
COSE474-2024F: Final Project Proposal

reCAPTCHA Solver By YOLO11

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1. Introduction

reCAPTCHA is a system designed to prevent automated bots from accessing websites, ensuring that only real users can interact with certain functions. For example, in various scenarios such as logging in or posting comments, we must pass reCAPTCHA to verify our humanity and proceed with our actions.

2. Problem definition & challenges

However, reCAPTCHA can be time-consuming, and in cases where the answers are difficult to determine, users may feel frustrated due to incorrect answers and experience further delays. To address these issues, we aim to utilize the newly released YOLO 11(Redmon & Farhadi, 2024) image deep learning model, which was launched in September, to solve this problem.

Additionally, through this work, we intend to highlight the limitations of reCAPTCHA v2 and raise awareness among websites that still widely use it, despite the release of reCAPTCHA v3.

3. Related Works

Table 9 of the paper(Hossen et al., 2020) indicates that many reCAPTCHA solving services are available. According to the table, 2Captcha shows a success rate of 93%within a time frame of over one minute. We aim to enhance accuracy and reduce time using the latest image model, YOLO.

Service	Success Rate (%)	Speed (s)
2Captcha	98.2	73.11
Anti-Captcha	92.4	83.99
BestCaptchaSolver	67.2	93.42
DeathByCaptcha	96.2	78.33
Imagetyperz	73.0	131.4
Hossen	83.25	19.93

Table 1. Comparison of captcha solving services

4. Datasets

The image dataset corresponding to Google reCAPTCHA v2 will be sourced from Kaggle(MAZUROV, 2022) for testing purposes.

5. State-of-the-art methods and baselines

YOLO11 classification models are pretrained on the ImageNet dataset (ultralytics).

YOLO11n-cls on the MNIST160 dataset for 100 epochs at image size 64. For a full list of available arguments see the Configuration page.

Validate trained YOLO11n-cls model accuracy on the MNIST160 dataset. No arguments are needed as the model retains its training data and arguments as model attributes.

6. Schedule & Roles

- **By November 20:** Model evaluation and modifications will be completed.
- **By November 30:** A demo of the model will be produced.
- **By December 10:** The final report will be drafted and submitted.

References

Hossen, M. I., Tu, Y., Rabby, M. F., Islam, M. N., Cao, H., and Hei, X. An object detection based solver for google's image recaptcha v2. In *23rd international symposium on research in attacks, intrusions and defenses (RAID 2020)*, pp. 269–284, 2020.

MAZUROV, M. Google recaptcha image dataset. <https://www.kaggle.com/datasets/mikhailma/test-dataset>, 2022. Google Recaptcha V2 Image Dataset with partially hand-marked images for YOLO.

Redmon, J. and Farhadi, A. Yolo11. <https://docs.ultralytics.com/>, 2024. A popular object detection and image segmentation model developed at the University of Washington.

ultralytics. Imagenet dataset. <https://github.com/ultralytics/ultralytics/blob/main/ultralytics/cfg/datasets/ImageNet.yaml>. YOLO11 Classify models pretrained dataset.