



CAPTCHA IMAGE CLASSIFICATION

CAPTCHA

Completely **A**utomated **P**ublic **T**uring-test to tell **C**omputers and **H**umans **A**part

BACKGROUND

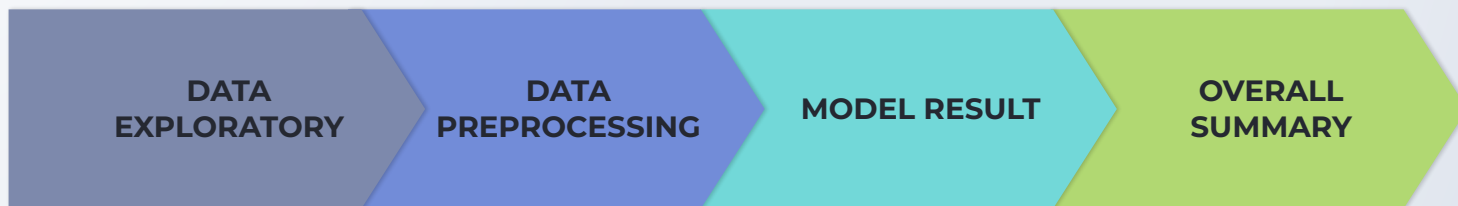
Some jobs require access to a website repeatedly which means they need to pass the captcha test over and over again. For example, a credit analyst who has to check credit scores on the Pefindo website.

Automation in the captcha test will make their work process easier and can increase productivity.

OBJECTIVE

Creating a Deep Learning model with the Convolutional Neural Network (CNN) method to assist the process of identifying captcha images with the aim of ease the process of a job that requires frequent access to websites that use captcha.

OUTLINE





1.

DATA EXPLORATORY

ABOUT THE DATA

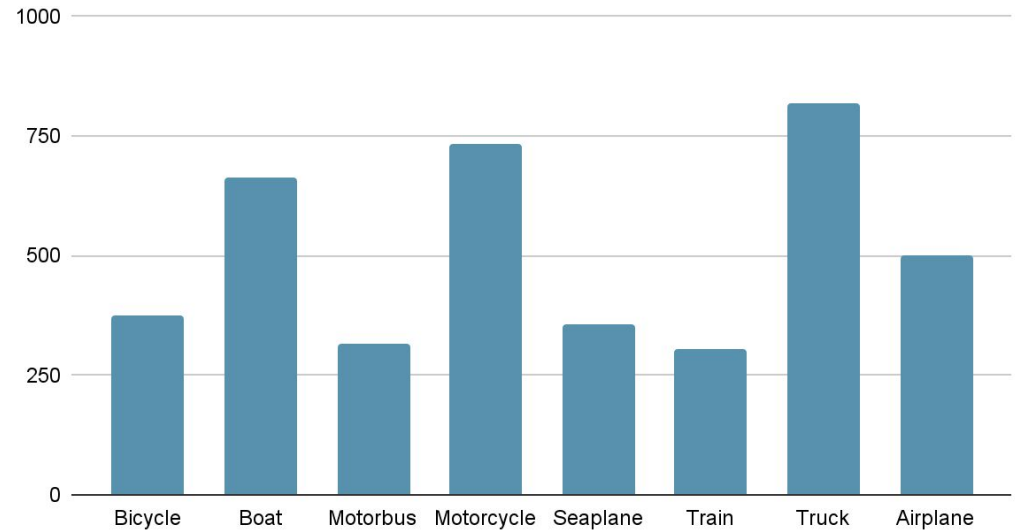
There is an example of the images from our captcha dataset. All of the images are low-resolution images of a vehicle with a size of 128 x 128 pixels and 144 x 144 pixels.



ABOUT THE DATA

- The dataset consists of 4068 images that divided into eight labels
- The label with the most number of images is Truck and the label with the least number of images is Train

Total Image per Label





2.

DATA PREPROCESSING

PREPROCESSING WORKFLOW

Resizing and Batching

Define the size and batch of the images which will be used for creating the CNN model.

Normalisation

Rescaling the pixel values so that they lie within a confined range

Optimization

Using prefetch to decouple the time when data is produced from the time when data is consumed.

