Team Details

Team Name: System Zombies
Team Leader Name: Ashish Darekar
Problem Statement: Face Mask Detection

Brief About the Prototype

Face mask detection refers to detect whether a person is wearing a mask or not. In fact, the problem is reverse engineering of face detection where the face is detected using different machine learning algorithms for the purpose of security, authentication and surveillance.
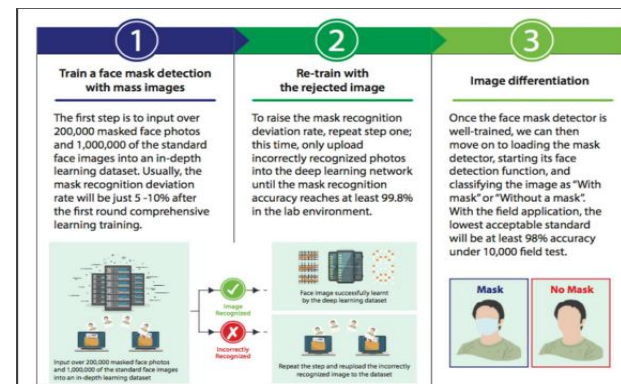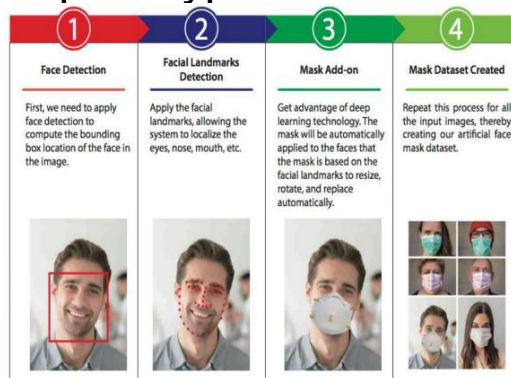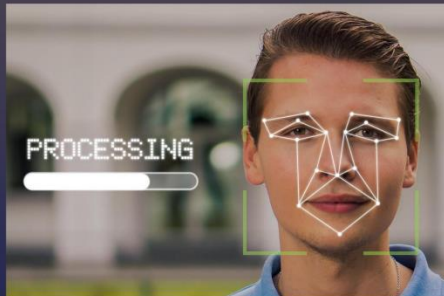
Here is my face mask detector Project which is selected for the Smart India Hackathon 2022 as Grand Finalist and Team Leader of the Smart India Hackathon Team I represented my team at Chandigarh Punjab Mohali
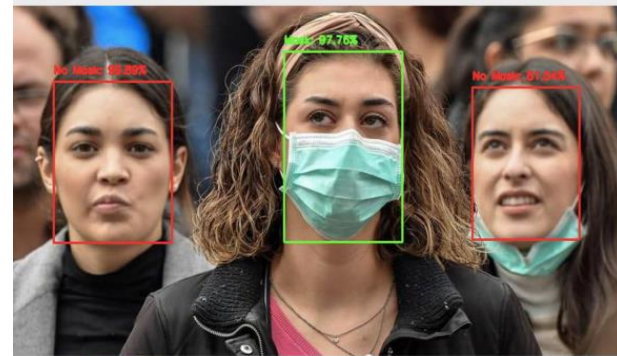
Opportunities

- **How different is it from any of the other existing ideas?**
- *The Face Mask Detection System can be used at office premises to detect if employees are maintaining safety standards at work. It monitors employees without masks and sends them a reminder to wear a mask.*
- **How will it be able to solve the problem?** □
- *Face detection algorithms typically start by searching for human eyes — one of the easiest features to detect. The algorithm might then attempt to detect eyebrows, the mouth, nose, nostrils and the iris. The methods use in face detection can be knowledge-base, featurebase, template matching or appearance-based.*

- **USP of the proposed solution**
- *Face mask detection refers to detect whether a person is wearing a mask or not. In fact, the problem is reverse engineering of face detection where the face is detected using different machine learning algorithms for the purpose of security, authentication and surveillance*

