

DEEP LEARNING BASED SUSPICIOUS BEHAVIOUR ANALYSIS FROM SURVEILLANCE VIDEO

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ABSTRACT

The ultimate aim is to provide the indoor security using the CCTV (Closed-Circuit Television) camera. The CCTV Camera is a video camera that feeds or streams its image in real time; Webcams are known for their low manufacturing cost and their high flexibility, making them the lowest-cost form of video conversations and inefficient security issues. The system will detect suspicious activity i.e. unauthorized activity in a restricted place in a video by using AMD algorithm and will start tracking once the user has specified a suspicious person by his/her on the display. The main purpose of this project is to split the given input video into frames and the frames will be converted into good frames and bad frames. Advanced Motion Detection (AMD) achieves complete detection of moving persons. We will only the bad frames will be taken into account from which the classification takes place. This system can be implemented by using the MATLAB software tool. Machine learning concepts drastically decrease the time needed to arrange an exact map. In this project we will be using Deep Belief Network Algorithm for classification. From the results we can prove that DBN is more accurate in predicting the suspicious activity.

INTRODUCTION

Deep Learning:-

Deep Learning is defined as an application of artificial intelligence where available information is used through algorithms to process or assist the processing of statistical data. While Deep Learning involves concepts of automation, it requires human guidance. Deep Learning involves a high level of generalization in order to get a system that performs well on yet unseen data instances.

