

Reckless Road-User Eliminator

Team 10

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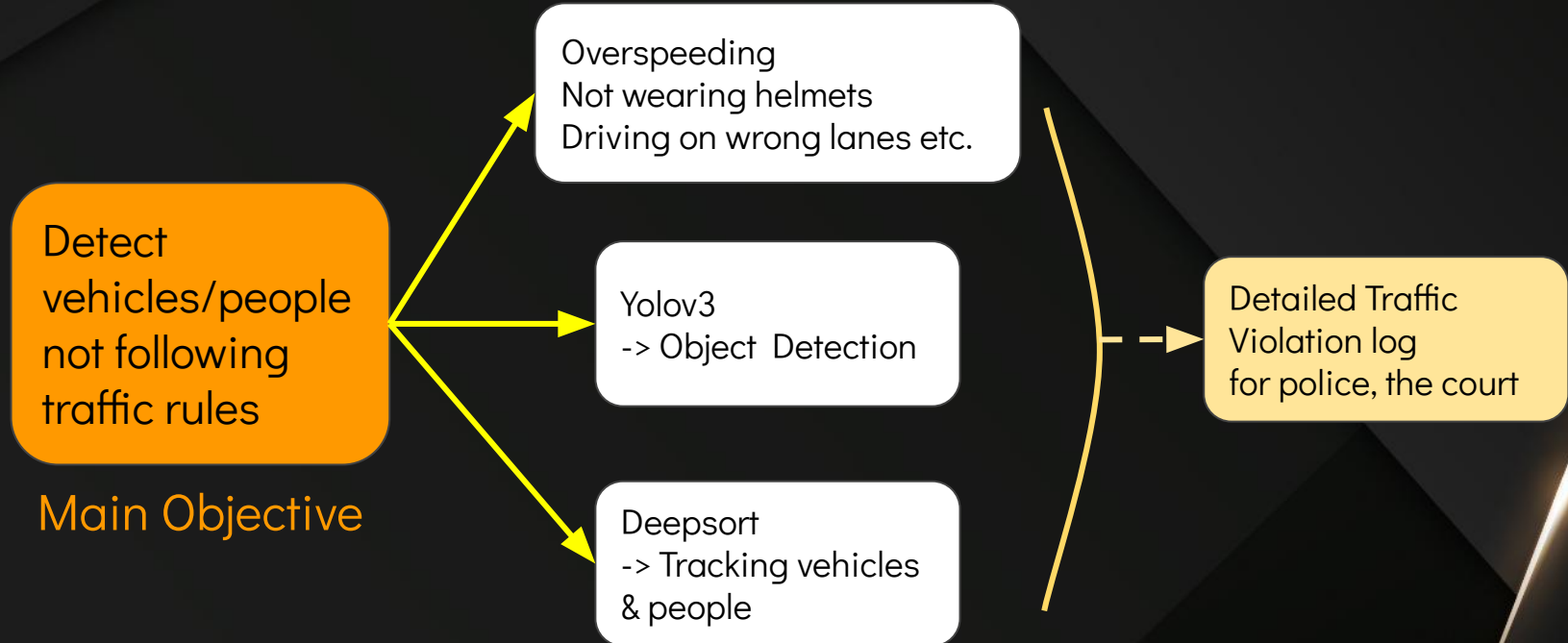
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Problem Statement

