CSP 502
Computer Vision Project

Signature Detection and Verification

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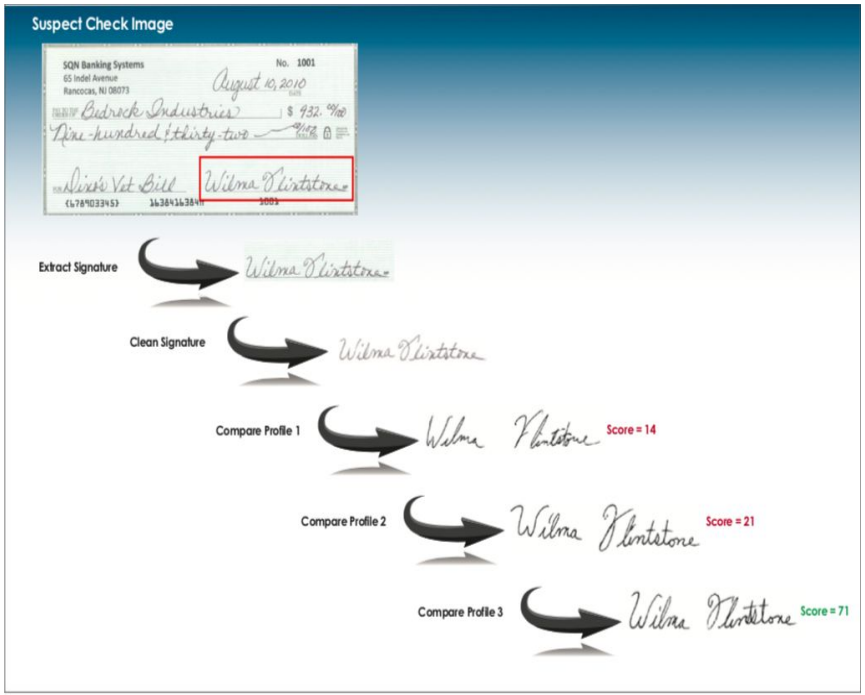
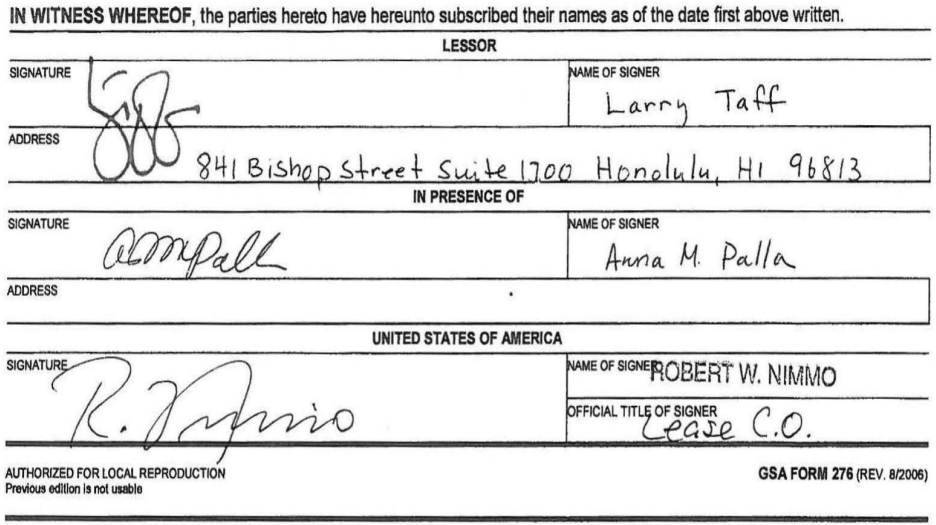
Problem Statement

- Detecting signature, localizing signature, cropping the signature and verifying the authenticity of the signature in financial documents.





IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the date first above written.

