Prior arts:

D1: US 20140063236 A1 “Method and system for automatically recognizing facial expressions via algorithmic periocular localization” (06/03/2014)

D2: EP 2899706 A1 “Method and system for analyzing human behavior in an intelligent surveillance system” (29/07/2015)

FORM 2

THE PATENTS ACT 1970

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THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

1. TITLE OF THE INVENTION

AN AUTOMATED SYSTEM FOR THEFT DETECTION BASED ON HUMAN STRUCTURE AND EXPRESSION IDENTIFICATION USING VIDEO SURVEILLANCE

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification particularly describes the invention and the manner in which it is to be performed.

FIELD OF THE INVENTION

The present invention generally relates to security system and computer vision system and in particularly relates to detecting thief that based on human structure and expression identification.

BACKGROUND OF THE INVENTION

In modern world, technology is so advanced that all shopping malls or banks are covered by video surveillance for capturing the movements in the area. Video cameras are installed at the every possible place of the area. If there is some unusual movement is happened, cameras only capture the activity or movement at that time. Cameras don't raise any alarm for any protection. In today's world, everyone give their concern towards the security system. Security system can protect us from any unusual action.

Surveillance cameras can be accessed remotely on computers, smart phones, and tablets. They are often used in this method when homeowners are out of town, to watch for deliveries and other service personnel like caregivers and landscapers, and to monitor the arrival of children after school. They can also be used to record any security breaches, which could result in having footage of a home invasion, including a good look at the burglars and perhaps even the vehicle they drove.

Computer vision techniques are increasingly used to automatically detect or classify objects or events in images. For example, behavior modeling techniques are often applied to identify human behavior patterns. Typically, behavior analysis and modeling systems initially learn the patterns of behavior and thereafter detect deviations from such patterns of behavior. Generally, conventional behavior analysis techniques are focused on the detection of unusual events.

For security issues, a alarm system is generated that includes: a face identification and discrimination system, which consists of low-light, visible light, infrared light, and thermo-luminescence camera and/or digital camera device for photograph of inside and outside of automobiles, and face identification and discrimination hardware and software system for testing whether a mask or facial adornments or whether his/her face is directed at the camera; redundancy device and/or redundancy function modules, anti-interference system for communication and anti-destructive detection system; a automobile status recorder, which can record the statuses on the inside and outside of the automobile

before, during and after an emergent event picked up by the camera; a multi-functional burglar, anti-destructive and anti-hijacking alarm for automobiles, which can transmit a radio image to a remote equipment for reporting an incident. This invention can also be used for every supervision systems.

In one case, a movement human abnormal behavior identification method is generated that based on template matching, which mainly comprises the steps of: video image acquisition and behavior characteristic extraction. The movement human abnormal behavior identification method is a mode identification technology based on statistical learning of samples. The movement of a human is analyzed and comprehended by using a computer vision technology, the behavior identification is directly carried out based on geometric calculation of a movement region and recording and alarming are carried out; the Gaussian filtering denoising and the neighborhood denoising are combined for realizing the denoising, thereby improving the independent analysis property and the intelligent monitoring capacity of an intelligent monitoring system, achieving higher identification accuracy for abnormal behaviors, effectively removing the complex background and the noise of a vision acquired image, and improving the efficiency and the robustness of the detection algorithm. The invention has simple modeling, simple algorithm and accurate detection, can be widely applied to occasions of banks, museums and the like, and is also helpful to improve the safety monitoring level of public occasions.

In one solution, a method and apparatus are disclosed for modeling patterns of behavior of humans or other animate objects and detecting a violation of a repetitive pattern of behavior. The behavior of one or more persons is observed over time and features of the behavior are recorded in a multi-dimensional space. Over time, the multi-dimensional data provides an indication of patterns of human behavior. Activities that are repetitive in terms of time, location and activity, such as sleeping and eating, would appear as a Gaussian distribution or cluster in the multi-dimensional data. Probability distribution functions can be analyzed using known Gaussian or clustering techniques to identify repetitive patterns of behavior and characteristics thereof, such as a mean and variance. Deviations from repetitive patterns of behavior can be detected and an alarm can be triggered, if appropriate.

