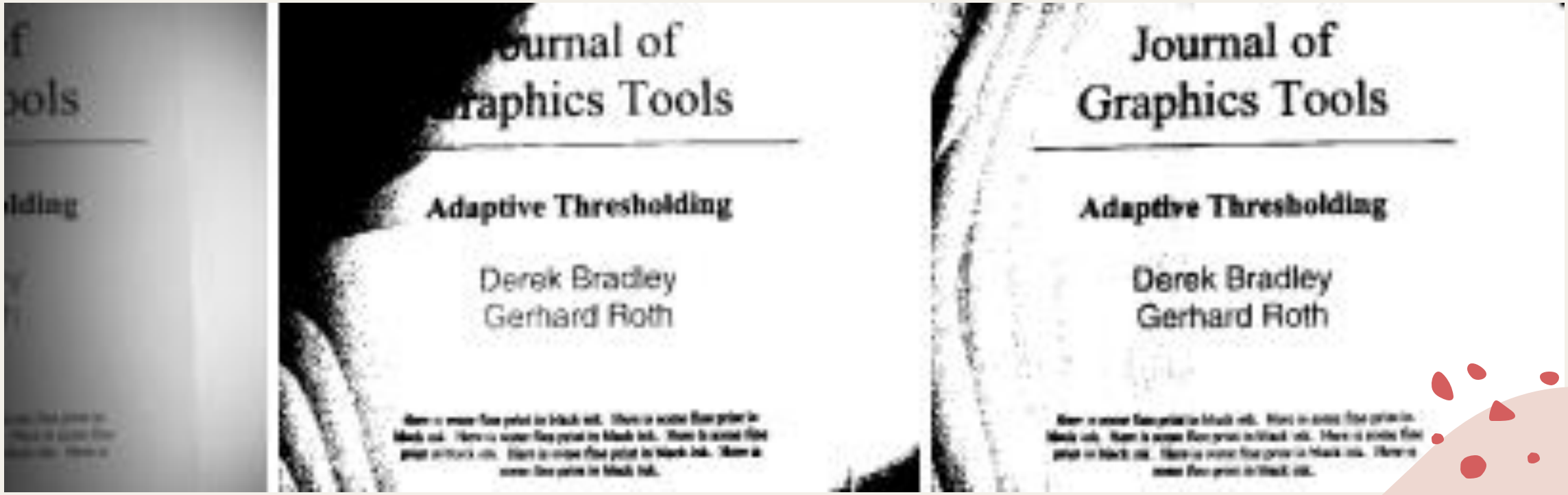
Adaptive thresholding of Document images

Tanmay Khabia

Aditya Saripalli



Abstract

We require thresholding in various document Image preprocessing to improve the visibility of the text. But using a global threshold is not able to take care of spatial variation in illumination.

To deal with this we use an adaptive threshold to counter the effect of variation in illumination in the image.

Algorithm

4	1	2	2
0	4	1	3
3	1	0	4
2	1	3	2

4	5	7	9
4	9	12	17
7	13	16	25
9	16	22	33

- Generate the integral image of the document.
  - The integral image is given by:

$$I(x,y) = f(x,y) + I(x-1,y) + I(x,y-1) - I(x-1,y-1).$$

- Where I (x,y) is the integral image at x, y position and Image pixel value is given by f(x,y)
- Using the integral image find the sum of K x K neighborhood. Use this to find the average.
- It value of the pixel is less than t% of the average then we assign It 0 else 255.
- For corner condition we do the required 0 padding.

Experimental plan

- We plan to implement this algorithm in FPGA to accelrate this thresholding operation.
- We plan to stream image and do the computation on K x K neighbourhood to find integral image and the thresholded of the pixel.
- Lastly plan compare the the performance with the opencv implementation.

Thank you