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الهيئة السعودية للبيانات والذكاء الاصطناعي
Saudi Data & AI Authority

Road Glancing

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Total deaths during the four years 1437-1440

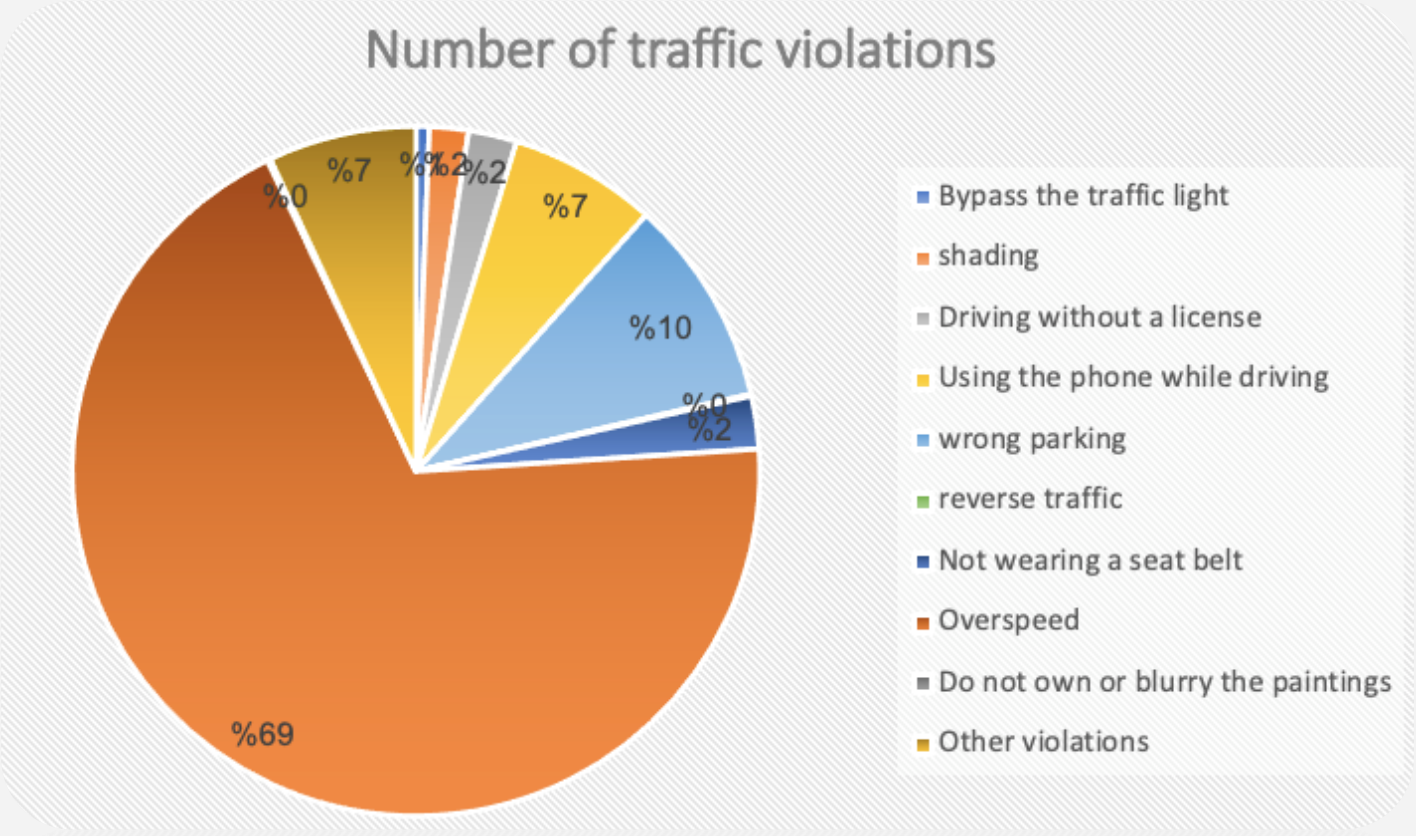
27863 deaths

Total injuries during the years 1437-1440

133175 injuries

statistics

Number of traffic violations in Saudi Arabia by type of violation for the year 2019



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✓ Challenge

Innovative solutions to enhance traffic safety in order to continue raising the level of security and improve the quality of life by taking advantage of the monitoring systems and cameras deployed around the Kingdom.

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✓ Our innovative smart solution and creative idea for Ministry of Interior services

The idea revolves around reporting traffic accidents and strange behaviors to the nearest police station through:

1- Exploiting the cameras on the streets to analyze videos to find accidents and unwanted or strange behaviors.

