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Unusual Human Activity Detection Using Opencv Python With Machine Learning

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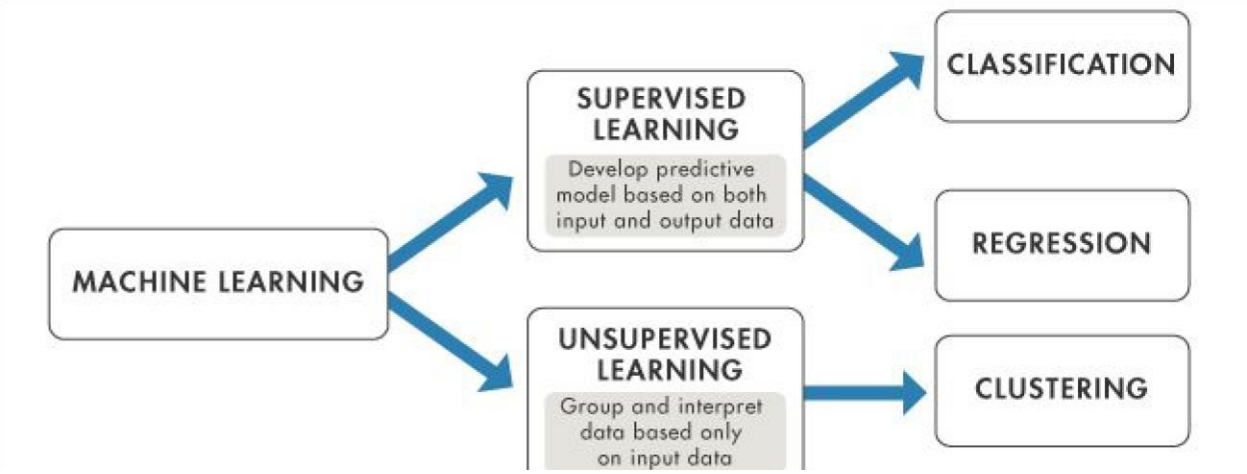
Abstract

Within Proposed Paper, We Introduce A Completely Unique Method For Detecting Unusual Activities Of Human.An Activity Which Attracts The Attention Of Others Is Classified As Unusual.It Can Be Quarreling Or Any Suspicious Behaviour Which Is Not Appropriate. A System Has Been Proposed Which Uses Machine Learning Algorithms To Analyse Human Behaviour And Classify It Into Usual Or Unusual.The System Uses Concept Of Supervised Learning.The System Is Developed To Try To Automate The Manual Surveillance System.Security Is Major Concern Today. So There Is A Need To Develop A System Which Automatically Detects Suspicious Behaviour.

Keywords- *Unusual Act , Detection, Video Surveillance, Opencv, Image Processing, Machine Learning, Face Recognition, CNN.*

1. Introduction

Today Human Behaviour And Pattern Of Human Activity Are Precious In Tracking And Detecting Human Behaviour. In Various Areas Cctv Cameras Are Being Used. Over The Course Of Time Various Processes Have Been Automated. Thus A Need Arises To Automate Video Surveillance Systems For Tracking Human Behaviour And Detection Of Suspicious Activities. With Help Of New Technology And Various Machine Learning Algorithms It Is Possible To Track Human Behaviour.



2. Literature Survey

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Various Researches Have Been Performed In This Field To Try To Analyse And Detect Human Behaviour.A Model Have Been Developed By Using Markov Logic[1] To Try To Analyse Human Behaviour Using Second Order Predicate Logic.Also Objection Is Done Using The [2] Concept Of Similar Pixels Form Same Objects.A Model Has Been Developed To Analyse The Motion Of Moving Objects[4 7]. The Motion Influence Map Is Used Accordingly To Construct Behaviour.Use Open Cv Library Along With Tensor Flow Is Done To Find The Mapping Of Tensor Behaviour Of
Objects..In[5 8] A Method Has Been Introduced To Divide Image In Blocks And Process Each Block Individually.

3. Proposed System

We Propose A System Making Use Of Opencv Library Implemented In Python.Opencv Initially Developed By Intel For Image Processing.It Has Built In Function For Performing Various Actions On Images.It Makes Use Of Numpy Library To Store The Visual Images Into A Stream Of Frames. Basically An Image Is Broken Into Frames. Then This Images Are Stored In A Stream Of Bytes. Then Consecutive Frames Are Compared I.E If There Is A Movement Of A Certain Object Then That Byte Stream Representing That Object Will Change.So Comparing Streams Of Consecutive Frames Moving Objects Are Detected And Pattern Of Their Motion Is Recorded.By Analysing These Patterns The Nature Of Behaviour Of Objects Is Detected.