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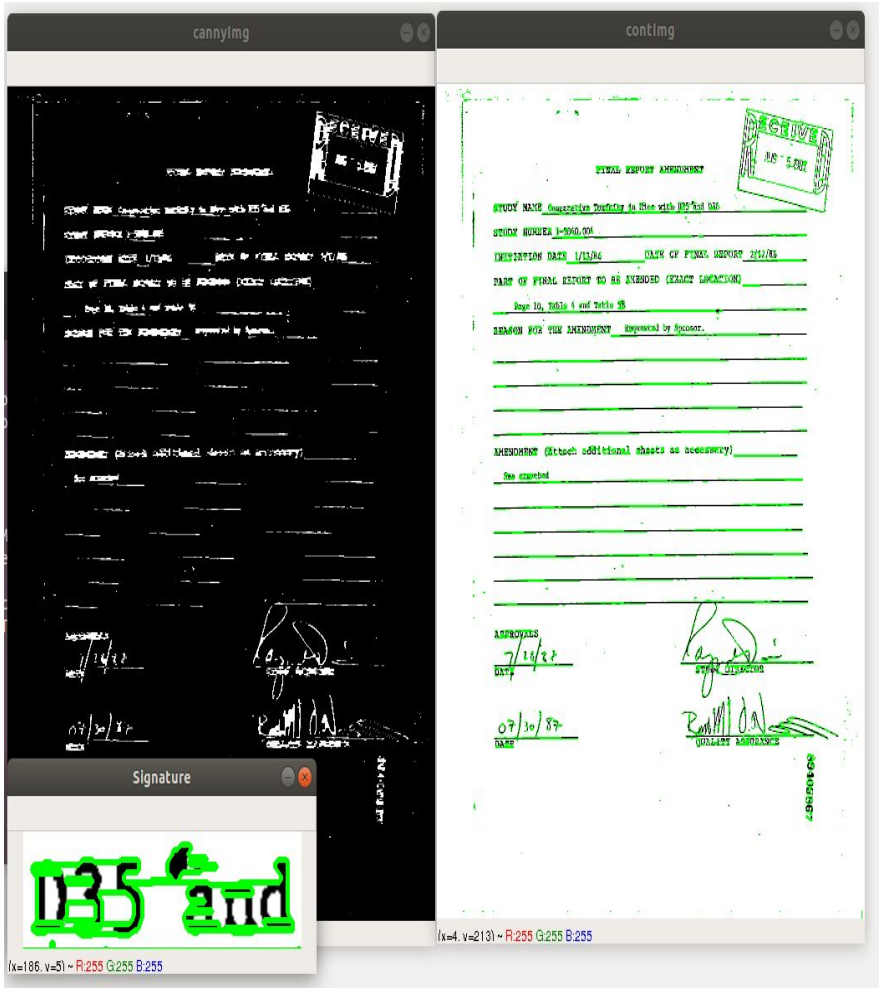
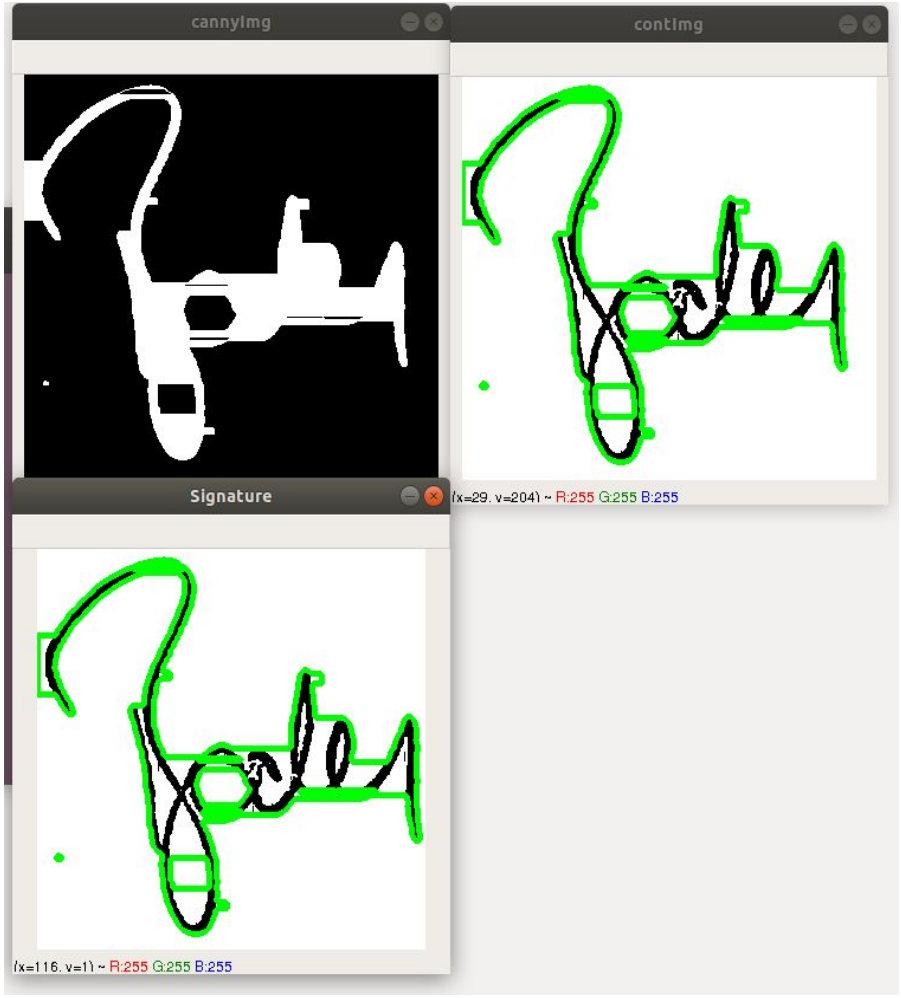
GSA FORM 276 (REV. 8/2006)

