

CAPTCHA Recognition

Kalpith Thakkar (201201071)

Akash Agrawall (201202061)

Jaspreet Singh (201202078)

Project Description

- This project aims at developing a novel algorithm to solve CAPTCHAs using best approaches in image processing and Artificial Intelligence.
- We propose an approach to solve the gimpy CAPTCHA images using region properties of blobs for segmentation and a multiclass SVM classifier for the recognition of the characters in the CAPTCHA.

Steps involved

- Image Segmentation
 - Binarization (using a threshold learnt from the image)
 - Labelling the regions (blobs)
 - Getting the region properties of all the blobs, mainly bounding boxes of each
 - Cropping the letters using their bounding boxes
 - To handle collapsed letters, connected components applied again to eliminate the unwanted blobs.
- Training the Classifier
 - We use an already available dataset of English alphabets to train the multiclass SVM.

Steps Involved

- Classifying the Segmented Letters
 - Each segmented letter's features (Hu's 7 invariant transforms and Zernike moments) are extracted.
 - This vector of features is given to the trained classifier which assigns a label to the letter.

Future Work

- Try to break captcha which are secured by anti-segmentation techniques.
- Some of the Anti-segmentation techniques are Multi-font, Waving rotating, Collapsing.
- Using
 - Morphological Analysis of Characters
 - Three-Color Bar-Code

References

- The End is Nigh: Generic Solving of Text-based CAPTCHAs
<https://www.usenix.org/system/files/conference/woot14/woot14-bursztein.pdf>
- Text-based CAPTCHA Strengths and Weaknesses
<http://www.cin.ufpe.br/~rsc3/temp/text-based-captcha-strengths-and-weaknesses.pdf>

Thank you!