Motivation

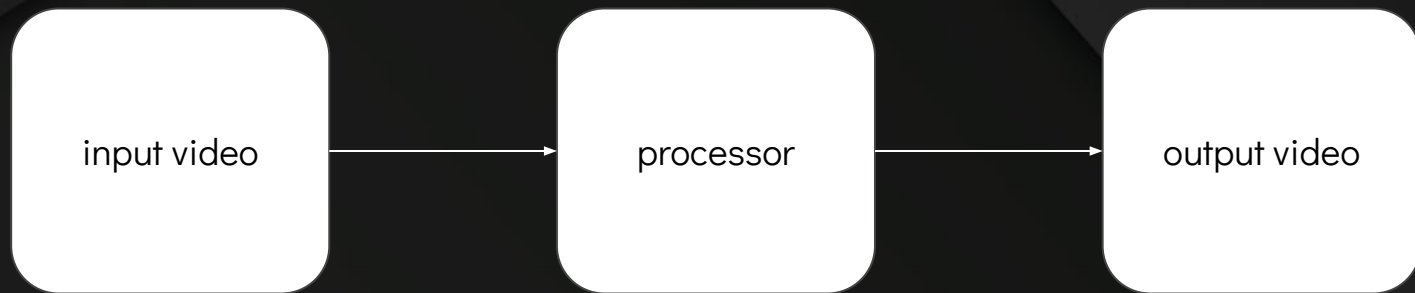
1. Vehicles on the roads are increasing
-> Hard for police to find all traffic-violators
2. Taiwan has been widely considered one of the places having the worst traffic in the world
-> Really bad for our tourism
3. Determining liability in car accidents is difficult sometimes
-> Make the right person pay the price
4. People sometimes are punished without good reason
-> Help traffic-violators know what they exactly do

Our Approach – Computer Vision based solution



System Overview

System overview



System overview: input video

- A video containing **traffic information**



System overview: processor

- A program that analyzes the information in the video and point out those car which are overspeeding and those people who don't put on the helmet.

System overview: output video

- An output video which mobiles that violate the traffic rules are **labeled**.



Main Techniques

Main techniques

YOLOv3 :

Object detection model used to detect helm

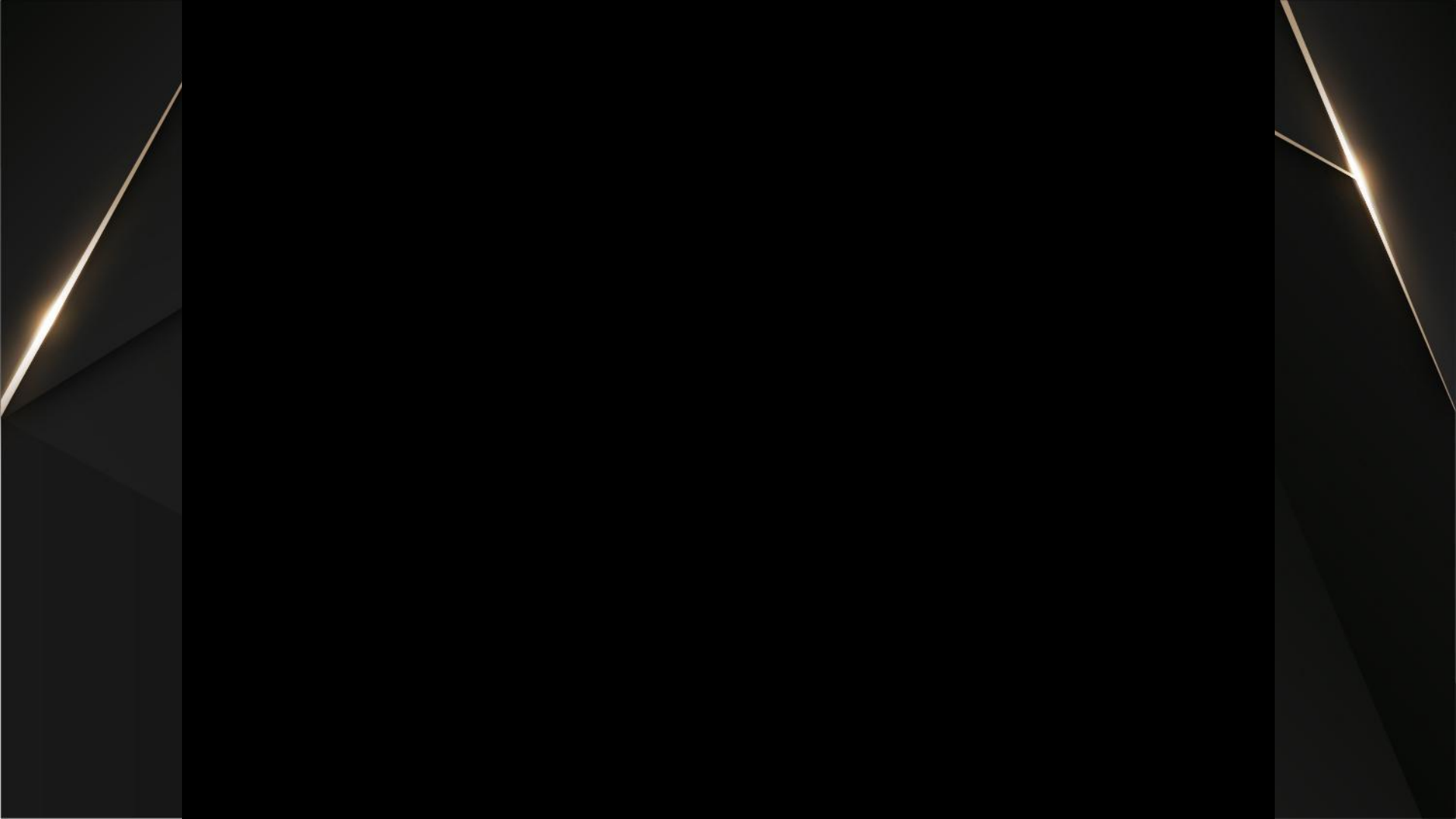
Model is already trained beforehand on helm dataset