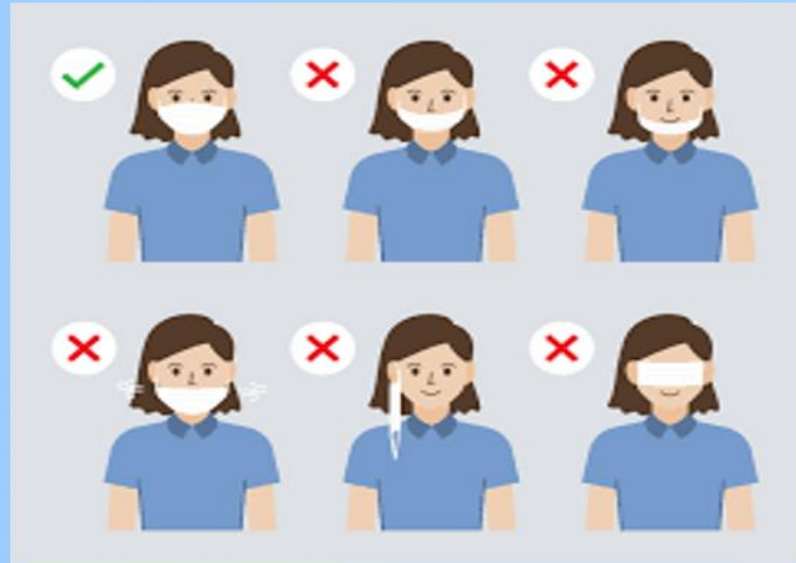# List of features offered by the prototype

Face Detection Algo.
PROCESSING

1 Face Detection
First, we need to apply face detection to compute the bounding box location of the face in the image.

2 Facial Landmarks Detection
Apply the facial landmarks, allowing the system to localize the eyes, nose, mouth, etc.

3 Mask Add-on
Get advantage of deep learning technology. The mask will be automatically applied to the faces that the mask is based on the facial landmarks to resize, rotate, and replace automatically.

4 Mask Dataset Created
Repeat this process for all the input images, thereby creating our artificial face mask dataset.

1 Train a face mask detection with mass images
The first step is to input over 200,000 masked face photos and 1,000,000 of the standard face images into an in-depth learning dataset. Usually, the mask recognition deviation rate will be just 5 -10% after the first round comprehensive learning training.

2 Re-train with the rejected image
To raise the mask recognition deviation rate, repeat step one; this time, only upload incorrectly recognized photos into the deep learning network until the mask recognition accuracy reaches at least 99.8% in the lab environment.

3 Image differentiation
Once the face mask detector is well-trained, we can then move on to loading the mask detector, starting its face detection function, and classifying the image as "With mask" or "Without a mask". With the field application, the lowest acceptable standard will be at least 98% accuracy under 10,000 field test.

Reverse Face Detection Algo.

Use any camera to analyze faces

Detect faces with and without masks

Get notifications for new detections

Remind visitors to wear a mask

Thank visitors for wearing a mask

TECHNOLOGIES USED

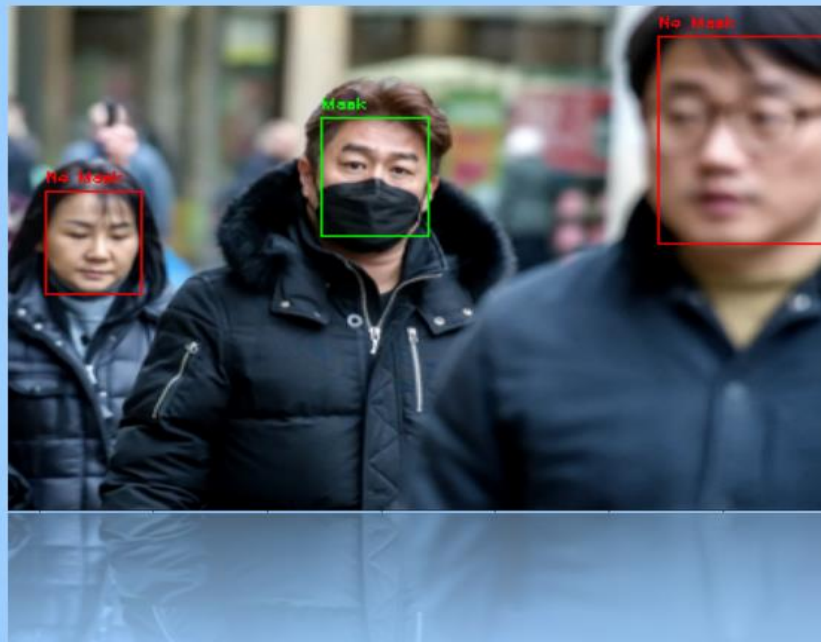## *Wireframes/Mock diagrams of the proposed solution*

