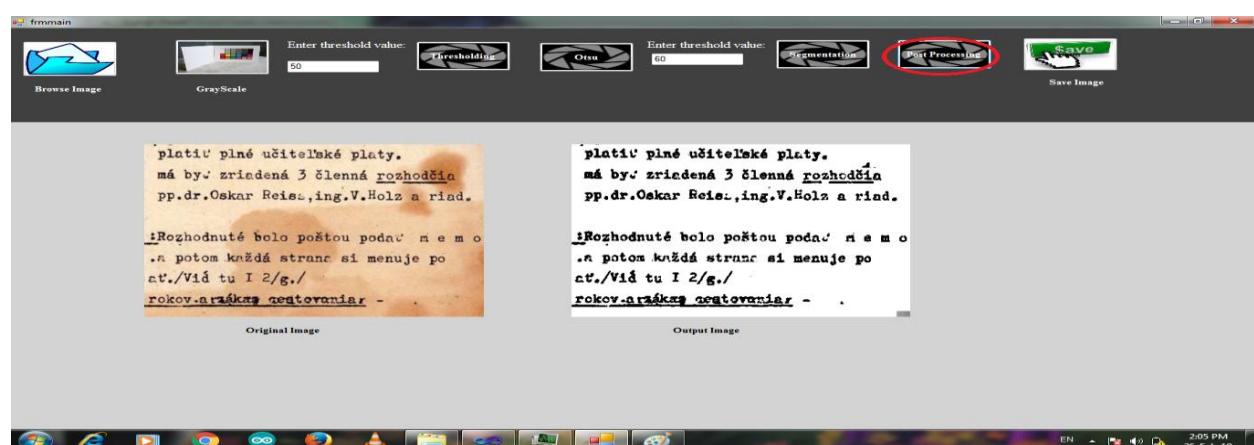
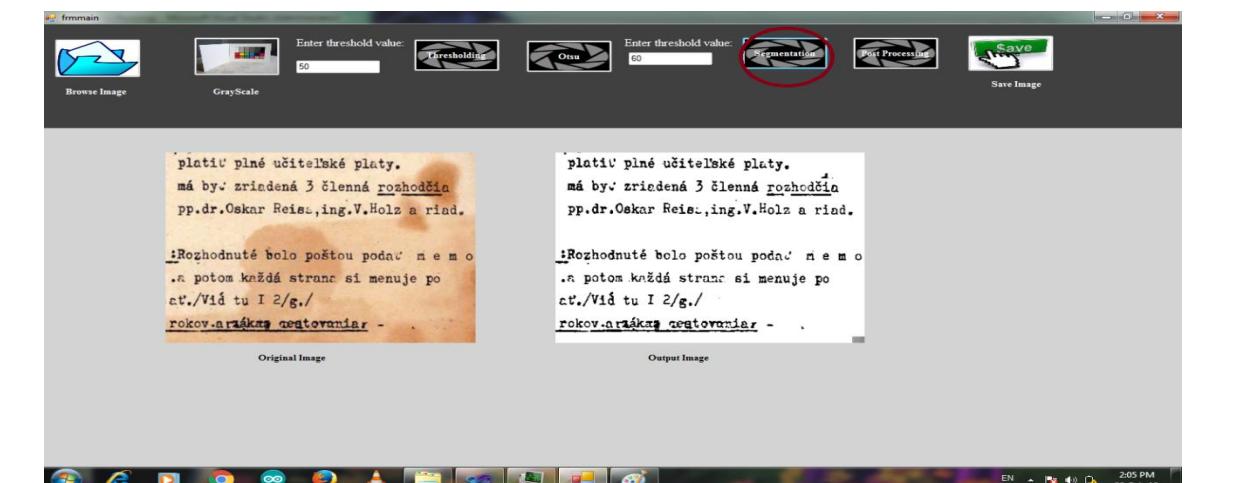
## **Working**

- Firstly we can log in to image binarization software
- Then we scan the degraded image and take it into the system
- Then we convert image into gray scale that is in black and white format
- Then in thresholding the stain is been cleared and the words are blurred
- In otsu the word become more clear but the ink stain appears on the words
- In segmentation the ink stain is removed
- In post processing all pixels are joined and we can view the proper document and at last we save the image or document.

### Thresholding Processing :



### Segmentation Processing



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## **Advantages**

1. Parallel operations on document images simultaneously.
2. Accuracy for generating clear Binarized image is up to 95%.
3. Faster execution.
4. Less time required to generate the output.
5. Working simultaneously on multiple windows of the image at the same time.

## **Disadvantages**

1. Requires compulsory graphics card for system execution.
2. Increased programmer complexity is an important disadvantage.
3. High system configuration.

## **Conclusion**

The system provides document image Binarization technique that is tolerant to different types of document degradation. The proposed technique is simple and robust, only few parameters are involved. Thus we propose Parallel Approach for Document Image Binarization Using Image Segmentation Algorithm for generating clear document image from giving degraded document image.

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