

Configuration Manual

MSc Research Project
Data Analytics

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Project Submission Sheet
School of Computing



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Programme:	Data Analytics
Year:	2022
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Configuration Manual

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1 Overview

This is configuration manual of project 'Vehicle Number Plate Detection And Blurring Using Deep Learning'.

2 Hardware and Software Requirements

2.1 Hardware Requirements

The following are the hardware of the system on which research project is build and executed:

- Operating System: Windows 10
- RAM: 8GB
- Processor: Intel(R) Core(TM) i5-4200M CPU @ 2.50GHz 2.50 GHz
- Storage: 1TB

2.2 Software Requirements

Below softwares are used:

- Google Colab
- Python version 3.7
- Google Drive
- YOLO Labelling Tool

3 Environment Setup

Google colab login

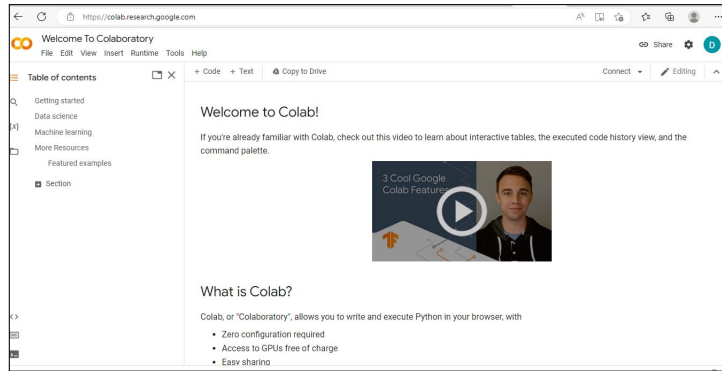


Figure 1: Google Colab

4 DataSet Details

Next step is the downloading of datasets: first dataset used here is from kaggle:
Below is the link:

<https://www.kaggle.com/datasets/andrewmvd/car-plate-detection?resource=download>

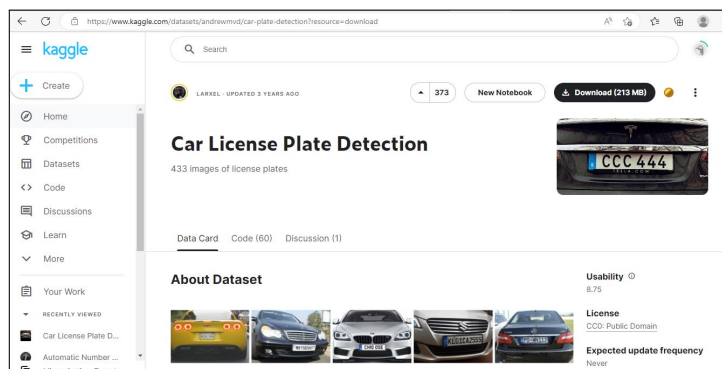


Figure 2: Kaggle Dataset

Second dataset used here is UFPR dataset which is private and google drive link is below:

https://drive.google.com/drive/folders/1RUOXhw6vlyIYWXC0T2L6-qAd5wZDkbs4?usp=share_link

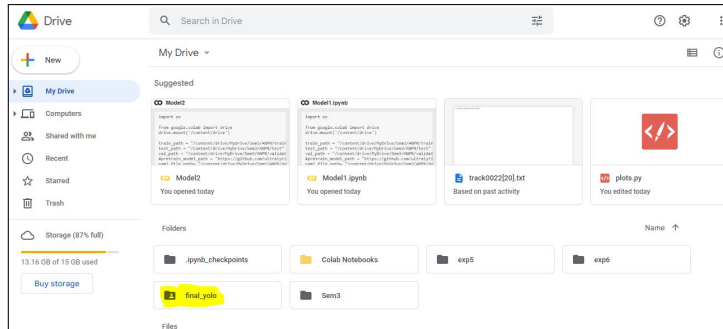


Figure 3: UFPR Dataset Drive

YOLO Labelling Tool:
https://github.com/developer0hye/Yolo_Label/releases/download/v1.1.1/YoloLabel_v1.1.1.zip