Architecture diagram of the proposed solution

DETECTING FACE MASK IN THE GROUP

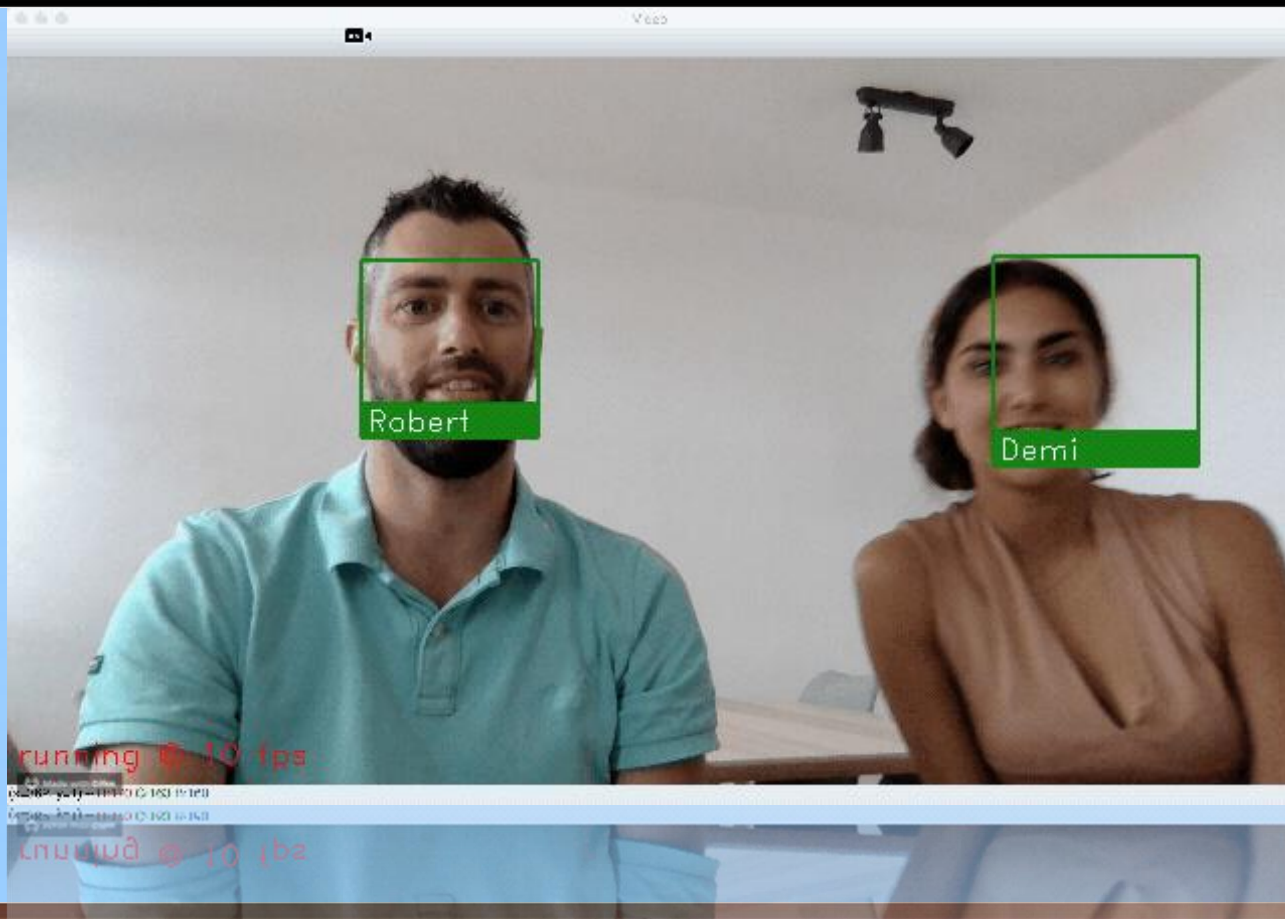# _Technologies to be used in the solution_