In another solution, a system and method is disclosed for monitoring human interactions, including transactions and communications, profiling the subject and objects in those interactions, and comparing subject profiles to profiles of subjects with known characteristics to determine whether the test subject is normal or abnormal subjects. The behavior data can be collected electronically in a virtual environment, such as a website, through video surveillance, card access, phone records, purchase

histories, or any other consistent identified record of behavior. The invention has application in detecting various types of unusual and malicious activity, including spam, viruses, terrorism, identity theft, and money laundering, to name but a few applications.

The existing systems don't work in crowded places. In addition of, the existing systems don't have feature of face reading of a person, which are required to be improved. Further, the existing systems don't monitors unusual behavior of person. Therefore, there exists a need to have a better video surveillance for security issues.

SUMMARY OF THE INVENTION

The present invention generally relates to security system and computer vision system and in particularly relates to detecting thief that based on human structure and expression identification.

In an embodiment, a method for theft detection based on human structure and expression identification using video surveillance is provided. The method includes the steps of: recording surrounding activities using a video surveillance system; converting video stream captured by said video surveillance system into plurality of images; extracting human silhouette from an image using segmentation techniques to obtain human skeleton; recognizing face in said human silhouette to check, whether face is covered or uncovered; recognizing facial expression for usual and unusual behaviour of human based on scene in a video; and detecting target Object based on said recognition.

In another embodiment, a system for theft detection based on human structure and expression identification using video surveillance is provided. The system includes the steps of: a video surveillance system for recording surrounding activities; an image processing unit for converting video stream captured by said video surveillance system into plurality of images; a human silhouette processing unit for extracting human silhouette from an image using segmentation techniques to obtain human skeleton; a face recognition unit for recognizing face in said human silhouette to check, whether face is covered or uncovered; a facial recognition unit for recognizing facial expression for usual and unusual behavior of human based on scene in a video; and an object detecting unit for detecting target object based on said recognition.

An object of the present invention is to provide system that monitors unusual human behavior of a person.

Another object of the present invention is to provide system that recognizes facial expression of thief.

Another object of the present invention is to provide intelligent system that detects the thief in crowded areas.

To further clarify advantages and features of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof, which is illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail with the accompanying drawings.

BRIEF DESCRIPTION OF FIGURES

These and other features, aspects, and advantages of the present invention will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

Figure 1 shows a flowchart of a method for theft detection based on human structure and expression identification using video surveillance in accordance with an embodiment of the present invention;

Figure 2 shows a block diagram of a system for theft detection based on human structure and expression identification using video surveillance in accordance with an embodiment of the present invention by implementing the method illustrated in Figure.1;

Figure 3 shows a block diagram of proposed methodology of system in accordance with an embodiment of the present invention;

Figure 4 shows a block diagram of working module in accordance with the present invention;

Figure 5 shows a schematic block diagram illustrating hardware structure of an image processing apparatus according to an example embodiment of the present invention;

Further, skilled artisans will appreciate that elements in the drawings are illustrated for simplicity and may not have been necessarily been drawn to scale. For example, the flow charts illustrate the method in terms of the most prominent steps involved to help to improve understanding of aspects of the present invention. Furthermore, in terms of the construction of the device, one or more components of the device may have been represented in the drawings by conventional symbols, and the drawings may show only those specific details that are pertinent to understanding the embodiments of the present invention so as not to obscure the drawings with details that will be readily apparent to those of ordinary skill in the art having benefit of the description herein.

DETAILED DESCRIPTION:

For the purpose of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated system, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

It will be understood by those skilled in the art that the foregoing general description and the following detailed description are exemplary and explanatory of the invention and are not intended to be restrictive thereof.

Reference throughout this specification to “an aspect”, “another aspect” or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrase “in an embodiment”, “in another embodiment” and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

The terms "comprises", "comprising", or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a process or method that comprises a list of steps does not include only those steps but may include other steps not expressly listed or inherent to such process or method. Similarly, one or more devices or sub-systems or elements or structures or components proceeded by "comprises...a" does not, without more constraints, preclude the existence of other devices or other sub-systems or other elements or other structures or other components or additional devices or additional sub-systems or additional elements or additional structures or additional components.

