The American University in Cairo

Department of Computer Science and Engineering

CSCE 4603 Fundamentals of Computer Vision

Dr. Mahmoud Khalil Assignment 2 [10%] Fall 2019

Released October 27th, and due by end of November 7th, 2019

Submission Guidelines

- This is an individual assignment.
- Use **OpenCV** to implement this assignment.

Document Image Binarization Competition (DIBCO):

Document image binarization is an important step in the document image analysis and recognition pipeline. DIBCO 2019 competition information can be found in https://vc.ee.duth.gr/dibco2019/.

DIBCO 2009 Dataset will be used for testing which can be downloaded from http://users.iit.demokritos.gr/~bgat/DIBCO2009/benchmark/

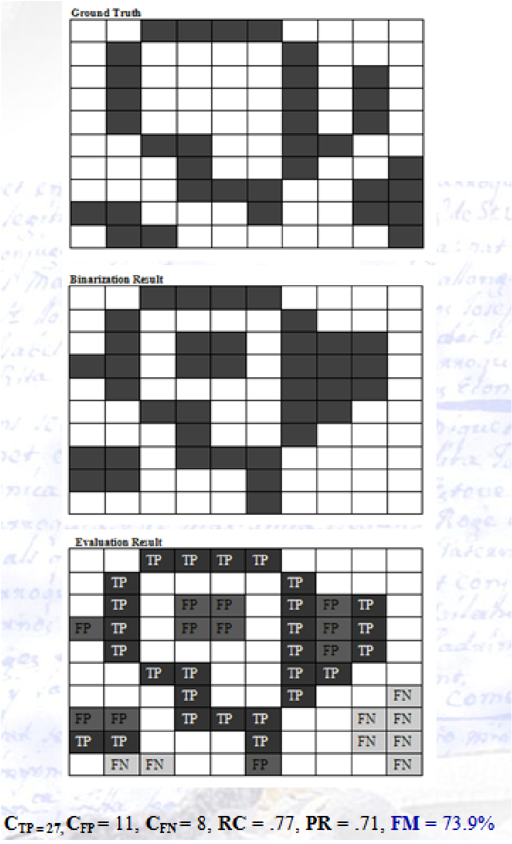
Evaluation:

- The performance evaluation will be based on a well-established technique that counts True Positive (TP), False Positive (FP) and False Negative (FN) pixels in order to calculate Recall and Precision metrics.
- A pixel is classified as True Positive (TP) if it is ON in both the GT and the Binarization Result images.
- A pixel is classified as False Positive (FP) if it is ON only in the Binarization Result image.
- A pixel is classified as False Negative (FN) if it is ON only in the GT image.
- If C_{TP} the number of TP pixels, C_{FP} the number of FP pixels and C_{FN} the number of FN pixels, Recall (RC) and Precision (PR) metrics are given as follows:

$$RC = C_{TP}/(C_{FN}+C_{TP})$$

$$PR = C_{TP}/(C_{FP}+C_{TP})$$

$$FM = (2 x RC x PR / (RC+PR)) x 100\ \%$$



		TP	TP	TP	TP				
	TP					TP			
	TP		FP	FP		TP	FP	TP	
FP	TP		FP	FP		TP	FP	TP	
	TP					TP	FP	TP	
		TP	TP			TP	TP		
			TP			TP			FN
FP	FP		TP	TP	TP			FN	FN
TP	TP				TP			FN	FN
	FN	FN			FP				FN

$C_{TP=27}$, $C_{FP} = 11$, $C_{FN} = 8$, RC = .77, PR = .71, FM = 73.9%

Deliverables:

1) Your submission should include commented source code
2) A report that includes the source code and your output images.
3) The report which describe your developed algorithm and your output samples.
4) You have to compare your results with the published results.
5) Submit one executable file which can be used as following:

   Binarize arg1 arg2
   arg1: Input gray scale or color image
   arg2: Resulting binary image