The Basic Steps Are

I) Optical Flow Of Blocks:

The Frame Is Divided Into Blocks.Basically Each Video Is Broken Into Frames And These Frames Are Divided Into Blocks. Where Index Can Be Given To All Blocks By {A1, A2...An}.A Frame Of Size 240*320 Divided Into 48 Blocks Where Each Block Is Of The Size 20*20.

II) Calculate Optical Flow Of Every Blocks:

One Frame Is Divided Into Blocks. Then Each Frame Is Considered Separately And Optical Flow Is Calculated For Each Frame. This Optical Flow Is Very Important For Further Image Processing For Generating The Motion Influence Map. After Dividing A Frame Into Blocks We Compute Optical Flow Of Every Block By Calculating An Average Of All The Pixels In A Block.

III) Generate Motion Influence Map:

A Motion Influence Map Is Generated Using .Basically This Map Describes The Motion Of Block. Using Motion Influence Map The Behaviour Of The Object Is Analysed.This Behaviour Is Studied And Based On This The Type Of Behaviour Is Decided.This Motion Influence Map Is Very Useful For Feature Extraction Purpose. We Can Use This Motion Influence Map For Analysing And Generating Patterns Of Motions Of Human Activities. Similar Activities I.E Will Have Similar Motion Influence Map.

IV) Feature Extraction:

Using The Motion Influence Map The Features Of Objects Are Extracted. These Features Are Studied For Detecting Type Of Behaviour. The Feature Extraction Phase Is Vital In Determining The Objects Behaviour And Identifying The Behaviour.Similar Activities Will Have Similar Features Hence We Can Say That Features Extracted By Using Motion Influence Map Will Be Identical[9]. A Vector Consisting Of Features

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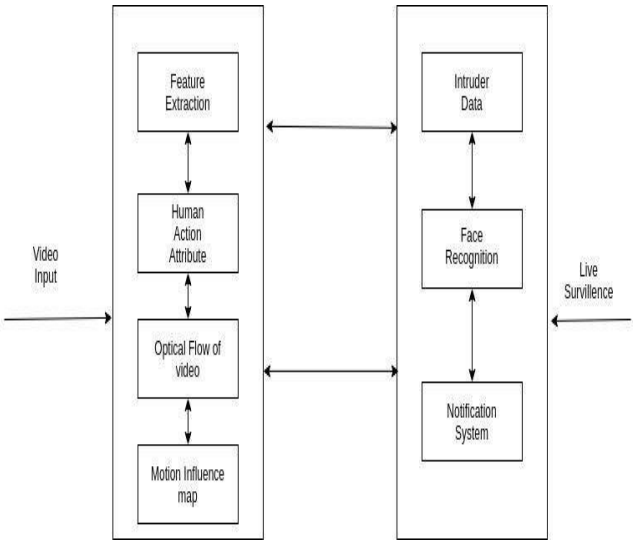
Can Be Extracted From A Well Defined Cuboid Consisting Of N*N Blocks Among The Most Recent X Quantity Of Frames.

4. Working Of System

This System Requires Supervised Learning. Initially The System Is Trained Using Various Training Samples .Various Kinds Of Behaviour Are Studied. Finally A Test Data Is Given As Input. It Performs Feature Extraction And Analyses The Behaviour, Tracks Motion Of Objects And Finally Classifies The Type Of Activity..



5. Future Scope

The System Can Be Merged With Face Detection System So As Whenever An Unusual Activity Is Detected The Identity Of Individuals Can Also Be Detected. Also Using Machine Learning Algorithms An Effort Can Be Made To Predict The
Unusual Activity Before The Activity Occurs.Other Applications Can Be

1. Send Notification To Android Application Using Cloud Server.
2. Work On Multiple Activities Related To Abnormal Behaviour Of Human Being.
3. Improving Accuracy To 85% (Current System Is In Between 70-75 %).

6. Conclusion And Result

This Paper Enlightens All The Issue ,Challenges And Issue Faced By Human Behaviours. An Analysis Of Detection Techniques Like Unusual I.E Suspicious Behaviour Of Human, Detection Of Motion. Suspicious User Activities Are Shown As Output By Our System.

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