Automatic Number Plate Recognition (ANPR)

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Agenda

01. Intro

02. Problem Statement

03. Data Science Process

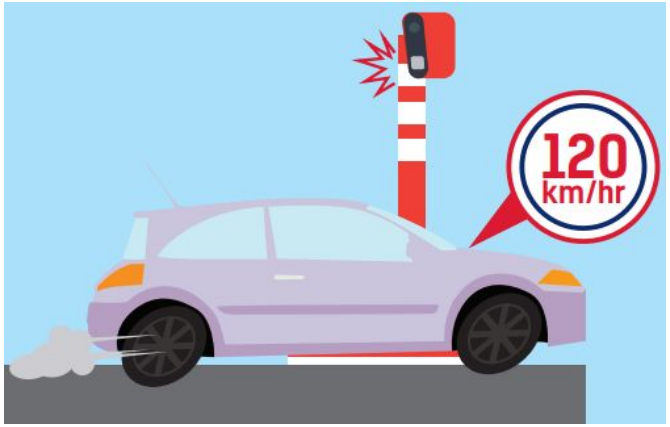
04. Conclusion

05. Next Steps

Year 2020

51,459

Red-light running violations



163,823

Number of Speeding violations

Source: https://www.police.gov.sg/-/media/17E4A7B394524C9190412706F321327D.ashx

On a daily basis

141

Red-light running violations

449

Number of Speeding violations

Source: https://www.police.gov.sg/-/media/17E4A7B394524C9190412706F321327D.ashx

That’s a lot of summons/paperwork

Explore the use cases of ANPR to automate part of the process of enforcing traffic violations

Data Collection (Scraping)

~ 1000

~315

Labelling


ANPR > Annotate
1 / 315
Annotations
Group: License-Plates
License-Plates
300 SEL
EO 3380 J

Pre-processing

1) Base

2) Contrast Adjustment

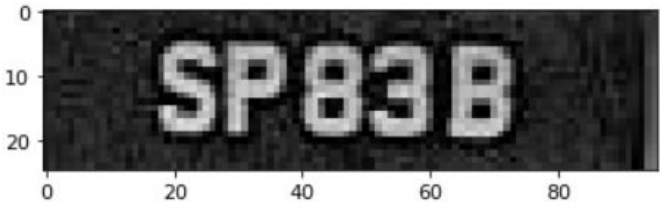
3) Grayscale

4) GS+CA

Modelling

1) Object Detection

YOLOv5



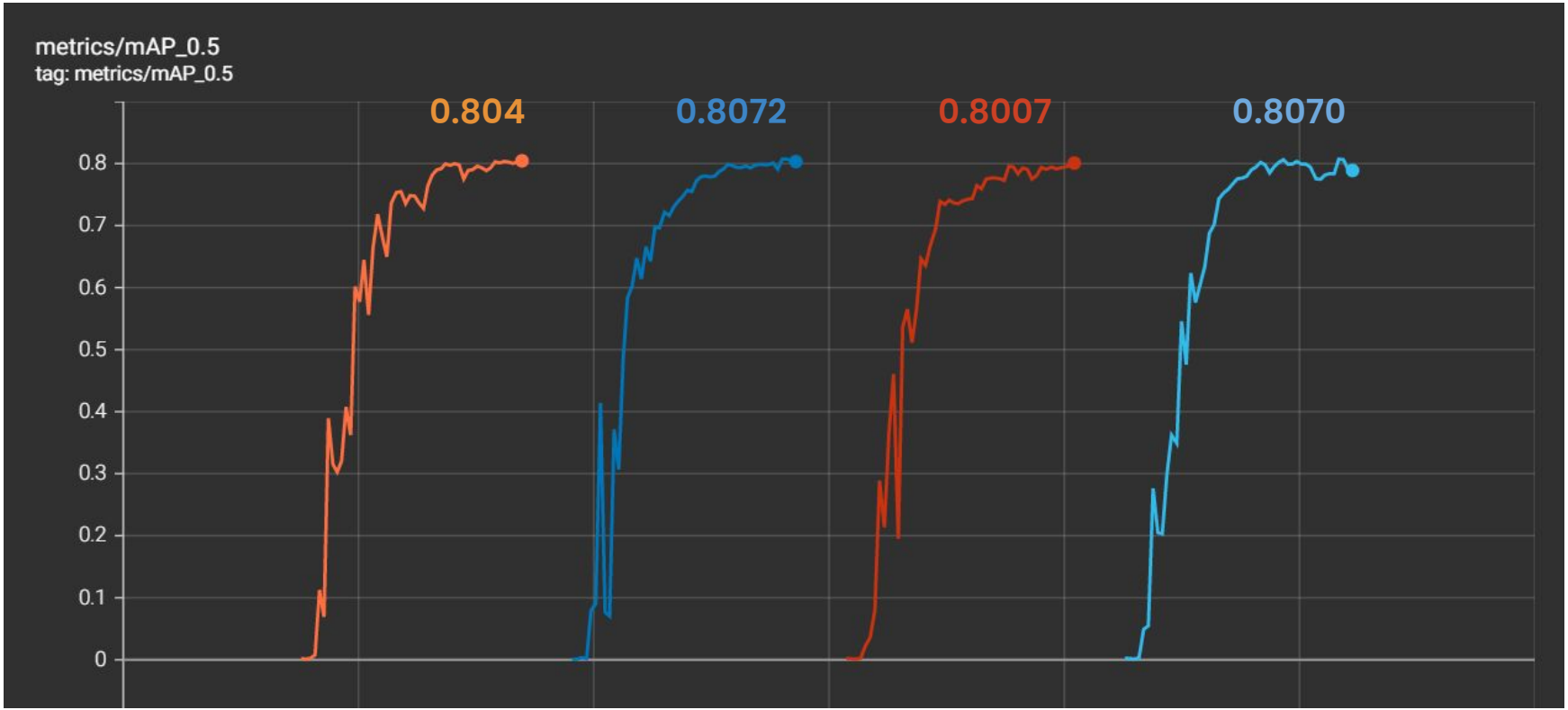
2) Crop License plate

SP83B

3) OCR

Tesseract OCR

Model Inference for Object Detection



Dataset Used	Base	Greyscale	GS+CA	Contrast Adjustment

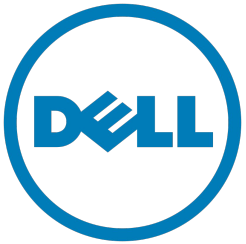
Conclusion

590 violations/images daily

Free-tier GPU

Speed: 0.7ms pre-process, 15.2ms inference

Under ten seconds



Typical office laptop

Speed: 12.0ms pre-process, 454.7ms inference

Just under 5 minutes

Other possible use cases

Enforcing tailgating

(Gantry applications)

Container Identification at ports

Limitations

Lack of quality data

(Scraped 1000, only ~315 had clear number plates in them)

Model not trained with photos taken with IR camera

(Dataset does not accurately reflect photos taken by carpark operators, TP)

Thanks!

Do you have any questions?