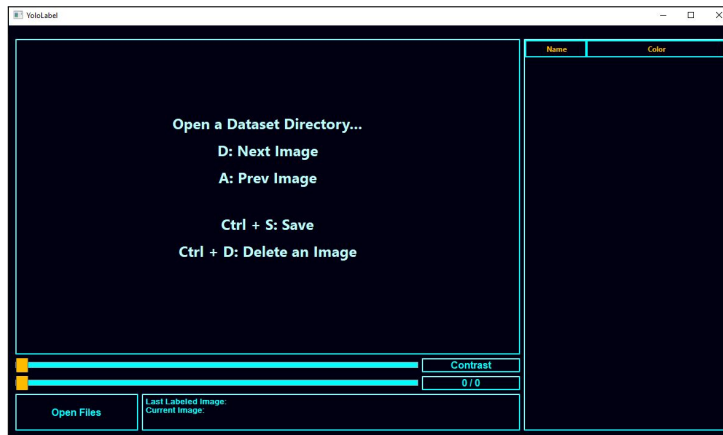


Figure 4: YOLO Labelling Tool

5 Data Transformation and Model Building

After labelling Upload the data on google drive

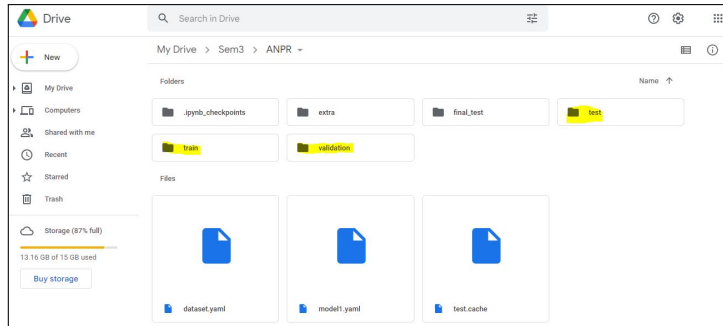


Figure 5: Kaggle Dataset Upload

UFPR Dataset Upload on Google Drive

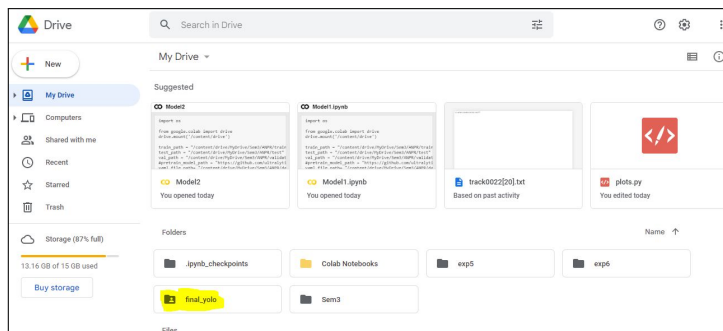


Figure 6: UFPR Dataset Upload

Now in Code Google drive is mounted like below:

```
[ ] from google.colab import drive
drive.mount('/content/drive')
```

Figure 7: Mount Google Drive

Now Download YOLOv5 pretrained model from below link:
<https://github.com/ultralytics/yolov5.git>

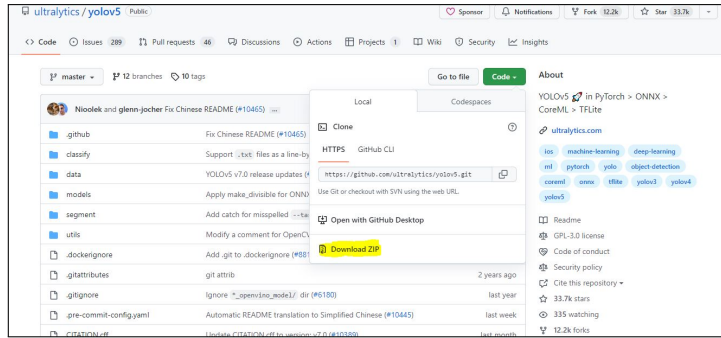


Figure 8: YOLOv5 Pre-trained Model Download

Upload the same on google drive



Figure 9: YOLOv5 Pre-trained Model Upload

Next step is to create the YAML file for both datasets and upload in the google Drive. YAML file is included in the artefact.

6 Code Run

Next step is to run the code Model1 model 2 files.

Change the path wherever required as per Google drive:

