

Development of a Model for Reading CAPTCHA Characters

Team : ToNight
DL project of DAY

1 Team details

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2 Project Statement

The project aims to develop an advanced model capable of recognizing and interpreting characters in CAPTCHA input. By overcoming the challenge of distinguishing between distorted or obscured characters, which serve as an automated entry prevention mechanism on websites, this model seeks to push the boundaries of current AI capabilities in pattern recognition.

3 Motivation for solving this problem

As artificial intelligence progresses, its ability to interpret complex visual data has seen significant advancements. This project is motivated by the potential to leverage these AI advancements for automating the solving of CAPTCHA mechanisms, traditionally designed to deter automated access. Solving CAPTCHAs automatically could significantly benefit various fields, including accessibility for users with disabilities, testing of automated services, and improving AI's understanding of distorted or obscured texts and images.

4 Specific Objectives

4.1 Task Description

Input : Distorted character images
Output : Original characters

4.2 Dataset

- MNIST database(dataset for single-digit numbers)
- EMNIST database(dataset for single characters and single-digit numbers)
- Easy CAPTCHA datasets for alphabet sequences
- CAPTCHA datasets in three levels

4.3 Approach

- Curriculum Learning 1 : Train the model using individual characters to enhance its understanding of characters. After training the model with individual characters, further train it to enhance its ability to

recognize words. To recognize distorted words, additional training with relevant datasets is necessary.

- Curriculum Learning 2 : Collecting diverse CAPTCHA image datasets through Kaggle. CAPTCHA images are classified into three main stages based on the level of recognition difficulty. The first stage focuses on relatively simple alphabet recognition, while the second stage transitions to word formation recognition. In the final third stage, challenges arise with highly complex CAPTCHA images due to significant variations in word arrangement, background noise, and overlapping characters. Utilizing CAPTCHA datasets from each stage, models are trained incrementally, allowing them to progressively develop the ability to recognize more complex patterns and variations.

5 Results expected

Upon successful completion of the project, we anticipate the following outcomes:

- Development of an artificial intelligence model capable of accurately recognizing characters in CAPTCHA inputs.
- Enhanced efficiency in automated CAPTCHA solving, potentially reducing human intervention in accessing websites with CAPTCHA mechanisms.