➢ **PYTHON OPEN CV**

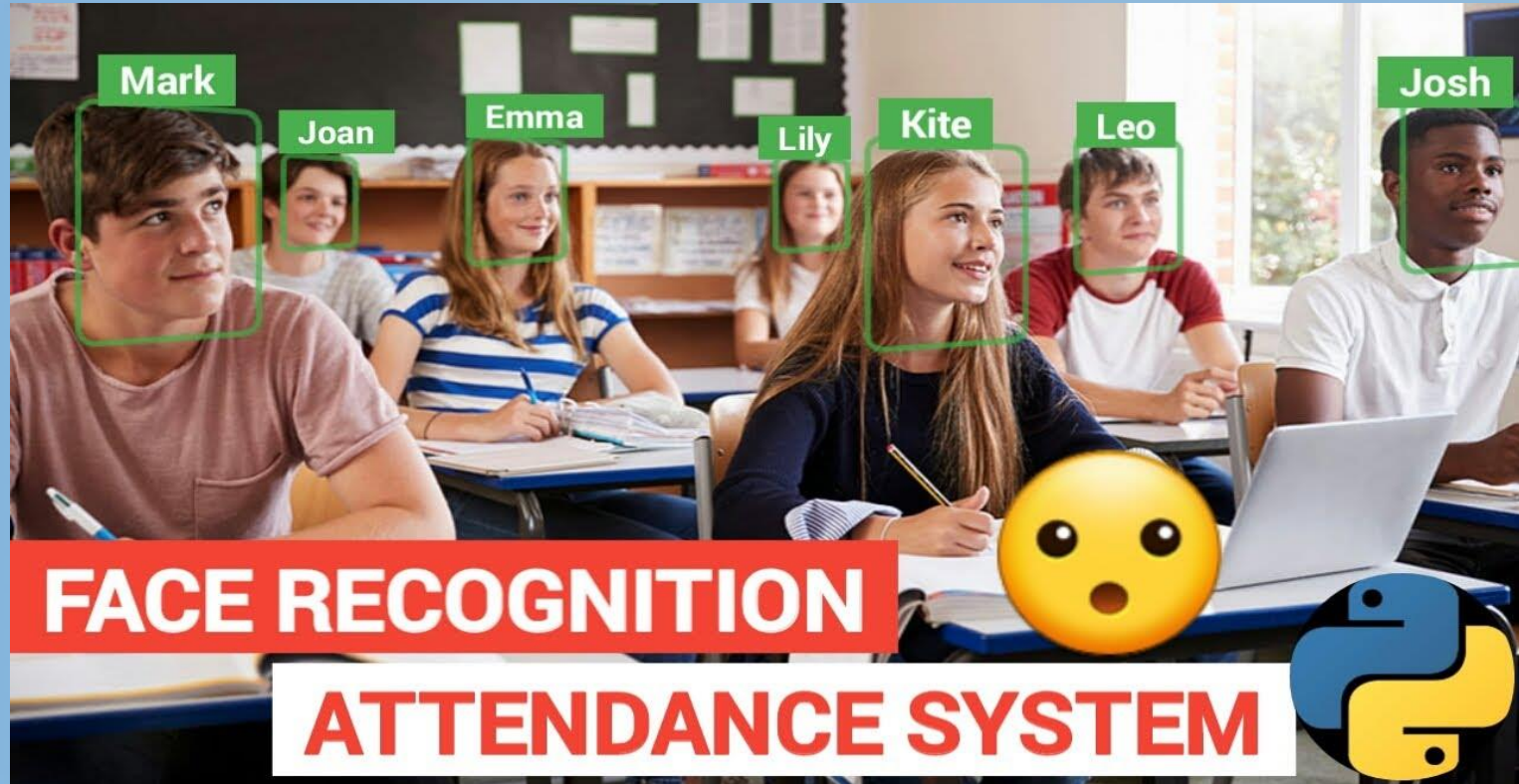➢ **DEEP LEARNING**

➢ **ARTIFICIAL INTELLIGENCE**

➢ **MYSQL DATABASE**

TEMPERATURE SENSING USING ARDUINO

FACE RECOGNITION ATTENDANCE SYSTEM

THE/NUDGE
INSTITUTE
Google

Hack4Change
@chorcha

Powered By H2S

Additional Details/Future Developments (if any):
https://youtube.com/shorts/OlpHHuXaUq8?si=uTESjYMCNvi7X1DL

Prototype Resources:

1. GitHub Public Repository Link:
https://github.com/Ashish-thehacker/FACE-MASK-DETECTION

2. Demo Video Link (3 Minutes):
https://youtu.be/updwoshm5Yg?si=5X1jXSR0pZrsDEc7
https://youtu.be/sw3QQ1DoRQM?si=OiAROfWHIJ4kBqiy

3. Final Product Link:
https://github.com/Ashish-thehacker/FACE-MASK-DETECTION/blob/main/main.py

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