Crime-Pose: Human Identification System using Posture based Gait Recognition Methods

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***Abstract*—With the rise of terrorist round the world, human identification research has become a asked for area of research. Unlike standard biometric recognition techniques, gait recognition may be a non-intrusive technique. Both data collection and classification processes are often avoided a subject's cooperation. During this work, we proposed a replacement model-based gait recognition technique called postured based gait recognition. The datasets are obtained by analyzing the freestyle walk of a private and that we have trained a machine learning model with these datasets so as to predict who the individual is. By storing the model we will successfully predict who a personal is by giving a picture or video as input. The proposed system performs well for varying class sizes and may help implementing a reliable security closed-circuit television.**

***Keywords*—Posture detection, gait recognition, python, deep learing**

I. INTRODUCTION

A crime could be a deliberate act which will cause physical or psychological harm, also as property damage or loss, and may cause punishment by a state or other authority in step with the severity of the crime. the quantity and varieties of criminal activities are increasing at an alarming rate, forcing agencies to develop efficient methods to require preventive measures. within the current scenario of rapidly increasing crime, traditional crime-solving techniques are unable to deliver results, being slow paced and fewer efficient.. After the crime occurred, police or investigators first must find the the intial suspect to proceed the investigation. First the investigators look for the criminal with same background of the crime. For this we search with the info set of that criminals with similar crime background and find the suspect by identifying their posture using camera from the surrroudings of the crime site. Using this we are able to eliminate terrorist threats by identifying the terrorists freely roaming around our country by posture detection. Our aim is to create a person's identification system from freestyle walks using walking style and gait analysis. Most of the existing human identifications require the cooperation of the subject, and also needs to be done in close proximity to the subject. We propose the model that performs functions buiid a machine learning model that analyses freestyle walks and helps us in identifying a person uniquely and then prediction using the model that is created.

II. RELATED WORKS

Human Body Posture Recognition with Discrete Cosine Transform [1]: his study proposes a method to come up with effective features to classify fundamental anatomy postures in image sequences like standing, sitting on the chair, sitting on the ground, bending and lying down. Truncated discrete cosine transform (DCT) is used to get features before performing truncated singular value decomposition (SVD). Discrete cosine transform (DCT) ex- presses a finite sequence of information points in terms of a sum of cosine functions oscillating at different frequencies. Single value decomposition (SVD) is a pretty algebraic transform for image processing applications. it'll reduce a matrix to its constituent parts so as to form certain subsequent matrix

calculations simpler. The truncated DCT disregards unnecessary values and thus makes features more simple and lightweight. it'll improve the classification speed.Newly extracted features will increase the accuracy of human posture.

The Recognition of moving Human body posture based on Combined Neural Network [2]: The silhouette feature, skeleton feature and moment invariant feature of organic structure posture are firstly extracted and each feature vector is inputted into their own neural network classifiers. Then the outputs of all the classifiers are fused along with Dempster-Shafer theory to create a combined neural network. The outputs of three separate neural networks are fused together using D-S evidence theory to provide an accurate recognition result. Dempster shafer theory is general framework for reasoning with uncertainty, with understood connections to other frameworks like probability possibility and imprecise probability theories.The powerful classifier with high recog-nition rate will be built. This method is more accurate than

single neural network classifier for moving chassis posture recognition. Extremely useful for homecare systems for monitoring elderly people.

Learning and Synthesizing Human body motion and posture [3]: Here we estimating human body posture and motion from a video sequence. Human pose is defined as the instantaneous image plane configuration of a single articulated body in terms of the position of predetermined set of joints. First, statistical segmentation of the human bodies from the background is performed and low-level visual features are found given the segmented body shape. Here we map the visual features to the body configuration. Given a set of body motion sequences for training , a set of clusters is built in which each has statistically similar configurations. It is done using Expectation Maximization Algorithm. Then for each of clusters a neural network is trained to build this mapping. From this set, the most likely pose is extracted given the learned probability distribution and the visual feature similarity between hypothesis and input.

