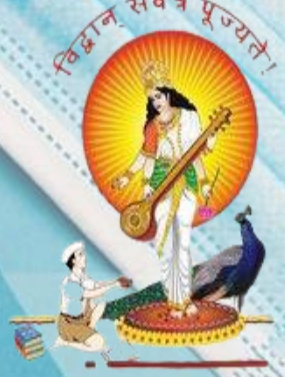

Pune Vidyarthi Griha's

College of Engineering & SSD IOM, Nashik

Project on

"Face Mask Detection System Using AI"

Presented by

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Introduction

- The 209th report of the world health organization (WHO) published on 16th August 2020 reported that coronavirus disease ,And coronavirus spread by avoiding forward distance travelled by a person's exhaled breath by more than 90%.

- 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.

- Face detection is a key area in the field of Computer Vision and Pattern Recognition. A significant body of research has contributed sophisticated to algorithms for face detection in past.

Problem Statement

Wearing a mask in public settings is an effective way to keep the communities safe as a response to the covid-19 pandemic, We open-sourced a face mask detection application that uses AI detect if people are wearing masks or not. Focused on making our face mask detector ready for real-world applications, such as CCTV cameras, where faces are small, blurry, and far from the camera.

Literature Survey

The followed part, we briefly present the existing related works on classification and tracking of face mask.

There are several approaches are used for facial masks detection. For instance, used electromagnetic and radiometry techniques for facial masks detection. employed deep neural networks (ANN) using machine learning techniques in Facial Masks detection. Also comparison was made between ELM ANN and BP ANN based on performance measurements .

