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AN INTELLIGENT SYSTEM FOR CROWD ACTIVITY BEHAVIOR DETECTION

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ABSTRACT

Our paper aims to develop a completely automated, multiple camera surveillance and intelligent monitoring system that detect theft in the shopping mall using human behavior analysis that finds the activity of persons who have mischief intentions. These systems generate warnings if they detect a suspicious person or unusual activity before the actual activity takes place. It also generates alert for such events and sends message of observed activities through Wi-Fi to a human operator for immediate action and response decision.

Keywords:Abnormality Detection, Surveillance System, Behavior Analysis, Sensor Cameras, Intent Recognition, Intelligent surveillance, Ambient Intelligence.

1. INTRODUCTION

Today's reconnaissance frameworks differ in multifaceted nature, proficiency and exactness. Numerous observation frameworks oblige the utilization of a more noteworthy number of Polaroid's. The work force viewing the screens are still loaded with recognizing an unusual demonstration or condition indicated on one of the screens, figuring out which Polaroid, and which relating zone of the secured range is recording the anomalous occasion. Our point is to give a mechanized insights feature reconnaissance framework which finds the robbery proposition of a specific individual in a shopping center utilizing conduct examination and alert is initiated through Wi-Fi from the remote sensor Polaroid controller to summon a manager to promptly see the apropos feature pictures demonstrating the clear burglary in advancement and access its exactness.

To create and convey a completely mechanized, different Polaroid observation and observing framework that identifies burglary in the shopping center utilizing human conduct examination that finds the pernicious aim of persons. Framing an observation framework which conquers the issues of the former reconnaissance frameworks that screens human exercises by sensors that could give early cautioning of burglary exercises before ruinous moves make place and to caution watched exercises by Wi-Fi to a human administrator for reaction and choice. In this manner fabricating the remote Polaroid robotized reconnaissance wherein human recognition is not needed.

2. LITERATURE REVIEW

David G. Aviv invented a surveillance system having at least one primary video camera for translating real images of a Zone into electronic video signals at first level of resolution; Which are indicative of individuals having a criminal intent; activating at least one secondary sensor and associated recording device being in response to determining that the individual has a predetermined level of criminal intent.

Alexander Kolarow tested intelligence video surveillance at a local airport to find theft. In order to evaluate the saving of time provided by the system, they reenacted a theft scenario on an airfield: Person A removed a radio receiver from a small aircraft standing in a hangar.

Paulidis has designed co-operative camera network which is an indoor application surveillance system that consists of a network of nodes. Each node is composed of a PTZ camera connected to a PC and a central console to be used by the human operator. The system reports the presence of a visually tagged individual inside the building by assuming that human traffic is sparse (an assumption that becomes less valid as crowd levels increase). Its purpose is to monitor potential shoplifters in department stores.

Tao Xiang was proposed novel framework is developed for automatic behavior profiling and online anomaly sampling/detection without any manual labeling of the training data set. With that, the persons who came to mall with malicious intention can be stopped by automatic behavior prediction.

The Knight system is one in a number of other surveillance-related projects. Recently, they augmented Knight to help the Orlando police department with automated surveillance and installed it at four locations in the downtown Orlando area.

3. RELATED WORK

Shoplifting speaks to a significant issue for retailers in shopping centers. Retailers lose more than $13 billion in stock every year because of shoplifting, as indicated by the National Association for Shoplifting Prevention. Most present feature reconnaissance frameworks require a human administrator to always screen them. Hence the feature from these Polaroids is typically observed sparingly or not in any way; actually it is regularly utilized just as a record to inspect an episode once it is known to have occurred. Trouble can happen if one administrator need to screen various Polaroid sees in the meantime, as the ideal fixation compass for an individual is about 25-30 minutes. Considering all these actualities, another era of observation frameworks with ongoing information preparing is required where the vast majority of the work burden would be carried out by workstation.

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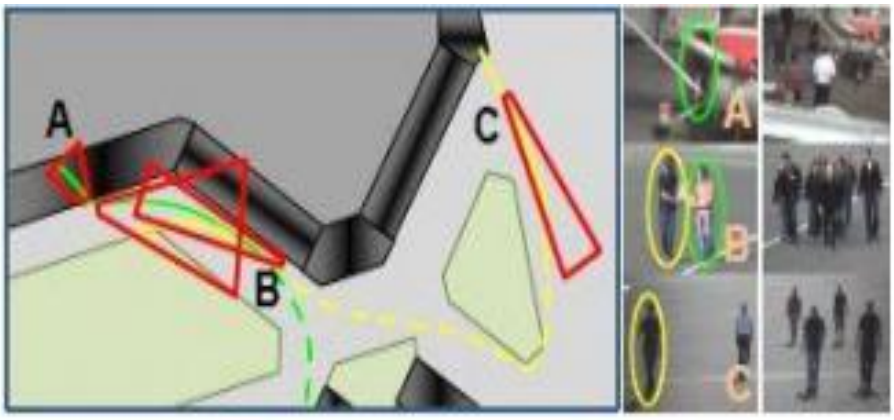

Fig.1. Illustration of Scenario

Basic idea here is to subtract one frame from another subsequent frames and label any difference that is big enough (threshold) as Foreground .This method mainly catches motion in the frames. For simplicity, let's say we have three single-channel images: frame1, frame2, and Foreground. function can be used for such differencing.. To reduce noise, we can apply threshold concept. This removes unwanted pixels which add to noise in our data. Thresholds are manually adjusted to suit our needs. cvThreshold( ) is a tool for applying thresholding. We will clean up small noise areas with cvErode( ) Function . detect malicious activities. It would be so easy if system on its own recognizes some events as malicious and extract only those frames which are providing suspicious activity. The endless hours of watching the video can be avoided. Moreover assistance provided by system during live feed of surveillance may prove beneficial as it can alert the observer of a possible danger and drag his attention to a particular activity which he might have neglected in absence of intelligent system.In the light of such weak security infrastructure we propose a method to develop an intelligent system which not only will capture and feedback the video at real time but also model human behavior.[2] We think of detecting , modeling and classifying human behavior using image processing to detect malicious behavior. Further we may maintain a database of suspects found over time and use face detection [24] and recognition to identify the probable matches for the suspects.

