

The background is a dark blue gradient. On the left, there is a large, stylized graphic consisting of a blue parallelogram and a green parallelogram. Below these, a circular inset shows a close-up of a circuit board with various electronic components. In the top right corner, there is a 3D perspective view of a circuit board layout.

Face Detection Using Convolutional Neural Network

Janaki Purushothaman

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Overview



- This project focuses on building a deep neural network for detecting real or fake faces.
- With GAN its become easy to generate fake faces and its challenging in today's world to identify those identity theft.
- It's necessary to build a effective model for better performance

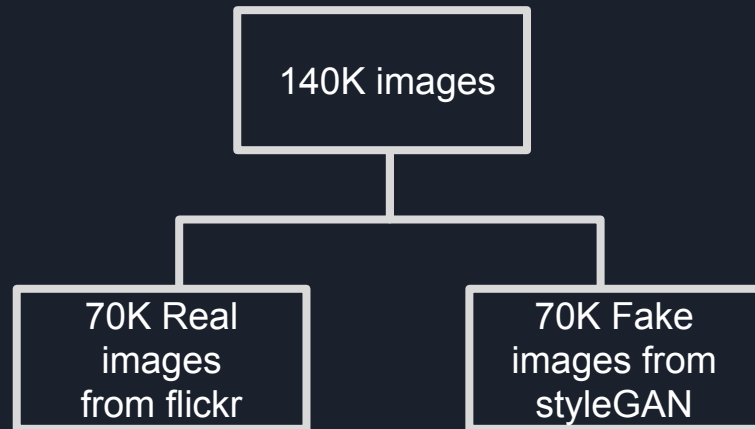
Understanding the problems



- Cybercrime is the most known issue.
- Biometrics face recognition is emerging
- A leading corporate company who develops software for The United States Department of Homeland Security wants to build a face recognition model to be used by border patrols.

Data

- The Dataset used is from kaggle
- It consist of 70K real faces from the Flickr collected by Nvidia and 70 K fake faces generated by styleGAN collected by Bojan



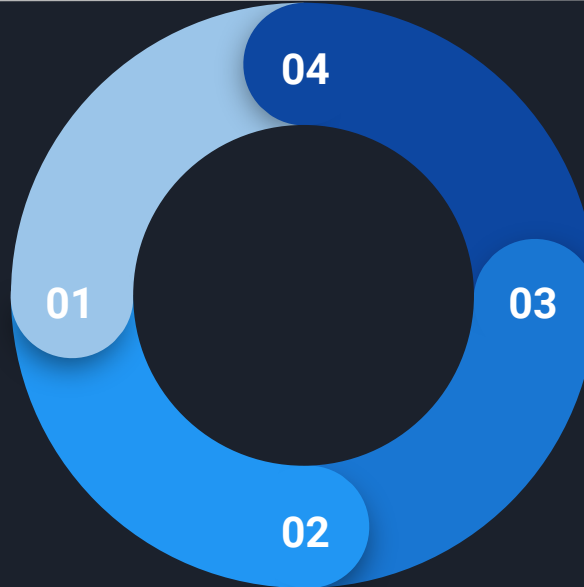
Methodology

Data collection

Images are collected and resized to necessary format

Data Exploration

Visualization of images to check the image details



Interpretation

Interpreting the result based on the metrics

Modelling

Feeding the images into the neural network for modelling

ANALYSIS

- Comparison of images which are real and fake.
- All the images were downsized to 128X128 pixels and RGB color channels.

