International Journal of Advance Research in Science and Engineering
Volume No. 12, Issue No. 04, April 2023
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Human Detection and Tracking

Dr.K.Kanthi Kumar[1], B. S. J. Rani[2], K. Sohith[3], T. Siva Krishna[4], Sk. Haseeb[5]

Professor[1], Students[2-5], Tirumala Engineering College, Narasaraopet, Andhra Pradesh

ABSTRACT:

Human Detection and Tracking could be a immense, vivacious however inconclusive and trending area of computer vision. Due to its immense use in official surveillances, tracking modulesapplied in security and lots of others applications have made researchers todevise a lot of optimized and specialized methods. However, problems are faced inimplementing Human Detection and tracking in real-time; like tracking in real time and giving appropriate optimized results, over dynamic computation to findthe efficient performance with respect to time factor, or multiple objects tracking create this task more difficult. Though,several techniques are devised but stilllies a lot of scope of improvement, however during this literature reviewwe've seen some illustrious and multiple ways Human Detectionand tracking. In this method we will be using Tensor Flow, Open CV library and CNN algorithm will be used. For validation purpose live input video will be taken for the same where objects will be gettingdetected and it can be simulated same for real-time through external hardware added. At the end, we see the proper optimized and efficient algorithm forHuman Detection.

I. INTRODUCTION

The Human Detection and Tracking as a complete can be seen as an advanced mechanism to understand the humans present near to see. Years back when we see such method could have been literally compared to a virtually advanced artificial eye but with development of technology, we can figure out that the algorithm, machinery computation power and advanced datasets have made easier to devise a optimized method for Human Detection and Tracking.

We implemented the algorithm in a way that it is quick and efficient in detecting people in images. Implementing this ideology in a video, we create a rough working of our base model. By the method of improvising the algorithm and usage of the data that we already possess, we intend to broaden our scope and implementation of the current detection system, using a Hierarchical method of classification.

II. EXISTING METHOD

NN (Region-based Convolutional Neural Network) is a popular deep learning-based object detection and tracking system. Here's how it works:

- Object Detection:

The first step is to detect objects in the image using a deep neural network. R-CNN uses a region proposal algorithm (such as Selective Search) to generate potential object locations in the image. Each region proposal is then passed through a convolutional neural network (CNN) to extract features. The extracted features are then

fed into a set of fullyconnected layers to classify the object and generate bounding box coordinates.

- Object Tracking:

To track objects across multiple frames, R-CNN can be combined with a tracking algorithm, such as the Kalman filter or the Optical Flow algorithm. The tracking algorithm takes as input thebounding box coordinates of the object in the current frame, and predicts the location of the object in the next frame based on its previous motion and the current frame features.

- Integration:

Once objects have been detected and tracked, the system can perform further analysis, such as counting the number of objects in the frame or monitoring their behaviour. R-CNN has several variants,including Fast R-CNN, Faster R-CNN, and Mask R-CNN, which improve upon the original R-CNN by reducingcomputational complexity and increasing accuracy. These variants use techniquessuch as region-based CNNs, shared feature maps, and multi-task learning to improve object detection and trackingperformance.

III. PROPOSED METHOD

Here is a proposed method for human detection and tracking using TensorFlow and OpenCV:

- Human Detection:

The first step is to detect humans in theimage or video stream using TensorFlow. This can be done by training a deep neural network on a large dataset of human images to learn features that are indicative of humans. Once the neural network is trained, it can be used to detect humans in the image or video stream. The input image is passed through the neural network, and the output is a set of bounding boxes that indicate the locationof humans in the image.

These bounding boxes can be extracted and passed to the tracking module.

- Human Tracking:

To track humans across multiple frames, OpenCV can be used to implementa tracking algorithm. The algorithm takes as input the bounding box of the human in the current frame, and returns the
bounding box of the human in the nextframe.

- Integration:

Once humans have been detected and tracked, the system can perform further analysis, such as counting the number of humans in the frame or monitoring their behaviour.

The proposed method can be customized and optimized for specificapplications and environments, and can be combined with other computer vision techniques to improve performance. For example, pre-processing techniques suchas image normalization and background subtraction can be used to improve human detection accuracy. Additionally, data augmentation techniques such as image rotation and scaling can be used to increase the diversity of the training dataset and improve model generalization.

IV. RESULTS

The output displayed on the screen by detecting the humans is shown below. And this deteccted humans are

indicated by the red square mark to identify the output easily.

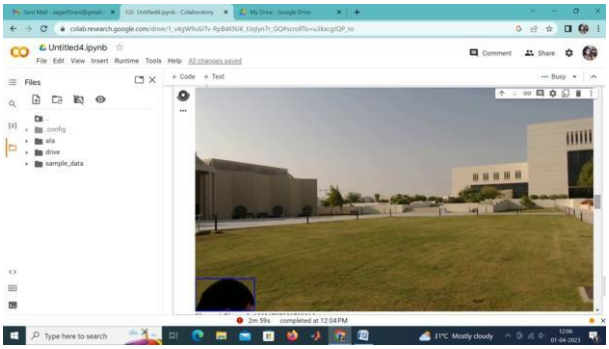

Figure: Working Environment when the person enteredAs shown in the above figure, our projects detects the person when the person enteredinto the camera surveillance.

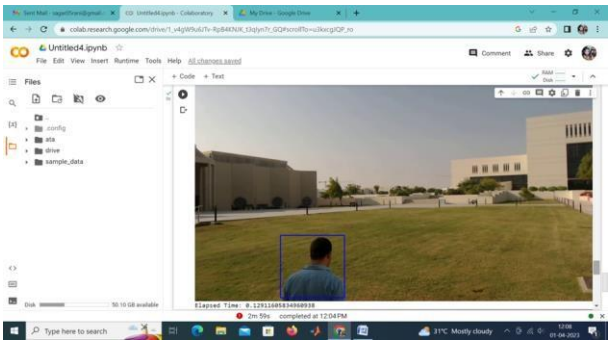

Figure: Person detected image in the working environment.

V. CONCLUSION

Detection is an integral part of security and patrol. For the most part, the job entails extended periods of looking outfor something undesirable to happen. It is crucial that we do this, but also it is a very mundane task. Human detection and tracking in a complex environment is a hard task, since people interact with each other, from groups and may move in unexpected ways.

Background model that can deal with slowillumination changes like light changes between day and night, fast illuminationchanges like clouds blocking the sun.