System Architecture

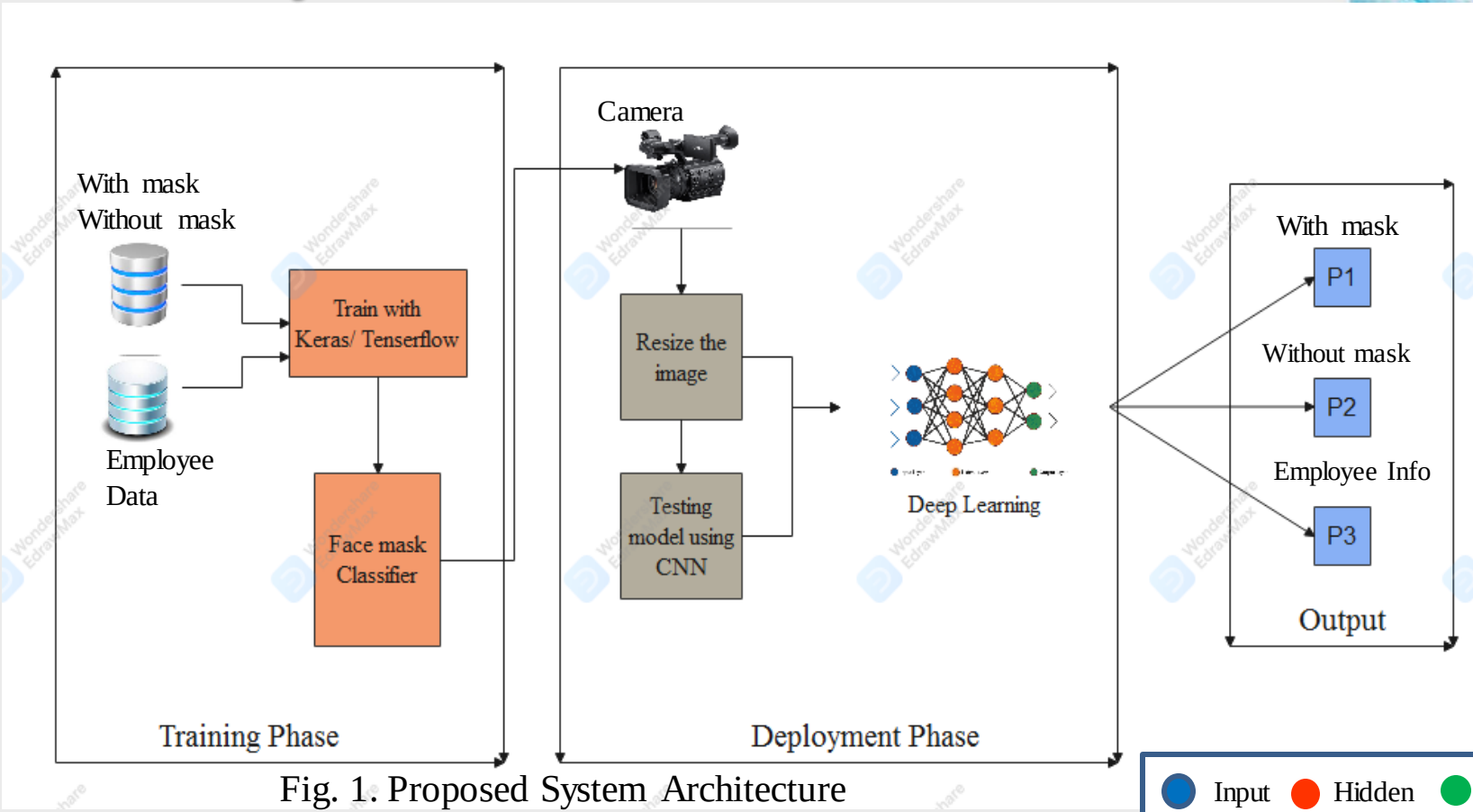


Fig. 1. Proposed System Architecture

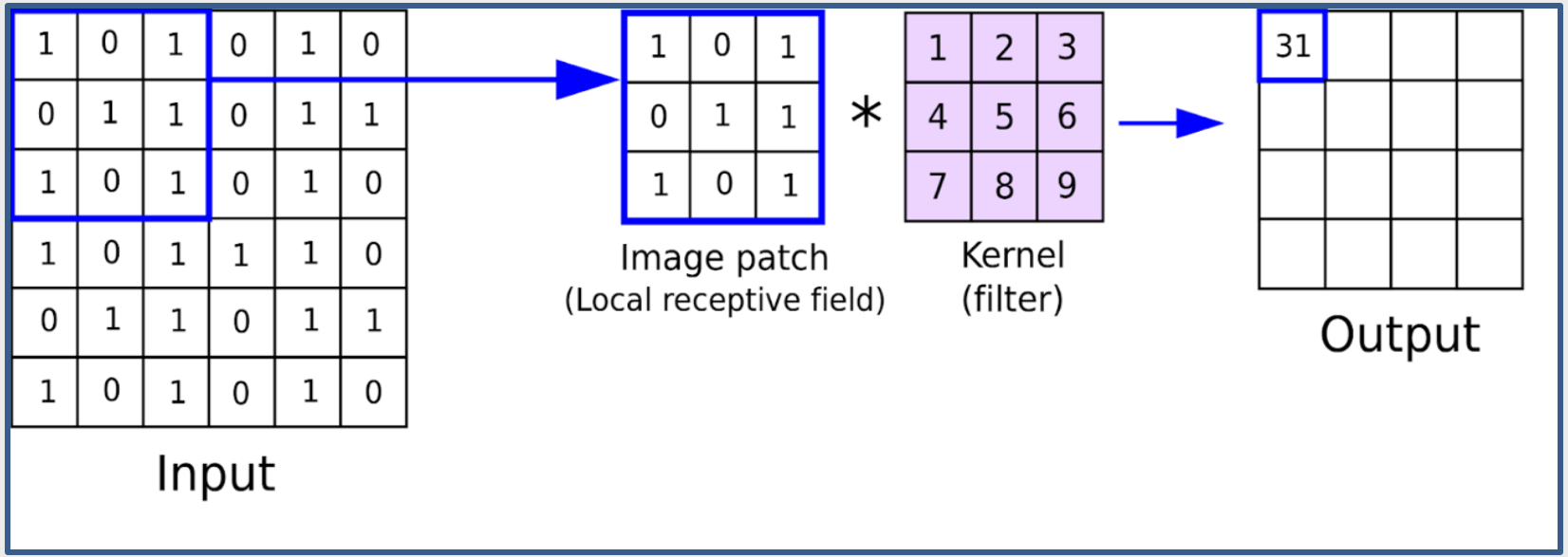
Modules

1. Mask Detection
2. Face Detection
3. Email Alert