FAKE

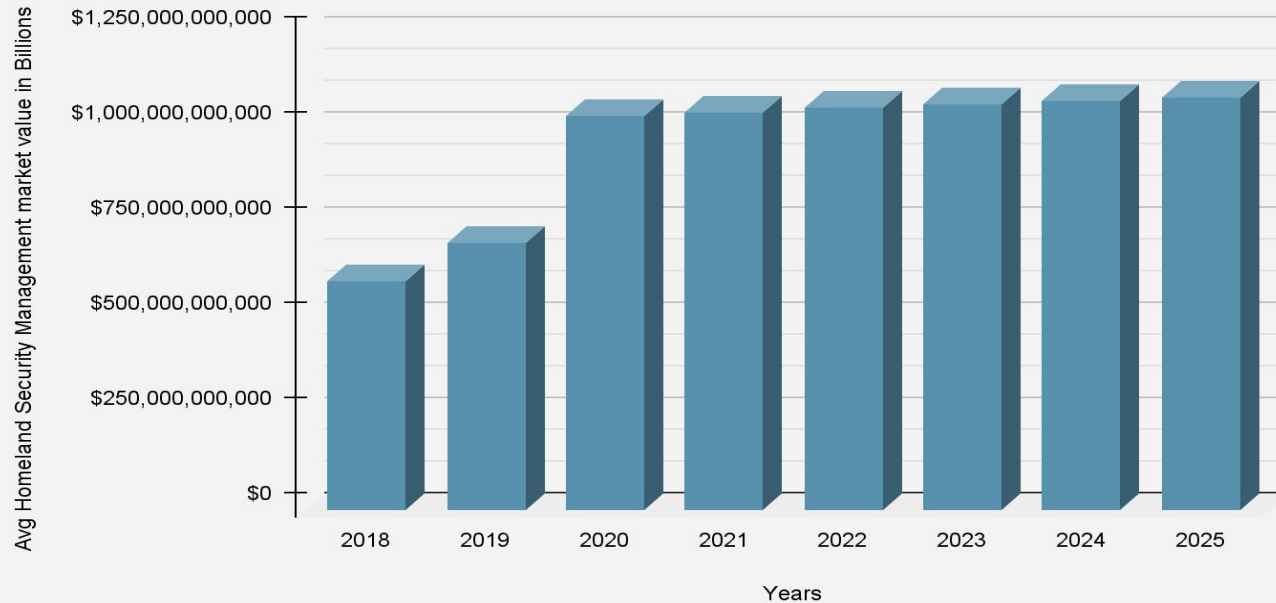


REAL



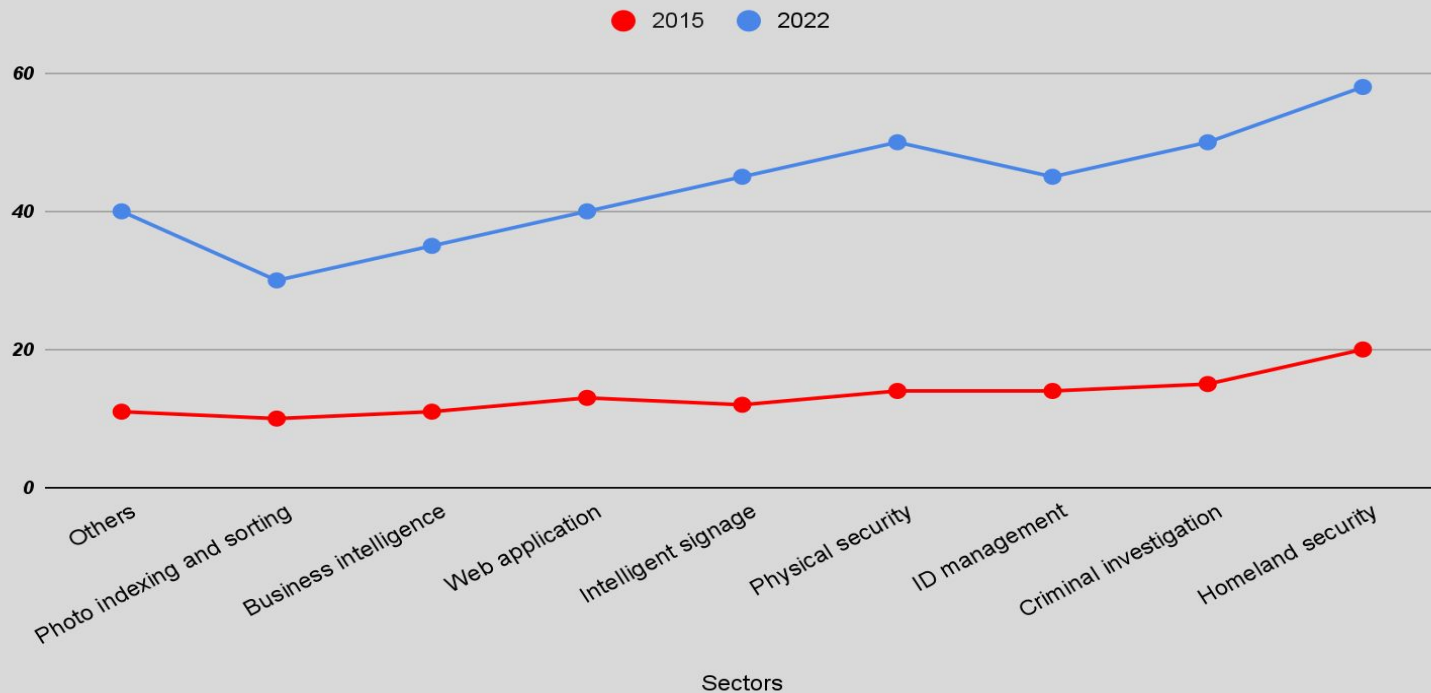
Market trends

Covid-19 impact on Homeland security Management Market



Homeland Security sector holds the dominant position

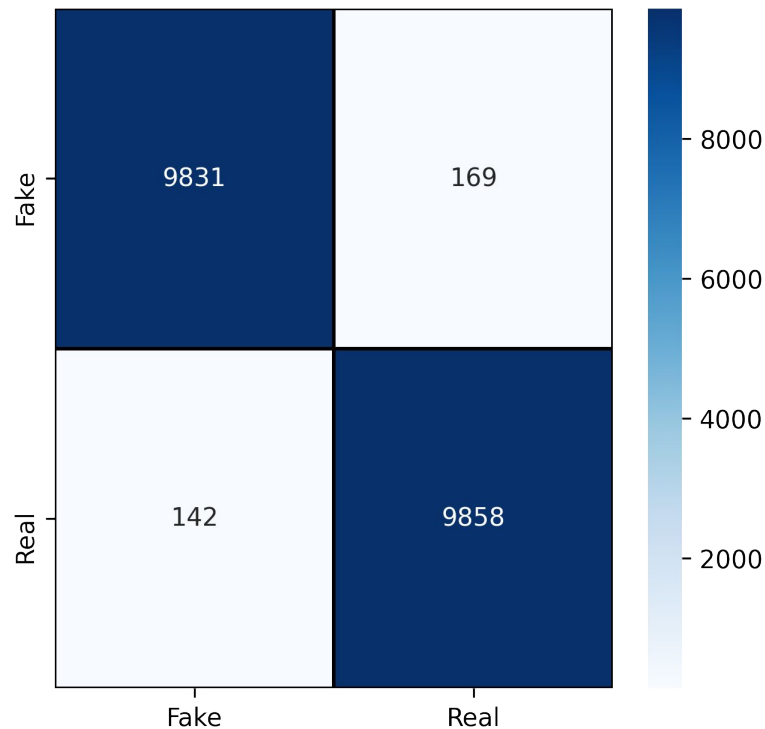
Global Facial Recognition Market by Application



Model Result

Accuracy rate of the final model
from 5 different model built: 98%

True Positive: 9858
True Negative: 9831
False Positive: 169
False Negative: 142

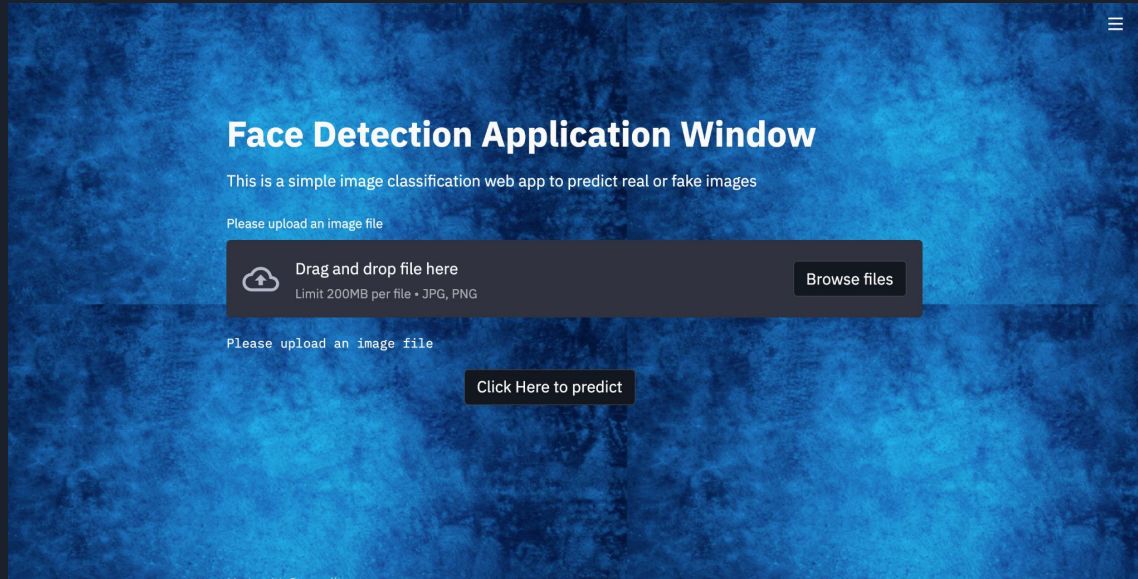


Field of Application

- Unlock phones
- Identify people on social media
- Aid forensic investigations
- Protect law enforcement
- Air Travel
- Control access to sensitive areas
- Fast and non-invasive identity verification



Streamlit Application



Step 1 : upload image

Step 2: Click on predict button

Step 3: App tells if it is REAL or FAKE image



Conclusion

- High accuracy rate of the model
- Model works best for image classification
- The prediction rate was higher than other built models.

Next Step



- Masked face detection
- Data collection from The Homeland Security team
- Adding more complex structure
- Reducing the false cases



Thank you!



Any questions?

You can find me at

janakipurushothamman@gmail.com