4. ANALYSIS

Fig.2. Applying Detection

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A surveillance system having at least one primary video camera for translating real images of a Zone into electronic video signals at a first level. It is beneficial for the input camera to view the area under surveillance from a point located directly above, e.g., With the input camera mounted high on a Wall, a utility tower, or a traffic light support tower.It will gather experts in human factors, signal processing, computer vision, and surveillance technology. In a first stage, focus will be on human factors in order to define and model behaviors. Then, the focus will be shifted towards automatic analysis of surveillance data (video and audio). It will create models of behavior that can be used to describe behaviors to be detected and how they can be observed. Such models will enable the prediction of the evolution of behavior; so that potentially threatening behavior can be detected as it unfolds, thus enabling pro- active surveillance. In order to detect behavior defined by these models, advanced methods for sensor data analysis are needed. These methods should extract sensor data features that can be coupled to the defined behavior primitives, and thus detect the presence of the (potentially) threatening behavior and to detect behavior that is not considered normal. Once the objects within each sampled video frame are segmented (i.e., detected and isolated), an analysis is made of their relative movements with respect to the other objects. For example, subsequent differencing signals may reveal that an individual's arm is moving to a high position, such as the upper limit of that arm's motion, i.e., above his head) at a fast speed. This particular movement could be perceived, as described below, as a hostile movement with a possible criminal intent requiring the expert analysis of security personnel.

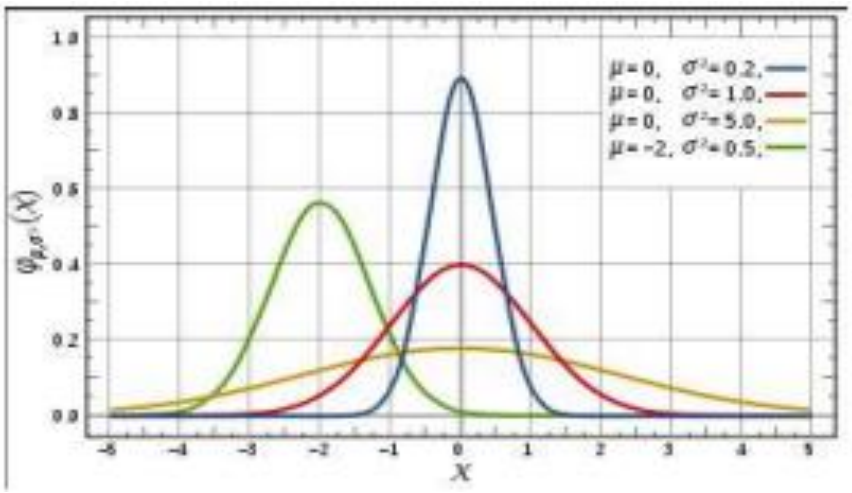

Fig.3. Output Curves

The recent interest in surveillance in public, military and commercial scenarios is increasing the need to create and deploy intelligent or automated visual surveillance systems. The increasing demand for security by society leads to a growing need for surveillance activities in many environments. Lately, the demand for remote monitoring for safety and security purposes has received particular attention, especially in the following areas. Transport applications such as airports, maritime environments, railways, underground and motorways to survey traffic. Public places such as banks, supermarkets, homes, department stores and parking lots.

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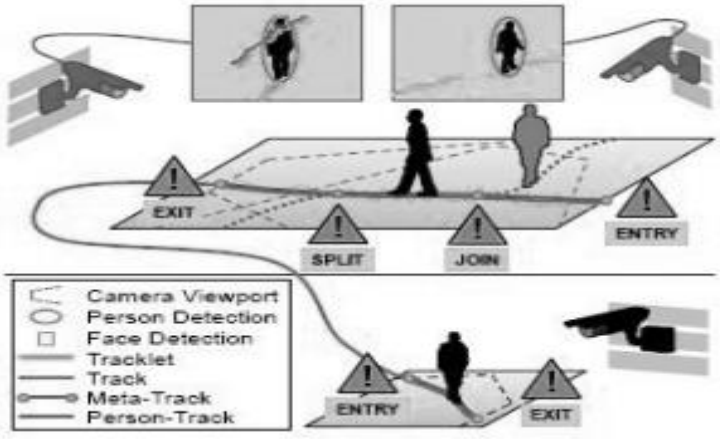

Fig.4. Steps in Detection Persons

CONCLUSION

The developing interest for wellbeing and security has prompted more research in building more productive and shrewd mechanized reconnaissance frameworks. Subsequently, future difficulties to create a wide-region appropriated multi-sensor reconnaissance framework which has hearty, continuous machine calculations equipped to perform with negligible manual reconfiguration on variable applications. The profits of taking preventive measures against retail burglary need to be stressed by introducing mechanized visual observation frameworks which utilizes human conduct dissection.

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