Literature Survey on Signature Detection

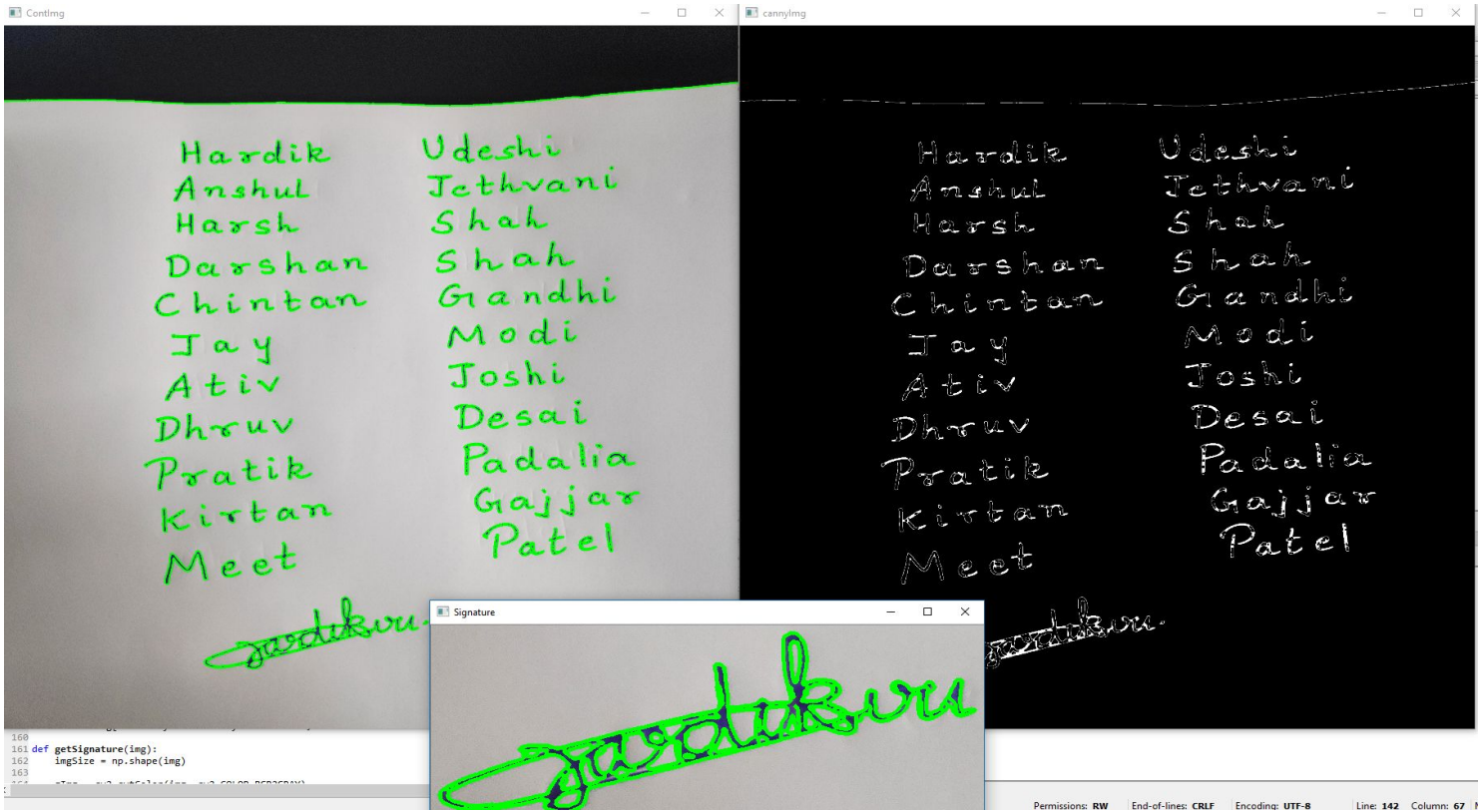
- **Approach - 1 [1]**
  - ❖ This approach is very different from other two approaches.
  - ❖ Firstly, we need to pre-process the data and so for that we need to convert the image to grayscale.
  - ❖ Then, we need to carry out edge-detection and for that we used Canny Edge Detector and for finding thresholds for Canny Edge Detection, we use Otsu Thresholding approach.
  - ❖ After that, we need to form contours based on edge-detection.
  - ❖ After that, for each individual contours, we check the number of corners present in that particular contour.
  - ❖ Then, the contour with maximum number of corners can be the signature and based on that, we can fit rectangle on that contour.

