

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- Looking at ways to improve the readability of text from historical documents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

Initial Solution

of government, is to do for
whatever they need to have
at all, or can not, so well
in their separate, answer:

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

Demo

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