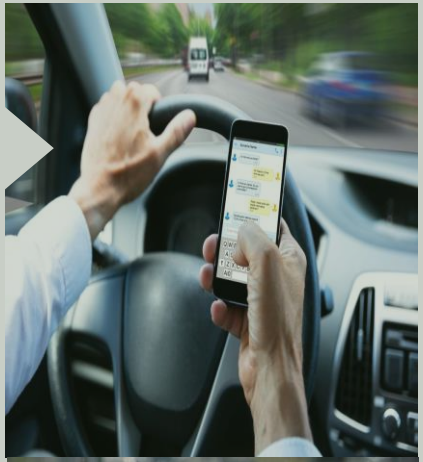
2- Exploiting artificial intelligence to reveal whether there is anything worth pursuing

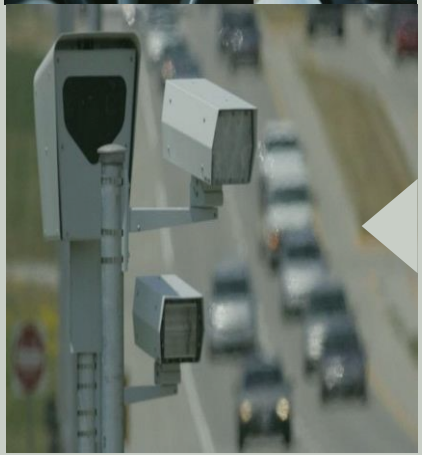
3- Sending a notification to the nearest police station or the nearest police patrol of the place of accident, video and live broadcast of the place

4- Knowing the cause of the accident and who caused it

PROBLEM

Many lives are lost in traffic accidents, and one of the possible reasons is that there is no quick response during the accident.





SOLUTION

- The camera recognizes the accident and sends an alert to the nearest police station
- Driver behavior detection

Data

- Three Dataset

1-Traffic accidents detection
(900 images).

2-Traffic accidents detection
(3100 images).

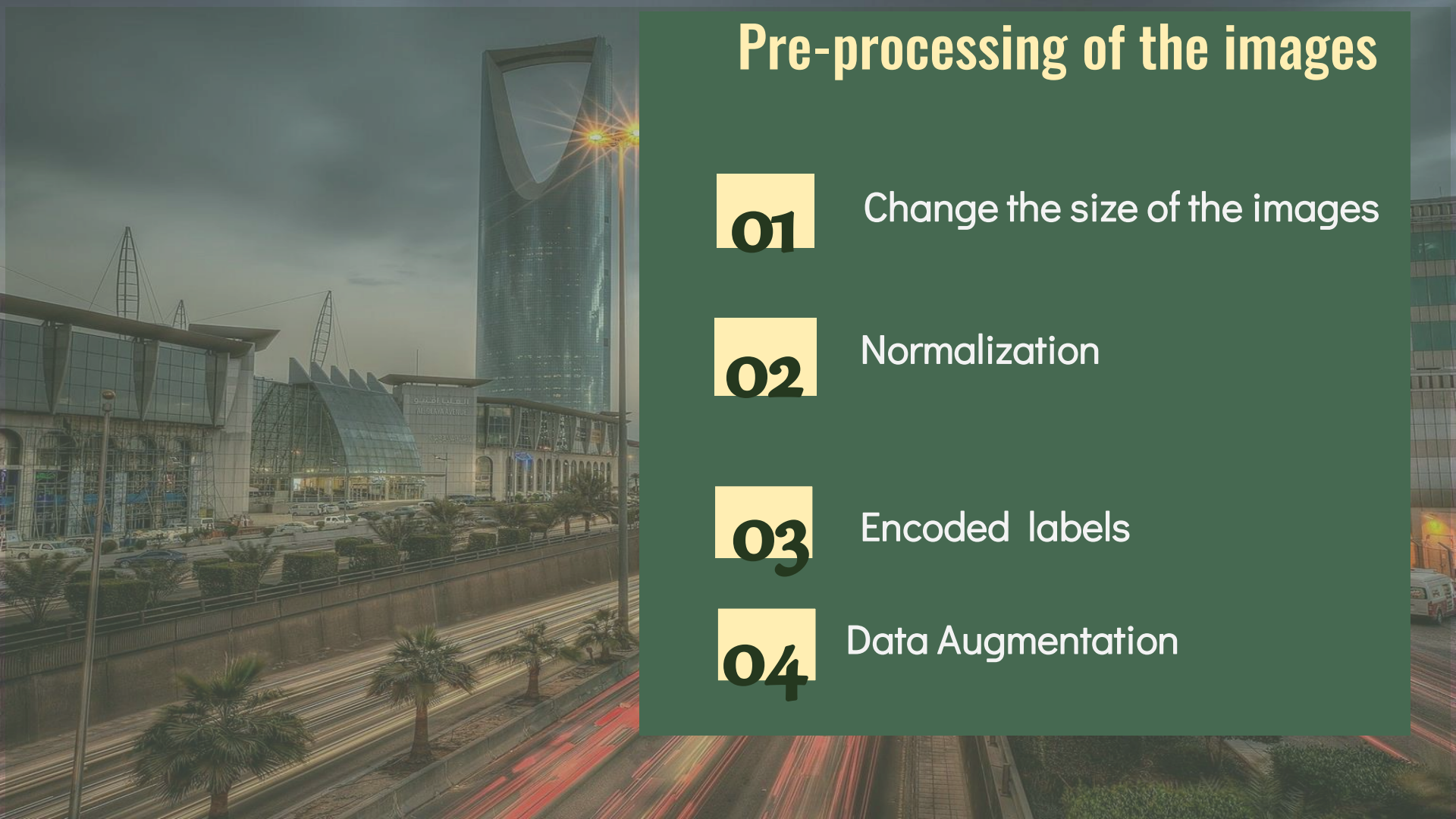
3- Distracted Driver Detection
(22424 images).