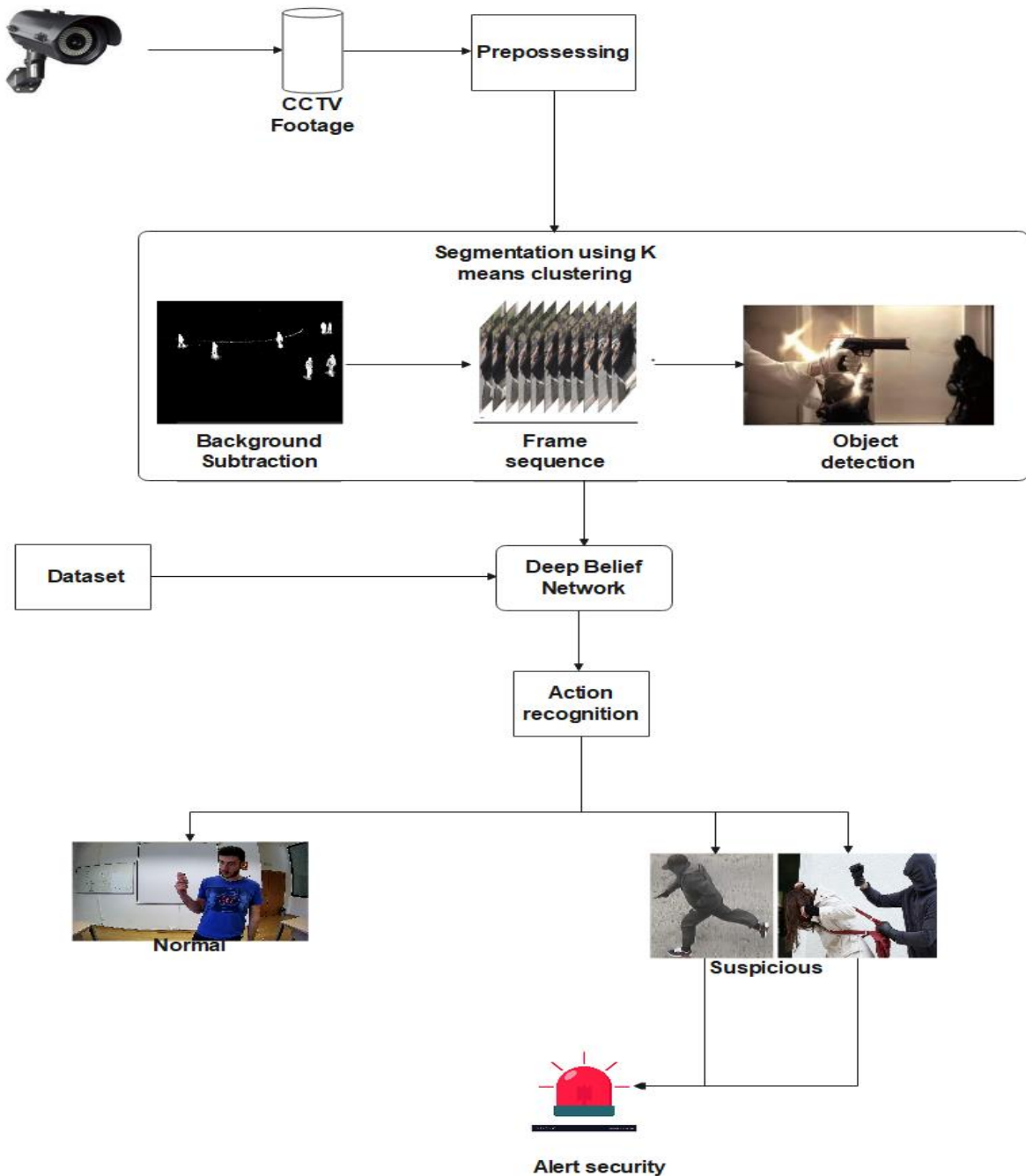
PROBLEM STATEMENT

1. The problem statement was CCTV help to find the criminal but not earlier the suspicious activity occurs.
2. Existing system stores the data in form of records only and needed continuous monitoring which is labor intensive task.

OBJECTIVE

- To convert video to image.
- To frame segmentation using K means clustering.
- To extract frame by background subtraction and frame sequence.
- To detection the object.
- To action recognition using Deep Belief Network (DBN).
- To classify normal activity or suspicious activity with trained dataset.
- To alert a security.

ARCHITECTURE DIAGRAM



ARCHITECTURE EXPLANATION

1. Initially if we upload a video, in preprocessing it will split the video into frames.
2. In segmentation process splitting to collection of images.
3. By using K means clustering do extraction process following Background subtraction, frame sequence, Object detection.
4. The training dataset for classification using a Deep belief network.
5. In classification process action recognition normal or suspicious behavior and finally any activity find in model to alert the security.

MODULES

- Video Acquisition
- Pre-processing
- Segmentation
- Extraction
- Action recognition

I. Video Acquisition

Acquisition is the process of collection of videos. These videos are downloaded from the online dataset provider called Kaggle.com.

II. Pre-processing

Image preprocessing includes converting RGB images into Gray scale images. An RGB image means the images present with its original colors. Gray scale images have the combination of black and white. Conversion of RGB to gray scale is done for enhancing the dataset available. Converting the images to gray scale helps in improving the accuracy of the result. Gray scale images help to reduce noise and also make the background neutral. It also helps to improve brightness of the image. Data augmentation is a way of creating new data which has benefits like the ability to generate more data from limited data and it prevents over fitting.

III. Segmentation

Segmentation breaks the image down into meaningful regions. It divides digital image into multiple segments. The goal is to simplify or change the representation into more meaningful image. It differentiates between the objects we want to inspect further and the other objects or their background. It consists of segmenting the converted gray scale images using K means segmentation.

IV. Extraction

Extraction is extracting or showing of the segmented portion of the image so that classification becomes easy. Features are extracted in order to differentiate between the images. Extraction is used in almost all machine vision algorithms. The common goal of feature extraction and representation techniques is to convert the segmented objects into representations that better describe their main features and attributes.

V. Action recognition

Here we use the concept of Deep Belief Network algorithm. The last module includes the classification in which Tensor Flow and Machine Learning algorithm will be used. Tensor Flow is a MATLAB friendly open source library for numerical computation that makes machine learning faster and easier. Tensor Flow allows developers to create dataflow graphs - structures that describe how data moves through a graph, or a series of processing nodes.

Each node in the graph represents a mathematical operation, and each connection or edge between nodes is a multidimensional data array, or tensor.

TECHNOLOGY

Development Platform: MATLAB IDE

Language: Matlab

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