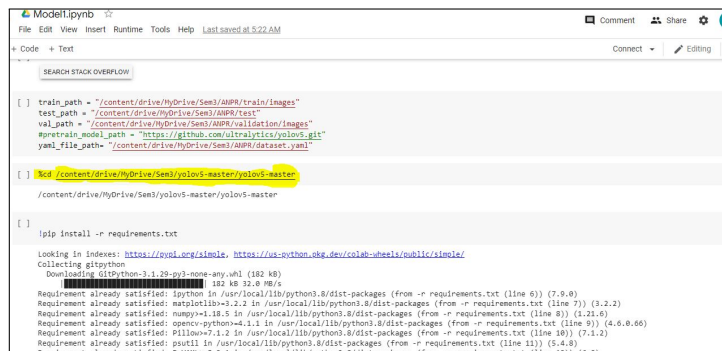
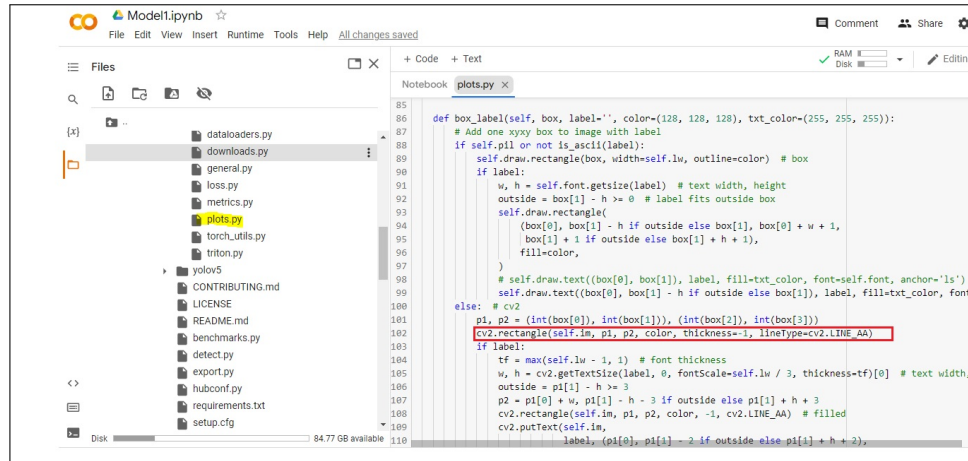


Figure 10: YOLOv5 Pre-trained Model Path

7 Blurring Changes in Existing YOLOv5 Model

In this section we will see how exactly blurring is done to changing the YOLOv5 existing functionality.

For blurring following changes should be done inside the yolov5 pretrained directory.



```
def box_label(self, box, label='', color=(128, 128, 128), txt_color=(255, 255, 255)):
    # Add one xyxy box to image with label
    if self.pl1 or not is_ascii(label):
        self.draw.rectangle(box, width=self.lw, outline=color) # box
        if label:
            w, h = self.font.getsize(label) # text width, height
            outside = box[1] - h >= 0 # label fits outside box
            self.draw.rectangle(
                (box[0], box[1] - h if outside else box[1], box[0] + w + 1,
                 box[1] + 1 if outside else box[1] + h + 1),
                fill=color,
            )
            # self.draw.text((box[0], box[1]), label, fill=txt_color, font=self.font, anchor='ls')
            # self.draw.text((box[0], box[1] - h if outside else box[1]), label, fill=txt_color, font=
    else: # cv2
        p1, p2 = (int(box[0]), int(box[1])), (int(box[2]), int(box[3]))
        cv2.rectangle(self.im, p1, p2, color, thickness=3, lineType=cv2.LINE_AA)
        if label:
            tf = max(self.lw - 1, 1) # font thickness
            w, h = cv2.getTextSize(label, 0, fontScale=self.lw / 3, thickness=tf)[0] # text width,
            outside = p1[1] - h >= 3
            p2 = p1[0] + w, p1[1] - h - 3 if outside else p1[1] + h + 3
            cv2.rectangle(self.im, p1, p2, color, -1, cv2.LINE_AA) # filled
            cv2.putText(self.im,
                label, (p1[0], p1[1] - 2 if outside else p1[1] + h + 2),
```

Figure 11: YOLOv5 changes for Blurring the Number plate

In Plots.py file above changes needed to blur the number plate after detection.

8 Visualization

Visualization can be done after blurring the number plate.

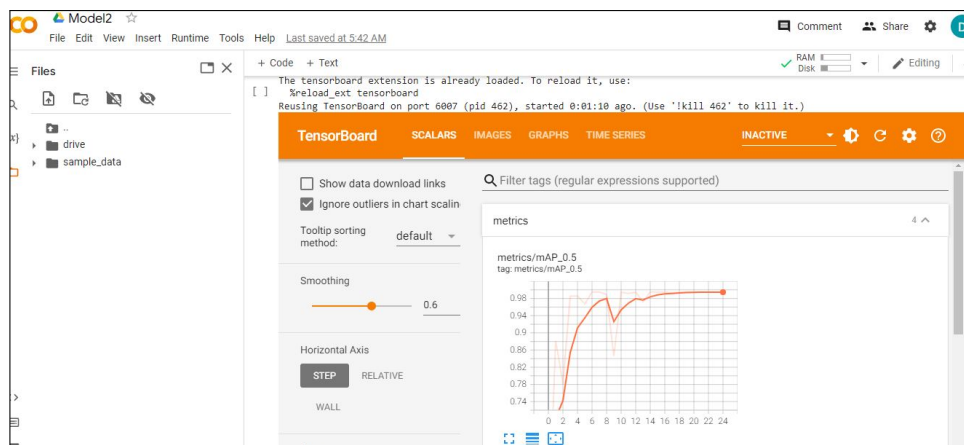


Figure 12: Visualization

Blurring is successfully done on Irish Number plates:



Figure 13: Blurring on Irish Number Plates