Augmentation

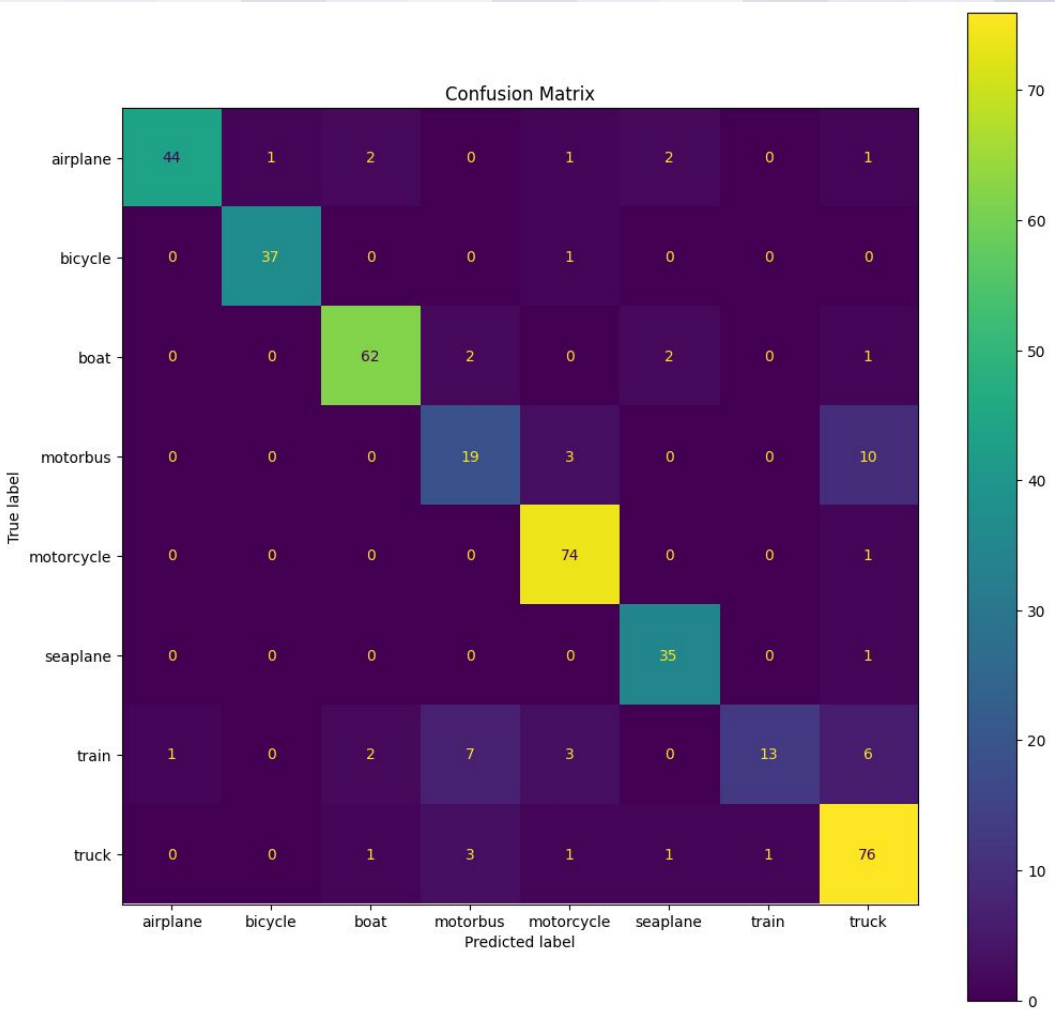
Increase the size of our train data by adding variance to the image by flipping, rotating, and zooming.

3.

MODEL RESULT

MODEL EVALUATION METRIC

| Label | Accuracy | F1-Score |
|------------|----------|----------|
| Airplane | 0.87 | 0.92 |
| Bicycle | | 0.97 |
| Boat | | 0.93 |
| Motorbus | | 0.60 |
| Motorcycle | | 0.94 |
| Seaplane | | 0.92 |
| Train | | 0.57 |
| Truck | | 0.85 |



4.

OVERALL SUMMARY

SUMMARY

- The overall performance of the CNN model is good enough based on the accuracy score of 0.87.
- The model is still weak in classifying Motorbus and Train labels. Both labels only have an f1-score of 0.60 and 0.57.

RECOMMENDATION

- Try using the pre-train model provided by TensorFlow.
- Looking for additional images, especially for labels Motorbus and Train.

THANKS!

Any questions?

For more details on this project, please visit:

<https://github.com/H8-Assignments-Bay/p2---ftds-001-hck--ml2-dimitriasta>