Results


cannyImg
contImg
Signature
FINAL REPORT AMENDMENT
STUDY NAME Comparative Testing in Mine with HPS and HAS
STUDY NUMBER I-5040.004
INITIATION DATE 1/15/86
DATE OF FINAL REPORT 2/11/88
PART OF FINAL REPORT TO BE AMENDED (EXACT LOCATION)
Page 10, Table 4 and Table 5B
REASON FOR THE AMENDMENT Requested by Sponsor.
AMENDMENT (Attach additional sheets as necessary)
See attached
APPROVALS
DATE
STUDY DIRECTOR
07/30/87
DATE
QUALITY ASSURANCE
(x=4, y=213) ~ R:255 G:255 B:255
(x=186, y=5) ~ R:255 G:255 B:255

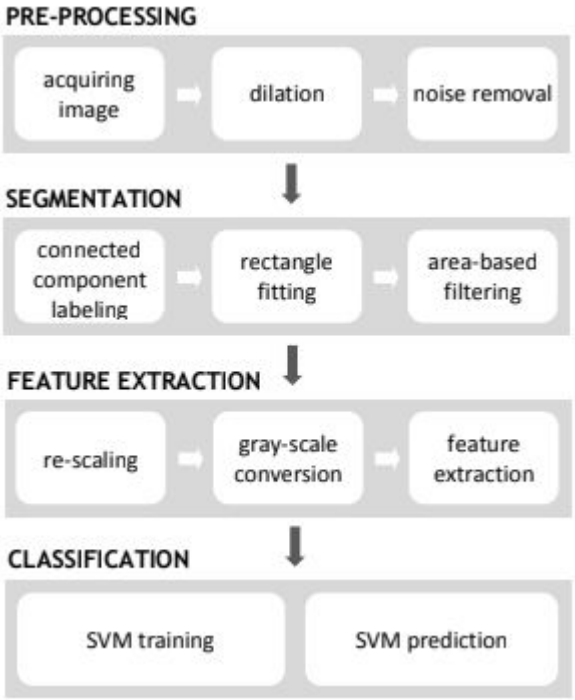

cannyImg
contImg
Signature
(x=29, y=204) ~ R:255 G:255 B:255
(x=116, y=1) ~ R:255 G:255 B:255

