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Human Detection and Counting Using OpenCV

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ABSTRACT:In this paper, we propose a fast and novel method for estimating the number of people in crowded surveillance scenes. This method is able to count people in real time and is robust to changes of illumination and background. The combined rectangle features and cascade of boosted classifier are employed to train a multi-scale head-shoulder detector. The detector can detect human in every frame with a high accuracy. Then human tracking is used to track the detected people and remove duplicates in successive frames. Experiments on a real-world video show the proposed method can give an accurate estimation in real time.

KEYWORDS:Add-Image, Record Video, Count Result.

I. INTRODUCTION

In this python project, we are going to build the Human Detection and Counting System through Webcam or you can give your own video or images. Real-time human detection and tracking video is one of the most active areas in computer vision due to its widespread applications. The ability to detect human beings accurately is crucial to applications such as the visual surveillance system. An intelligent system detects and captures motion information of moving targets for accurate object classification. The classified object is being tracked for high-level analysis. The goal of crowd counting is to estimate the number of people passing through a given line or a given area.

II. RELATED WORK

1. User interaction with an application is required to register and to login.
2. Both the users has to login to the application by entering his email and password.
3. This is achieved through interactive and user-friendly GUI.
4. User interface is the one which hides the internal information from the user. As the name indicates it is the mediator between internal and external views.
5. User will provide input as image or video, System will Detect human and provide the count of the people.

III. METHODOLOGY

3.1 Modules

- Administrator: Administrator of the system is responsible for managing the human dataset.
- Users: Users are the end user who are going to use our system. They will use our system to keep track of people and to check total number of visitors.

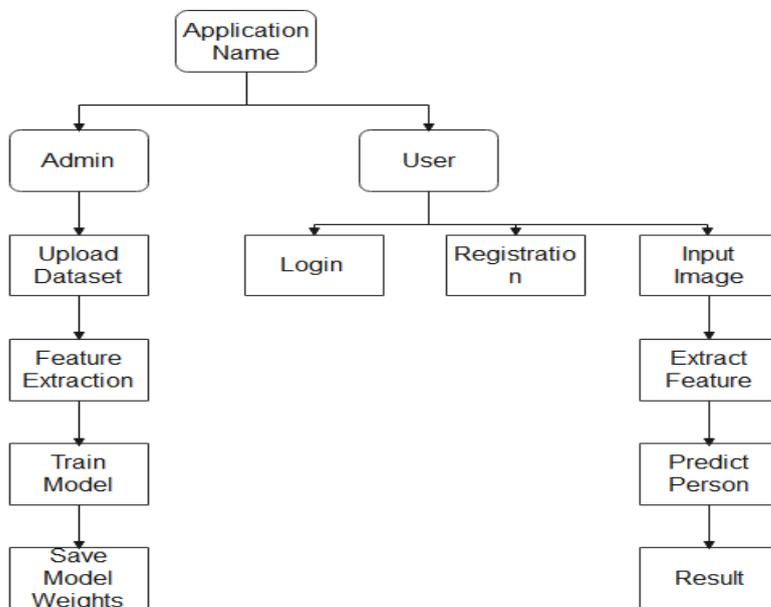


Figure1: Modular design

3.2 Pre-Requisites

Python

Python is an interpreted high-level general-purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant indentation. Its language constructs as well as its object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Keras

Keras is an open-source software library that provides a Python interface for artificial neural networks. Keras acts as an interface for the TensorFlow library. Keras contains numerous implementations of commonly used neural-network building blocks such as layers, objectives, activation functions, optimizers, and a host of tools to make working with image and text data easier to simplify the coding necessary for writing deep neural network code. Keras allows users to productize deep models on smartphones (iOS and Android), on the web, or on the Java Virtual Machine.[3] It also allows use of distributed training of deep-learning models on clusters of Graphics processing units (GPU) and tensor processing units (TPU)

Django

Django is a high-level Python Web framework that encourages rapid development and clean pragmatic design. A Web framework is a set of components that provide a standard way to develop websites fast and easily. Django's primary goal is to ease the creation of complex database-driven websites. Some well known sites that use Django include PBS, Instagram, Disqus, Washington Times, Bitbucket and Mozilla

OpenCV

OpenCV is a huge open-source library for computer vision, machine learning, and image processing. OpenCV supports a wide variety of programming languages like Python, C++, Java, etc. It can process images and videos to identify objects, faces, or even the handwriting of a human. When it is integrated with various libraries, such as Numpy which is a highly optimized library for numerical operations, then the number of weapons increases in your Arsenal i.e whatever operations one can do in Numpy can be combined with OpenCV.