View Adaptive Neural Networks for High Performance Skeleton-based Human Action Recognition[4]: Skeleton-based human action recognition has recently attracted increasing attention thanks to the accessibility and the popularity of 3D skeleton data. One of the key challenges in action recog-nition lies in the large variations of action representations when they are captured from different viewpoints. In order to alleviate the effects of view variations, this paper introduces a novel view adaptation scheme, which automatically determines the virtual observation viewpoints over the course of an action in a learning based data driven manner. Rather than following the human predefined criterion to reposition skeletons for action recognition, the proposed networks are ca- pable of adapting the observation viewpoints to the suitable ones by itself, with the optimization target of maximizing the recognition performance. The prevalence of cost-effective depth cameras such as Microsoft Kinect , Intel RealSense , dual camera devices and the advancement of powerful techniques for human pose estimation from depth make 3D skeleton data easy to obtain. In a practical scenario, the viewpoints of the cameras are flexible and different viewpoints result in large differences in skeleton representations even for the same scene. The actor could conduct an action in different orientations. Moreover, he/she may dynamically change his/her orientations as time goes on. This project solves this.

III. PROPOSED SYSTEM

The project is intended for any user who has registered to the system with valid credentials. The system admin enjoys more privileges and the product is developed mainly for security surveillance. The posture-based recognition system is not size-sensitive, and has high accuracies. Hence, the proposed system would serve as a suitable tool in forensic and surveillance fields.

A. Overview of Developer's Responsibilities

- Analyze the problem and propose the solution.
- Should choose the best possible algorithm for the system.
- Do not use the word "essentially" to mean "approximately" or "effectively".
- Choose a programming language which is most suitable and can support most of the libraries and frameworks required for the project.
- After suitable programming language is chosen the developers must learn more about the language and the libraries and framework that are needed.
- Selection of appropriate libraries,frameworks and their respective documentation.
- Maintain appropriate coding standards and design.
- The developers need to select the data-set from a reliable source for the input to the application.
- The result should be formatted in a way that it can be used by any end users.
- Check whether the intended system works as expected

A use case diagram at its simplest may be a representation of a user's interaction with the system that shows the link between the user and also the different use cases during which the user is involved.The different users that may use this product are:

1. Surveillance admin - Admin has the whole control over the system and might up- date/remove the dataset. he's also answerable for keeping track of the users within the system.
2. User - The user can perform the subsequent functions within the system:
   i. Upload an image/video
   ii. Review results on whether the person is identified or not.