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. The system, methods, and examples provided herein are illustrative only and not intended to be limiting.

Embodiments of the present invention will be described below in detail with reference to the accompanying drawings.

The present invention generally relates to security system and computer vision system and in particularly relates to detecting thief that based on human structure and expression identification.

Figure 1 illustrates a flowchart for a method for theft detection based on human structure and expression identification using video surveillance. The method 100 includes the steps of: Step 102 of recording surrounding activities using a video surveillance system; Step 104 of converting video stream captured by said video surveillance system into plurality of images; Step 106 of extracting human silhouette from an image using segmentation techniques to obtain human skeleton; Step 108 of recognizing face in said human silhouette to check, whether face is covered or uncovered; Step 110 of recognizing facial expression for usual and unusual behaviour of human based on scene in a video; and Step 112 of detecting target Object based on said recognition.

In an embodiment, the expressions are identified using Feature Extraction if Face is Uncovered, Expressions are identified using Feature Extraction.

In an embodiment, if Face is covered, identification is done by considering the Movements of Human Silhouette.

In an embodiment, the method 100 further includes of extracting a particular object in an image.

In an embodiment, the method 100 further includes of raising an alert on recognizing unusual behavior.

In an embodiment, the alert is raised in the form of a sound alarm or a visual alarm.

In an embodiment, the method 100 further includes of transmitting a message in the form of an SMS on recognizing unusual behavior.

Referring to **Figure 2**, a system for theft detection based on human structure and expression identification using video surveillance using the method implemented in Figure 1 is illustrated. The system 200 includes a video surveillance system 202 for recording surrounding activities; an image processing unit 204 for converting video stream captured by said video surveillance system into plurality of images; a human silhouette processing unit 206 for extracting human silhouette from an image using segmentation techniques to obtain human skeleton; a face recognition unit 208 for recognizing face in said human silhouette to check, whether face is covered or uncovered; a facial recognition unit 210 for recognizing facial expression for usual and unusual behavior of human based on scene in a video; and an object detecting unit 212 for detecting target object based on said recognition.

In an embodiment, the video surveillance system is configured to capture still images and video streams.

Figure 3 shows a block diagram of proposed methodology of system in accordance with an embodiment of the present invention. All crowded areas are covered by video cameras. Video surveillance is set to record/monitor the surrounding activities. Through the video surveillance, system extracts the human data of every person in surrounding environment. Video is converted into images for further process. Preprocessing methods will be used for extraction of particular object in an image. Video is converted into set of images. The images show the activity and behavior of every person in a short interval of time. Human Silhouette is extracted from an image using segmentation methods to obtain human skeleton as an output for the system. After getting human silhouette, system checks the face of

person, whether it is covered or not. If face is uncovered, Expressions are identified using Feature Extraction. Facial Expression for usual and unusual behaviour of human is recognized based on scene in a video. If system finds any irregularity in the expression or behavior of a person then system continuously gets focused on that person and monitors every activity of a person. If system gets all the action which is likely to be same as pre stored action then system detects the target and raised the alarm.

And if face is covered, Identification is done by considering the Movements of Human Silhouette. System gives focus on the covered face person and continuously monitors the hand movement of the person. After that system monitors the all objects that present nearby that person. If system finds any objects that irregular with the surroundings then system identifies the target and raises the alarm.

Figure 4 shows a block diagram of working module in accordance with the present invention. Working module has three units i.e. database unit, processing unit and notification unit. Data unit is the primary unit of the working module. Data unit has three parts i.e. video surveillance, server and frame work. Data unit is considered as a database and back-end of a system. The first part of drive unit i.e. video surveillance that provides input to the system in the form of video. It is hardware of a system. Server is a database of a system and provides processing facility on network. Frames are used for framing algorithm is applied to divide the video(s) into multiple frames.