Results: Signature Detection on our own dataset

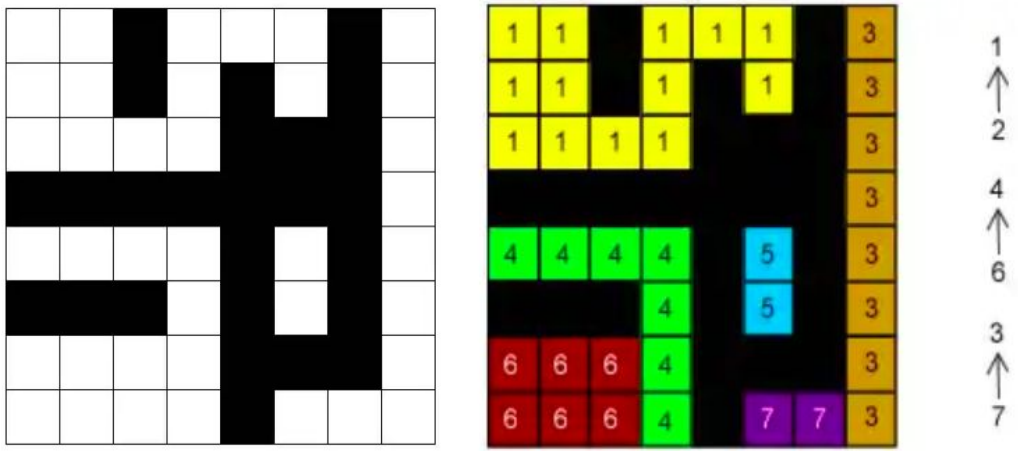


Literature Survey on Signature Detection

- **Approach-2 [2]**



Gradient
HOG
SIFT
LTP
Global
Features



Source: http://www.aishack.in/tutorials/labelling-connected-components-example/

Literature Survey on Signature Detection

- **Approach - 3 [3]**
  - ❖ Basically there are two types of text in our dataset of scanned documents of US government: printed text and handwritten text.
  - ❖ So, for that, we can train R-CNN/ Fast R-CNN / Faster R-CNN and can classify handwritten texts from other texts.
  - ❖ Now, handwritten text also contains texts like signature, date, name of the person, etc.
  - ❖ Now, we have to differentiate signatures from other handwritten texts.
  - ❖ After that, we can run OCR on handwritten texts to separate handwritten text from handwritten signatures.
  - ❖ But, it requires high computational capabilities, so it’s costly.

Literature Survey on Signature Verification [4]

- Firstly, here for Signature Verification, we need both real and forged signature.
- So, for that, we decided to take the signature we have in the signature detection dataset as real signatures and on that datasets we can train GAN for data augmentation and for forgery signatures we need to create manually datasets by drawing forgery signatures.
- Now, the approach for Signature Verification that we came across while going through our literature survey was to train the CNN and on the basis of that we can classify the test dataset that whether the signature is forgery or real.
- But, this approach requires high computational capabilities.

References

[1] https://github.com/vzat/signature_extractor - Github repository for Signature Detection

[2] Cüceloğlu, İlkhan, and Hasan Oğul. "Detecting handwritten signatures in scanned documents." In Proceedings of the 19th Computer Vision Winter Workshop, pp. 89-94. 2014.

[3] https://github.com/CatalystCode/Handwriting - Github repository for Signature Detection

[4] Alvarez, Gabe, Blue Sheffer, and Morgan Bryant. Offline Signature Verification with Convolutional Neural Networks. Tech. rep., Stanford University, Stanford, 2016.

[5] http://www.labbookpages.co.uk/software/imgProc/otsuThreshold.html - Otsu Thresholding

[6] http://iopscience.iop.org/article/10.1088/1757-899X/322/7/072057/pdf - Signature Detection Approach

Thank You