

Deep Learning – Case Study

License plate detector.

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1. Introduction

This case study is designed to detect and recognize number plates. We'll be using Keras for our Convolutional Neural Network model. After Considering the characters one by one, recognizing the characters, concatenating the results and giving out the plate number as a string.

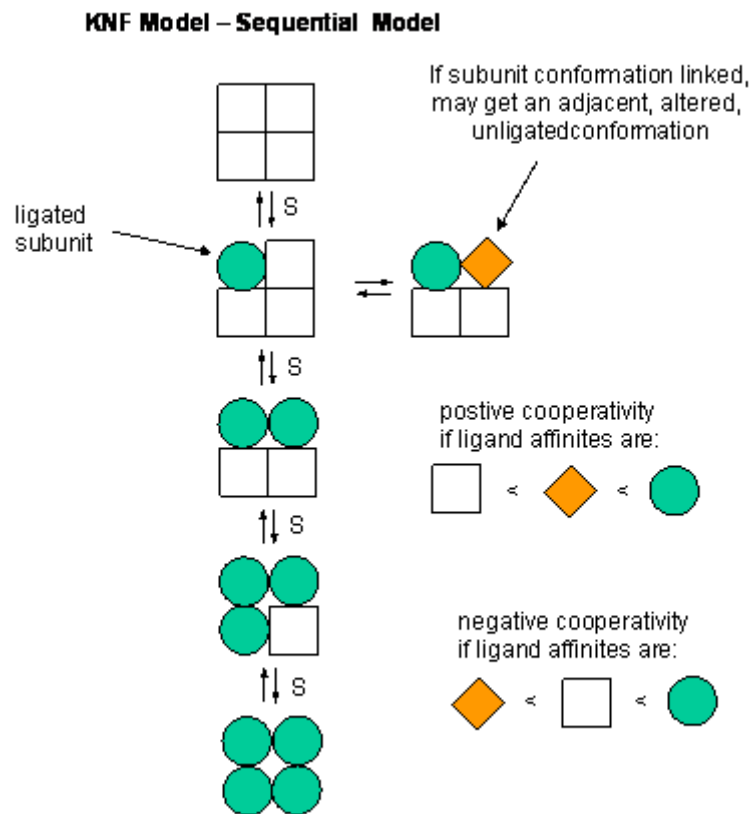
This case study can be used across traffic sectors or the sectors like automatic toll collection. Also, be used to monitor vehicle movement and for access control.

2. Tools and Technologies

Tools and Libraries	Usage
Keras	This library is used for building the network architecture. It allows us to use several layers, callbacks, and InceptionResNetV2 model.
OpenCV	OpenCV is a library of programming functions mainly aimed at real-time computer vision plus its open-source.
Haar cascade	It is a machine learning object detection algorithm used to identify objects in an image or video
Scikit-Learn:	It is a free software machine learning library for the Python programming language.
Kaggle	Used as a platform to execute code as well as manage datasets and model weights

3. Model Explanation and Architecture

A Sequential model is appropriate for a plain stack of layers where each layer has exactly one input tensor and one output tensor.. Hence, to let the network an “idea” about what things to color, we add ResNet.



A Sequential model is not appropriate when:

- Your model has multiple inputs or multiple outputs
- Any of your layers has multiple inputs or multiple outputs
- You need to do layer sharing
- You want non-linear topology

4. Working

It is one of the most accurate applications of computer vision systems. Cameras capture high-speed images of number plates, and software for image processing is used to detect characters, verify the sequence of those characters, and convert the number plate image to text.

Firstly will have to process the image and get the number plate from processed image then find contours in the image then will find characters in the resulting images, after that it preprocess cropped licence plate image then make model for characters then will train the model with the given epochs.

After doing all this we will predict the output with default characters given after that we will see segmented characters and their predicted value

5. Code

<https://github.com/rp003/case-study/blob/main/licence-plate%20recognition.ipynb>

Code and Report is available in the GitHub repository.

6. Output