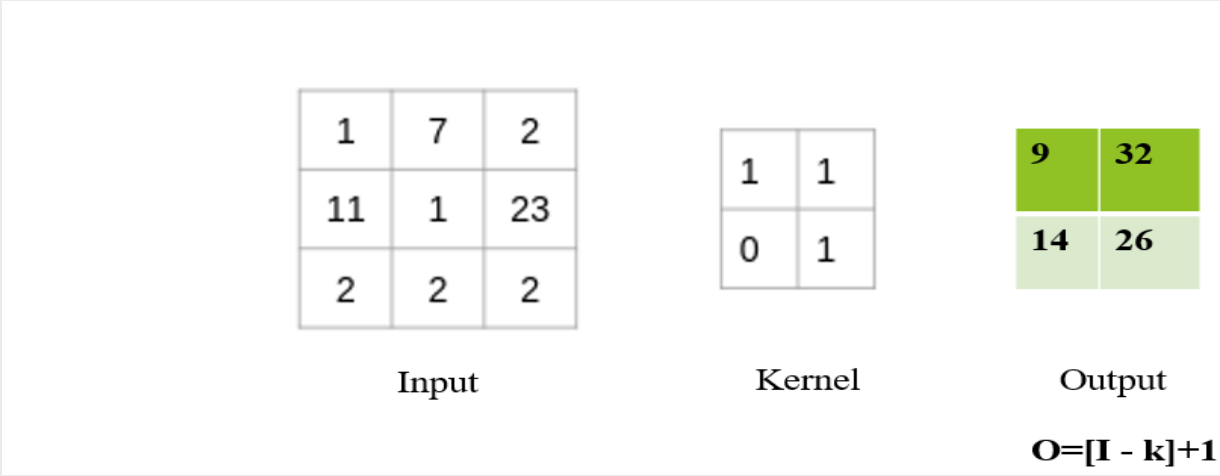
Algorithm

1. **CNN (**Convolutional Neural Network**):**
   - Convolution Operation
   - ReLU Layer
   - Pooling
   - Flattening
   - Full Connection