3.3 Proposed System

The project is implemented to track the people and maintain count of them. The details entered in the GUI goes to the file system analyzer a count number is generated and result will be displayed on window.

3.4 Architecture

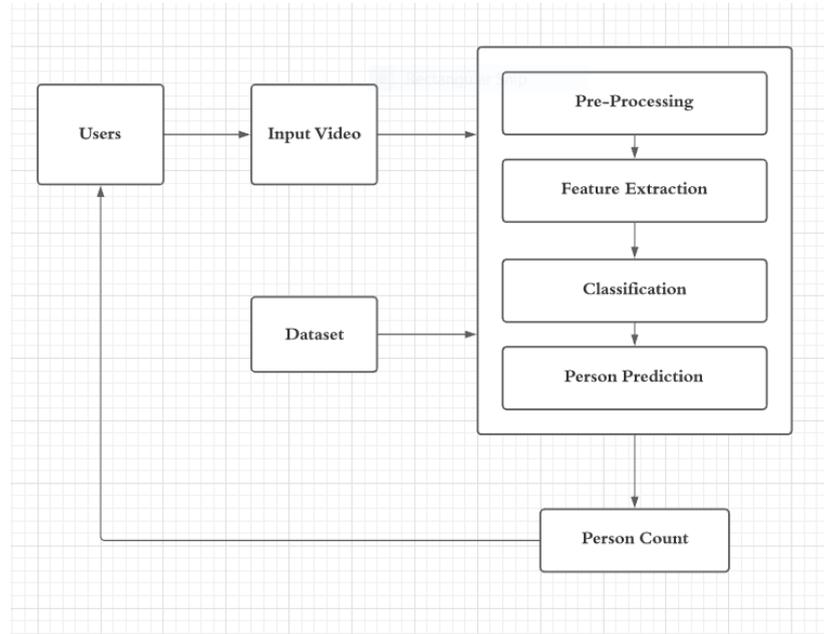


Figure 2:Architectural Diagram

System has following modules:

1. Dataset Module: This module is used by the admin to load the dataset to memory.
2. Initialize Module: This module used to initialize the USB camera.
3. Capture Module: This module is used to capture the video from USB camera.
4. Increment Module: This module is used to increment the person count in the background.
5. Presentation Module: This module is used to present the count to the user.



III.RESULTS



Login

[Not Registered..?Click Here](#)
[Forgot Password..?Click Here](#)



Figure 3: User Login Page



Registration



Figure 4: Register page

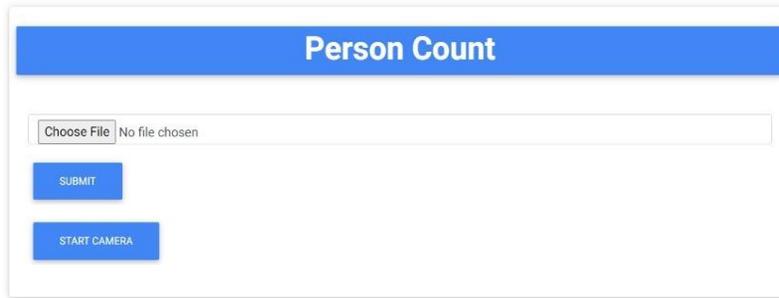


Figure 5: Home Page

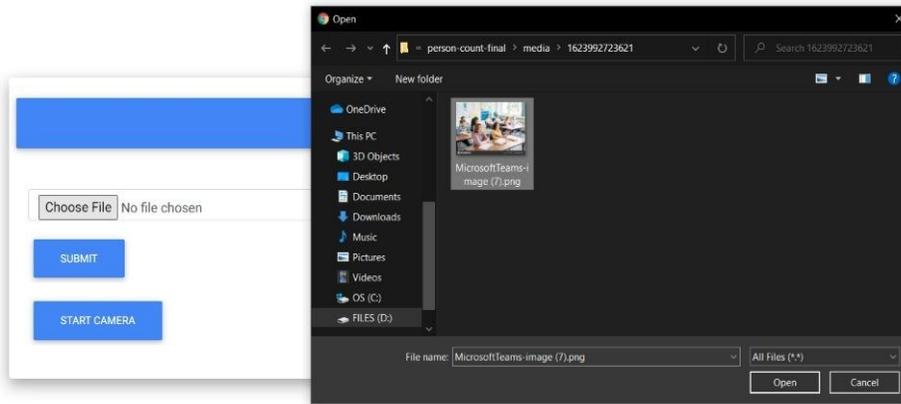


Figure 6: Add Image



[Check another result](#)

