**Project Based Learning - II**

**MINI PROJECT ON**

# “HUMAN DETECTION AND COUNTING”

**S.E. OF ENGINEERING**

**Department Of Computer Engineering**

SUBMITTED BY

**Vinayak Oza - S190314295**

**Pragati Pate – S190314301**

**Mandar Paygude – S190314309**

**Koushal Rudrawar – S190314316**

**Progressive Education Society’s**

**Modern College of Engineering**

**Department of**

**Computer Engineering Shivajinagar, Pune**

**- 411005**

**A.Y. 2021-2022**

## CERTIFICATE

This is to certify that students from Second Year Computer Engineering have successfully completed their mini project work of **Project Based Learning - II** at P.E.S. Modern College of Engineering in the partial fulfillment of the S.E. of Engineering Degree in Computer under Savitribai Phule Pune University.

Group Members:Vinayak Oza

Pragati Pate

Mandar Paygude

Koushal Rudrawar

Date: 11 May 2022

Prof. Dr. Mrs. S. A. Itkar Prof. Anandrao Deshmukh Prof. Prachi Dusa

H.O.D. (External Guide) (Internal Guide)

Department of Computer Engineering

**ACKNOWLEDGEMENT**

Every orientation work has an imprint of many people and it becomes the duty of the author to express deep gratitude for the same.

I take this opportunity to express my deep sense of gratitude towards my esteemed guide **Prof. Prachi P. Dusa** for her support, encouragement, monitoring and guidance throughout the course of this project which helped me to complete this MINI PROJECT for PROJECT BASED LEARNING-II successfully within scheduled time.

I also take this opportunity to express a deep sense of gratitude to **Prof. Dr. Mrs. S. A. Itkar**  (Head of Computer Engineering Department), for opening the doors of the department and for her moral and technical support towards realization of this work.

I also thank other faculty members for the most valuable time lent as and when required. With all respect and gratitude, I would like to thank all the people who have helped me directly or indirectly

**Title :- HUMAN DETECTION AND COUNTING**

**Problem Statement :-**

**Introduction :-** Over the recent years, detecting human beings in a video scene of a surveillance system is attracting more attention due to its wide range of applications in abnormal event detection, human gait characterization, person counting in a dense crowd, person identification, gender classification, fall detection for elderly people, etc. The scenes obtained from a surveillance video are usually with low resolution. Most of the scenes captured by a static camera are with minimal change of background. Objects in the outdoor surveillance are often detected in far field. Most existing digital video surveillance systems rely on human observers for detecting specific activities in a real-time video scene. However, there are limitations in the human capability to monitor simultaneous events in surveillance displays [1]. Hence, human motion analysis in automated video surveillance has become one of the most active and attractive research topics in the area of computer vision and pattern recognition. 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. In this study, we focus on detecting humans and do not consider recognition of their complex activities.

**Outcome :-** Detecting human beings accurately in a visual surveillance system for diverse application areas including abnormal event detection, human gait characterization, congestion analysis, person identification, gender classification and fall detection for elderly people

**Software Requirement :-** Python (3.9), Open CV, CMake, Open CV Contrib, Visual Studio

**Need :-**

1) Counting the amount of individuals within the stores/buildings/shopping malls etc., in real-time.

2) Acts as a measure towards footfall analysis and during a thanks-to tackle-COVID-19.

3) If the entire number of individuals (say 10 or 30) exceeded during a store/building, we simply alert the staff.

**Scope :-** Human detection is a computer vision technique that allows us to identify and locate humans in an image or video. With this kind of identification and localization, human detection can be used to count human in a scene and determine and track their precise locations.

**Motivation :-** Object detection and tracking is of utmost importance for different kinds of applications such as safety, surveillance, man-machine interaction, driving assistance system, traffic monitoring. Due to the ongoing worldwide Covid-19 Pandemic, it is the upmost need of an hour to implement sustainable systems to provide smooth functioning

**Dataset :-**

**Abstract :-**

In this python project, we are getting to build the Human Detection and Counting System through Webcam otherwise you can give your own video or images. this is often an intermediate level deep learning project on computer vision, which can assist you to master the concepts and cause you to an expert within the field of knowledge Science. Let’s build an exciting project.

Recent research has been devoted to detecting people in images and videos. In this paper, a human detection method based on Histogram of Oriented Gradients (HoG) features and human body ratio estimation is presented. We utilized the discriminative power of HoG features for human detection, and implemented motion detection and local regions sliding window classifier, to obtain a rich descriptor set. Our human detection system consists of two stages. The initial stage involves image preprocessing and image segmentation, whereas the second stage classifies the integral image as human or non-human using human body ratio estimation, local region sliding window method and HoG Human Descriptor. Subsequently, it increases the detection rate and reduces the false alarm by deducting the overlapping window. In our experiments, DaimlerChrysler pedestrian benchmark data set is used to train a standard descriptor and the results showed an overall detection rate of 80% above.

Counting people in visual surveillance is hard and challenging problem. Automatic counting surveillance of individuals publicly areas is vital for safety control. Previously many techniques and methods are proposed. These methods/techniques aren't producing accurate and high performance for difficult situations. Now Foreground Extraction and Expectation Maximization (EM) based methods are proposed, which provides a far better accurate solution for counting people and locating a private. This work presents the security precaution of covid-19 for maintaining social distancing. Single shot detector algorithm (SSD) takes the live stream from camera and convolutional neural network (CNN) will identify the human and assign a private id and therefore the count it accordingly.

**Literature Survey :-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sr. | Title | Authors | Publications | Year | Description |
| 1. | Human Detection using Histogram of oriented gradients and Human body ratio  estimation | Kelvin Lee, Che Yon Choo, Hui Qing See, Zhuan Jiang Tan, Yunli Lee | IEEE Xplore | 2010 | In this paper, we present a human detection system using  motion extraction and Histogram of Oriented Gradients  features (HoG). |
| 2. | Human detection in surveillance videos and its  applications | Manoranjan Paul , Shah M E Haque and Subrata Chakraborty | Springer | 2013 | The characteristics of the benchmark  datasets are presented, and major applications of human  detection in surveillance video are reviewed. |

**Conclusion :-** Detecting human beings accurately in a surveillance video is one of the major topics of vision research due to its wide range of applications. It is challenging to process the image obtained from a surveillance video as it has low resolution. A review of the available detection techniques is presented. At the end of this paper, a discussion is made to point the future work needed to improve the human detection process in surveillance videos. These include exploiting a multi-view approach and adopting an improved model based on localized parts of the image.

**References :-**

1. Kelvin Lee, Che Yon Choo, Hui Qing See, Zhuan Jiang Tan, Yunli Lee : Human detection in surveillance videos and its applications - a review, 2010 (IEEE Xplore).

2. Manoranjan Paul\*, Shah M E Haque and Subrata Chakraborty : Manoranjan Paul Shah M E Haque and Subrata Chakraborty, 2013 (Springer).