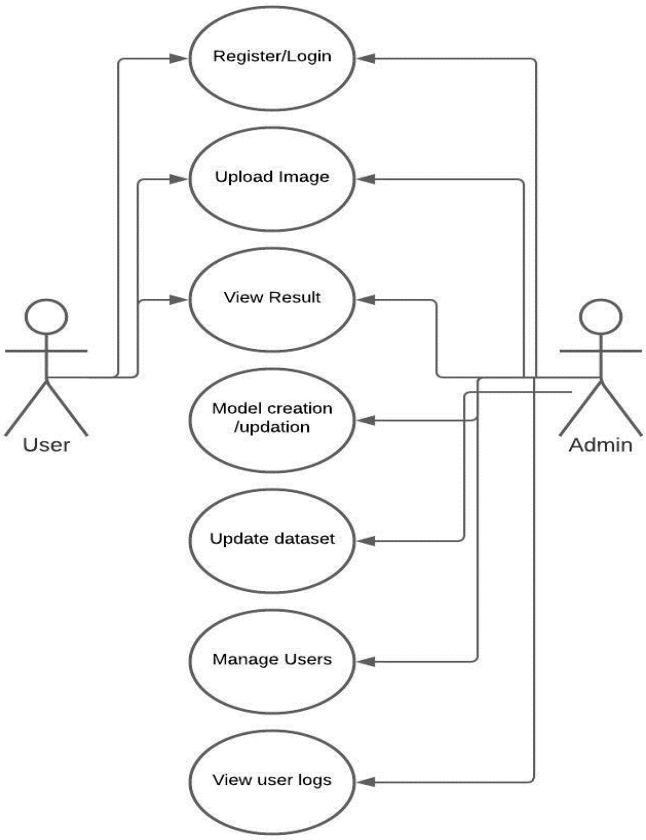

Fig 3.1: Use-case diagram

IV. SYSTEM ARCHITECTURE

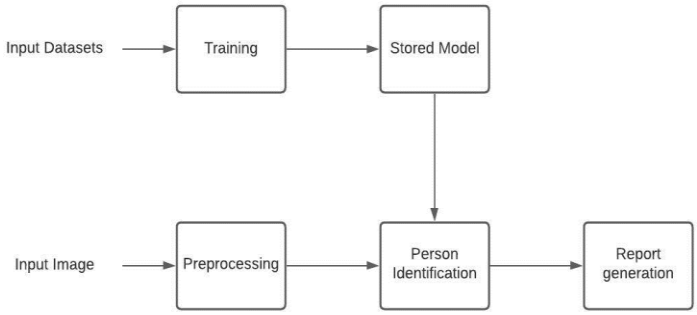

Fig 4.1: System Architecture

A. Data collection module

Description: This module performs various operations on the datasets collected. The datasets used are obtained using Teachable machine.

Input: The datasets are obtained using Teachable machine. The freestyle walks are recorded using web cam as 6 second videos and converted to jpg format. The samples are stored in JPG format

Output: The samples are stored in JPG format. Datasets are separated into classes and stored.Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

B. Training the model module

Description: This module performs the training and validation of the model using the training and validation datasets. The model that is created is saved. The performance of the model is measured using various parameters

Input: The datasets obtained from Teachable machine are given as input. Format is JPG. This is then used to perform preprocessing operations.

Output: The model obtained after training is stored in h5 file format.Component heads identify the different components of your paper and are not topically subordinate to each other.

C. Person detection module

Description: This module performs human subject detection and identifies the person by com- paring with the stored model.

Input: Image or Video sequence is given as input

Output: Based on whether the person is identified, report is generated. If success, the image is displayed along with the details of the person.

D. User interface module

Description: This module performs human subject detection and identifies the person by com- paring with the stored model.

Input: Image or video is obtained from the user

Output: Based on whether the person is identified, report is generated. If success, the name of the person is displayed to the user.

1. Activity diagram

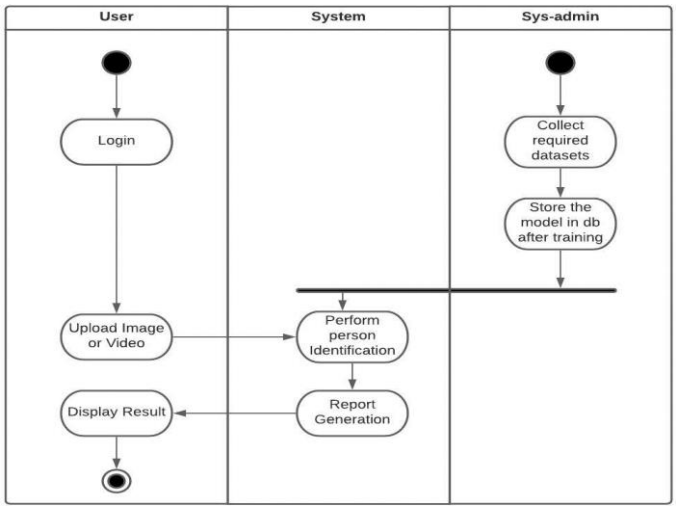

Fig 4.2: Activity diagram

Text heads organize the topics on a relational, hierarchical basis. For example, the paper title is the primary text head because all subsequent material relates and elaborates on this one topic. If there are two or more sub-topics, the next level head (uppercase Roman numerals) should be used and, conversely, if there are not at least two sub-topics, then no subheads should be introduced. Styles named “Heading 1”, “Heading 2”, “Heading 3”, and “Heading 4” are prescribed.

II. Figures and Tables

Database design: The images and videos are stored in the database using django models.The project uses SQLite database to store the input images/videos.

Field name	Datatype
Imagename	String
Imagefile	jpeg

Fig 4.3: Table 1

Field name	Datatype
Videoname	String
Videofile	mp4

Fig 4.4: Table 2

V. CONCLUSION

The work presents a new approach to security surveillance.The approach is simple and the accuracy we were able to achieve from the machine learning model has been observed to be sufficient enough to build a reliable ’Person identification System’.The average accuracy of the training model

is 100 percent.These results show that the implemented method efficiently generates a model capable of predicting a human subject with pinpoint accuracy.

VI. REFERENCES

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