1st DataSet - Classes for (Traffic accidents detection)

Accident	No Accident

2nd DataSet - Classes for (Distracted Driver Detection)

Normal	Busy with the radio
Using the mobile with the right hand	eating and drinking
Speaking on the phone with the right ear	looking back
Using the mobile with the left hand	Looking in the mirrors
Talking on the phone with the left ear	Talk to the passenger



Pre-processing of the images

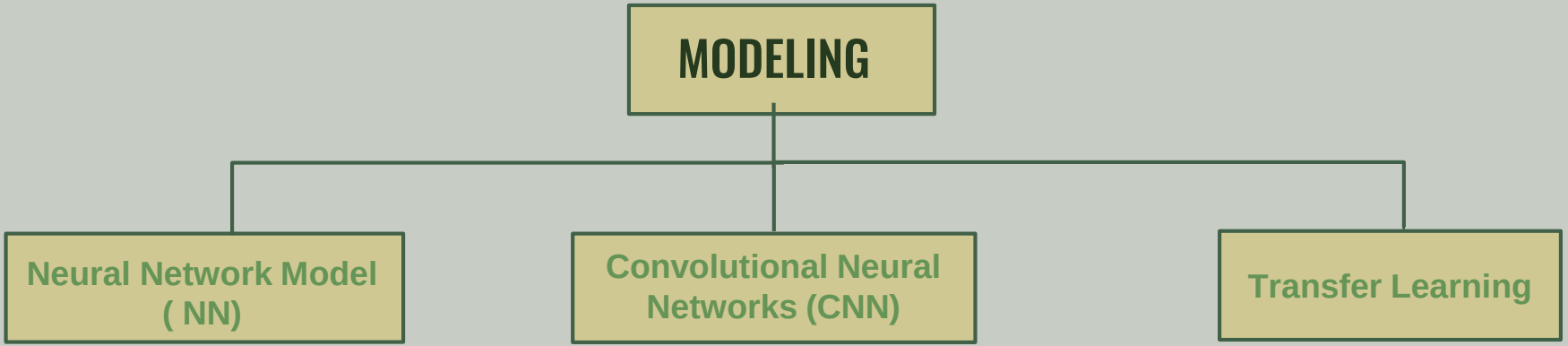
01 Change the size of the images

02 Normalization

03 Encoded labels

04 Data Augmentation

Modeling



1-Traffic accidents detection

2- Distracted Driver Detection

1-Traffic accidents detection

2- Distracted Driver Detection

1-Traffic accidents detection

Best Result For Two DataSet

Traffic accidents detection

The best model is VGG19

	Train	Val
Accuracy	0.97	0.90

Distracted Driver Detection

The best model is CNN

	Train	Val
Accuracy	0.99	0.99

Test Traffic Accident Detection Model

Test The Best Model

```
best_model = NN_transfer_5
```

```
classes = ["Accident","No Accident"]
```

```
img = image.load_img(f"accident.jpg",target_size=(128,128))
img
```

5]:

```
Z = image.img_to_array(img)
Z = np.expand_dims(Z,axis=0)
images = np.vstack([Z])
val = best_model.predict([images])
ind = max(val).argmax()
print(classes[ind])
```

```
Accident
```

Distracted Driver Detection Model

```
img = image.load_img(f"/Users/ajwad/Desktop/sss.jpeg",target_size=(150,150))
img
```

```
Z = image.img_to_array(img)
Z = np.expand_dims(Z,axis=0)
images = np.vstack([Z])
val = MyCnn.predict([images])
ind = max(val).argmax()
print(classes[ind])
```

```
7
```

7= Look Back

Conclusion

After using many models, we achieved the best result for the test:

1-Traffic accidents detection
Test : 0.90

2- Distracted Driver Detection
Test : 0.98

FUTURE WORK

Accelerate the inspection process for traffic accidents through the use of drones and artificial intelligence techniques.

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THANK YOU