Improving Image Contrast Using Locally Adaptive Binarization Techniques

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Motivation

- Looking at ways to improve the readability of text from historical documents
- Initial solution required a pre-generated binarized image for processing
of government, is to do for whatever they need to have at all, or can not, as were in their separate council.
Our Solution

• Allows process to be used on any image even if a binarized version of the image isn’t available

• We use a local window to identify and enhance the contrast in that part of the image

• We can compare Otsu(1979) and Su(2010) algorithms.

• We allow the user to control the amount of the information from the original image to blend with the binarized image
Background - Otsu Algorithm

- Published in 1979
- Global thresholding algorithm
- Uses the image histogram to pick a threshold
- Calculates Maximum Between-class Variance (MBV) of the modes
- Chooses the threshold that allows MBV
Background - Su Algorithm

- Published at DAS 2010 (HDIBCO '10 winner)
- Local binarization method
- Performs edge detection using local min. and max.
- Approximates the width of text stroke
- Builds a small window based on the stroke width
- Performs local thresholding based on neighboring pixels
Conclusions

• Does provide a way to enhance contrast
• Speed is still an issue
• More research could provide way to tile image and generate full binarized image that could be reused instead of regenerated every time
• Improve Su algorithm
Thank You