Deep SORT

(Simple Online&Realtime Tracking with a Deep Association Metric) :

Multiple Object Tracking (MOT) algorithm for tracking vehicles and pedestrians

Results



FileEditSelectionViewGoRunTerminalHelp

EXPLORER

OPEN EDITORS

all_vehicles.py1speed_check.pyhelm.pyHelmet.py

all_vehicles.py > trackMultipleObjects

result

all_vehicles.py144208209210211212

TRAFFIC RULES VIOLATION DETECTION SYSTEM

Deep learning object de...

all_ve

bikes

cars.s

helm

Helm

motc

myh

obj.n

outp

reco

reco

spee

t.jpg

traffic.mp4

video.mp4

yolov3-obj_2400.weights

yolov3-obj.cfg

229230231232233234235236

PORTS

Remov

Remov

Remov

Remov

Creat

Creat

Remov

Remov

Remov

carID 5 current location.

Creating new tracker 6

Removing carID 4 from list of trackers.

Removing carID 4 previous location.

Removing carID 4 current location.

Removing carID 6 from list of trackers.

Removing carID 6 previous location.

Removing carID 6 current location.


Creating new tracker 7

OUTLINE

TIMELINE

Traffic Rules Violation Detection System

result



LOOKING DB5 2020/03/29 22:00:03

Ln 223, Col 46Tab Size: 4UTF-8CRLFPython3.9.4 64-bit

11:25 PM5/25/2024

Conclusions

Current work

- Can **detect overspeeding** with customed speed limitations (40 km/h limitation applied here)
- Detect those **not wearing a helmet** when riding motorcycles (message'll be appeared near the violator's head)
- Also showing the **speed of those not overspeeding**
-> protect those following the rules

Limitations & Future work

- Limitations:

- Only two traffic rule violation can be detected in our processor so far
- Video resolution affects the performance of helmet detection (Low resolution can lead to inaccurate result more easily)
- Hard to deal with too many vehicles at the same time

- Future work:

- Add other traffic rule detection function.Ex. running a red light, driving in the opposite direction
- Make the system available for people with different hair color
- Make it able to deal with lower resolution videos

The background is a dark, almost black, geometric composition. It features several large, overlapping triangles that create a sense of depth and movement. Two bright, golden-yellow lines cut across the scene diagonally, one from the top-left towards the bottom-right, and another from the top-right towards the bottom-left. These lines have a soft, glowing aura around them, adding a dynamic and modern feel to the overall design.

Thank You !