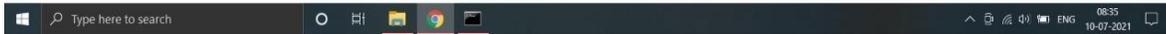


Figure 7:Image Result

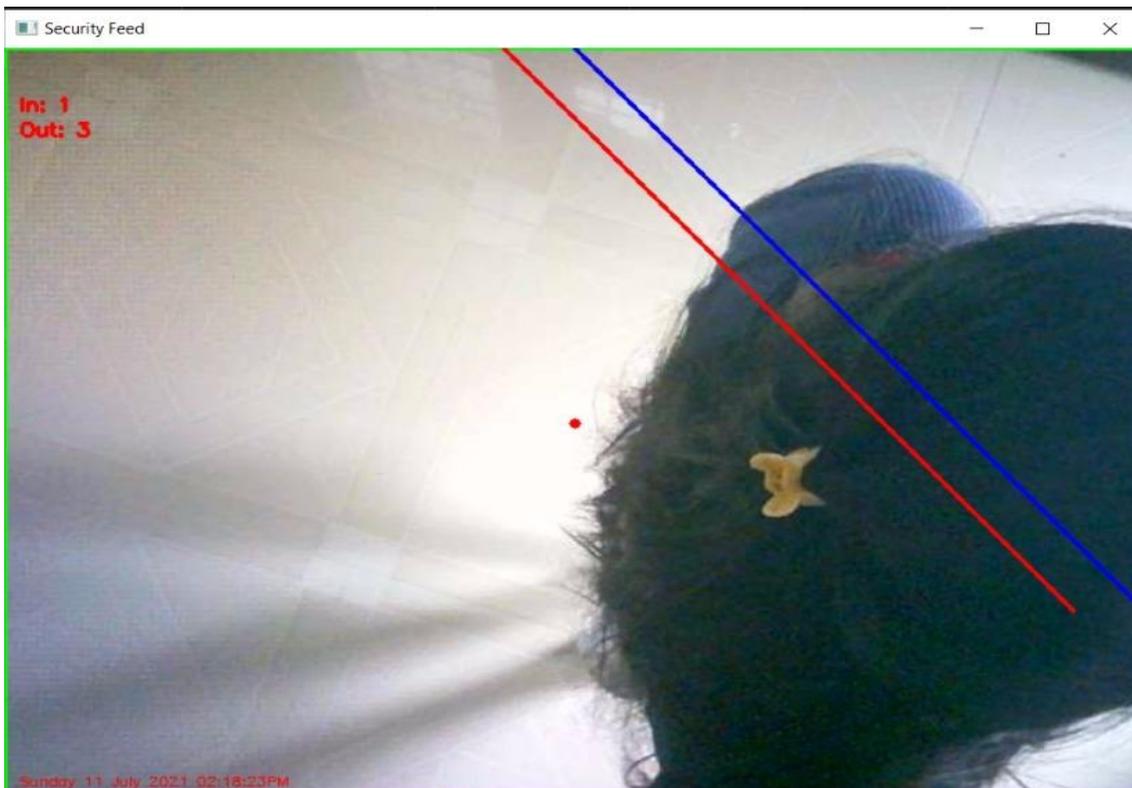


Figure 8:Record Video



IV.CONCLUSION

An A method for human detection and counting has been presented in this paper. The key feature of our work is, we have employed four descriptors to detect four invariant and significant feature of human head-shoulder region to achieve our goal. We studied the influence of various descriptor parameters and conclude that none of them can individually detect human, hence we employed a weight based decision system for a good performance. Experiments performed on several images validate the effectiveness of our approach. In our future work we shall focus on implementing the Omega Model in video, and hence develop a Real-time Smart Surveillance Systems that can decide and label events and give threat alerts for security conscious venues.

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