Convolution



Pooling



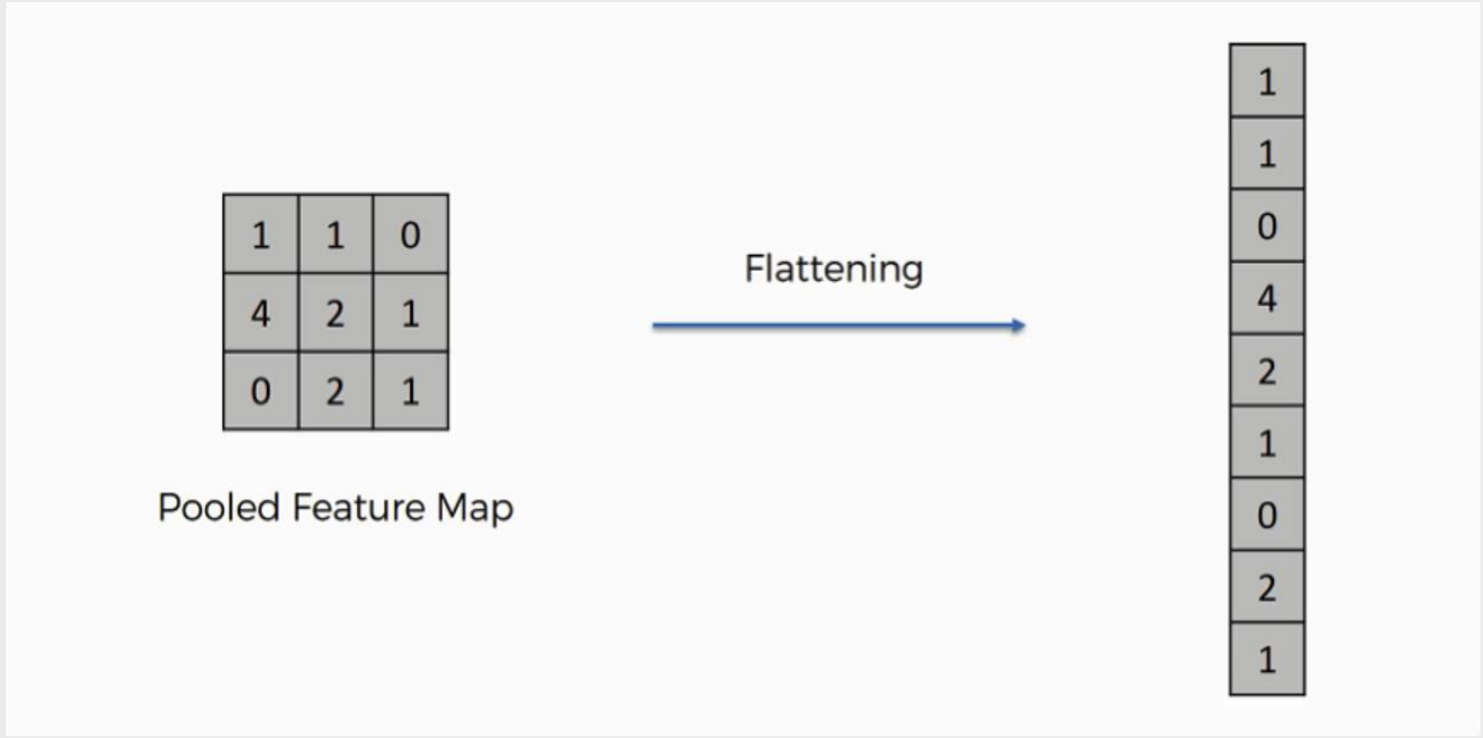
(1x1 + 7x1 + 11x0 + 1x1) = 9

(7x1 + 2x1 + 1x0 + 23x1) = 32

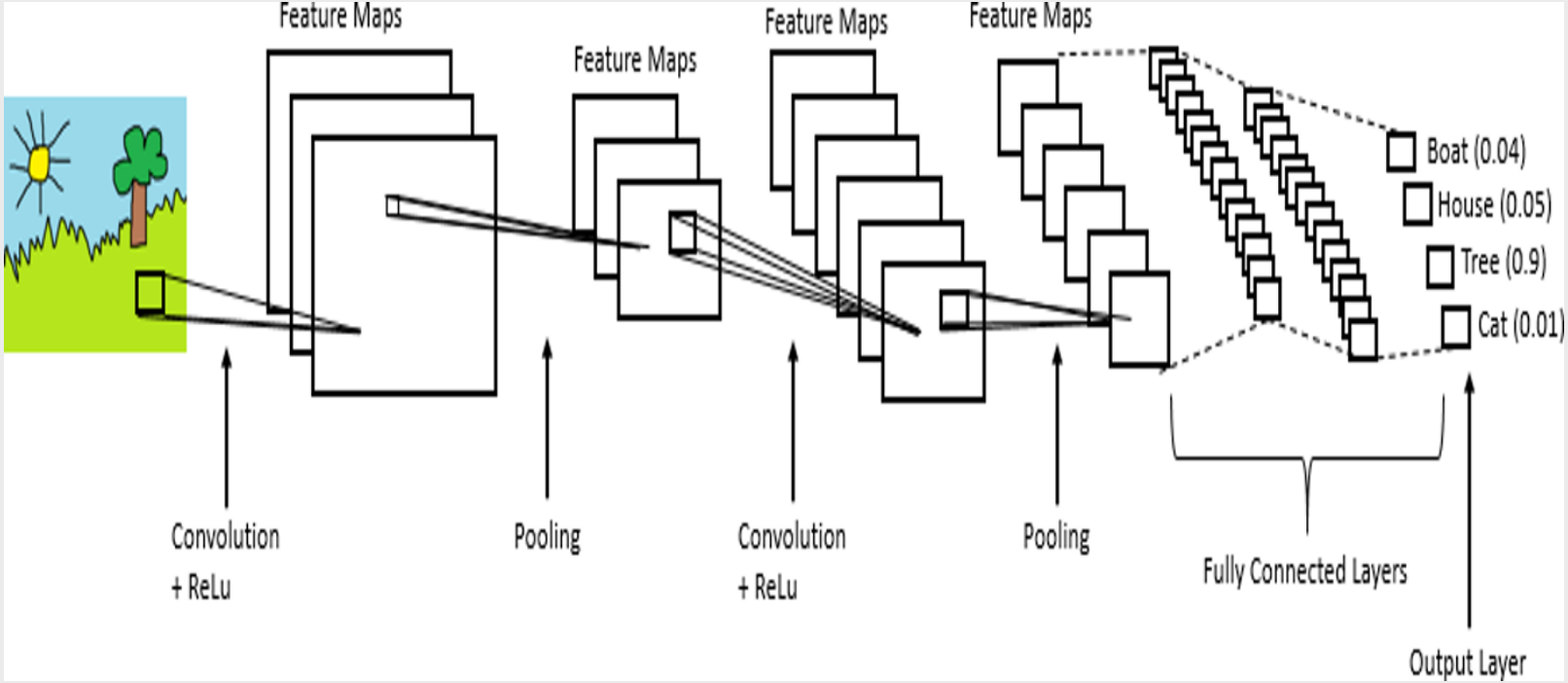
(11x1 + 1x1 + 2x0 + 2x1) = 14

(1x1 + 23x1 + 2x0 + 2x1) = 26

Flattening



Basic working of CNN



Technologies

Artificial Intelligence

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert system, natural language processing, speech recognition and machine vision

Deep Learning

The field of artificial intelligence is essentially when machines can do tasks that typically require human intelligence. It encompasses machine learning, where machines can learn by experience and acquire skills without human involvement.

Advantages

- Cost effective.
- Curb Covid-19 Pandemic.
- Mostly used in public places like Hospitals etc.
- The system is easy to implement in any existing organizational system.
- The system can be used easily with any camera or hardware like surveillance area.
- Life Saving.

Future Scope

Finally, the work opens interesting future directions for researchers. Firstly, the proposed technique can be integrated into any high-resolution video surveillance devices and not limited to mask detection only. Secondly, the model can be extended to detect facial landmarks with a facemask for biometric purposes.

Conclusion

With the help of this proposed system, we are able to contribute in public healthcare and welfare. Using basic ML tools and simplified techniques the method has achieved reasonably high accuracy.

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