Processing unit is backbone of the system. Processing unit has many parts i.e. human identification, raspberry pai, face detection, body moments identification and theft detection. For identify the human, algorithms are applied to extract a human from a frame, which is input to the system. Raspberry Pai acts as hardware for a system, which is being designed and a facial expression algorithm is deployed over it. For detection the face of a person, algorithms are applied to identify an unusual facial expression using feature extraction with help of Raspberry Pai. For identify the body moments, algorithms are applied to identify a suspicious moments of human body parts. And detection of thief is the final result of the processing unit.

Notification unit is the front-end of a system. Notification unit has two components i.e. alarm system and mobile application. In alarm system, user is notified with hazardous event in indoor or outdoor environment. Suspicious event are communicated to user via mobile network.

Referring to **figure 5**, a hardware structure 500 of the image processing apparatus 502 is explained according to an example embodiment of the present invention. In this example, the image

processing apparatus 502 is implemented by a MFP that is capable of performing various types of processing including, for example, scanning operation of scanning an original document into scanned image data; copying operation of printing the scanned image data onto a recording sheet to output a printed sheet; distribution operation of distributing image data through a network such as a local area network; and facsimile transmission operation of transmitting image data via facsimile. The image processing apparatus 502 includes a processor, a volatile memory such as a random access memory (RAM), and nonvolatile memory such as a hard disk drive (HDD) and ROM. Under control of an operating system (OS) such as UNIX or LINUX, the processor loads an image processing program from the HDD or ROM onto the RAM to cause the image processing apparatus 502 to perform image processing operation according to the image processing program. The image processing program may be written in any desired programming language such as assembler, C, C++, JAVA, Java, Script, etc.

The image processing apparatus 502 of Figure 5 mainly includes a controller 504, an operation panel 520, a converter 522, a facsimile control unit (FCU) 524, and an engine 526.
The controller 504 controls entire processing performed by the image processing apparatus 502. The controller 504 includes a central processing unit (CPU) 506, an application specific integrated circuit (ASIC) 508, an image data buffer 510, a secondary storage 512, a read only memory (ROM) 514, and a network interface (I/F) 516.

The CPU 506 is a processor that controls processing performed by the image processing apparatus 502. For example, the CPU 506 deploys a control program such as the image processing program stored in the ROM 514 onto the RAM to perform various processing including the image processing operation that will be described below.

The ASIC 508 is an integrated circuit that performs scanning of the original document, distribution of image data, and printing of image data, for example. When the ASIC 508 receives a processing request that requests execution of various processing, which is instructed by a user through the operation panel 520, the ASIC 508 causes any one of the converter 522, FCU 524, and engine 526 to perform the requested processing, by transmitting a control signal through a peripheral component interconnect (PCI) bus 518. In this example, the ASIC 508 is assumed to perform various processing through at least one of the converter 522, FCU 524, and engine 526. Alternatively, the ASIC 508 may deploy specific programs onto the RAM to execute various processing according to the processing request.

The image data buffer 510 is a data buffer that temporarily stores image data to be processed. The image data buffer 510 may be implemented by a volatile memory such as RAM, for example. In this example, the image data that is generated by scanning the original document, which may be referred to as the scanned image data, is stored in the secondary storage 512 through the image data buffer 510. The scanned image data, which is read out from the secondary storage 512, is converted so as to have a specific format to generate converted image data. The converted image data, which is generated by the converter 522, is buffered into the image data buffer 510 and stored in the secondary storage 512, on a first-in first-out (FIFO) basis. The ASIC 508 performs various processing using the converted image data such as printing, facsimile transmission, or network distribution.

The secondary storage 512 is a storage device that stores the scanned image data and the converted image data. The secondary storage 512 may be alternatively referred to as a supplementary storage. When storing the scanned image data or the converted image data, the ASIC 508 generates identification information ("image data identification information") that is unique to the image data being stored, in the form of metadata that is associated with the image data being stored. The ASIC 508 uses this image data identification information to obtain, from the secondary storage 512, the scanned image data or the converted image data that matches the process requested by the processing request. In this example, the secondary storage 512 may be implemented by a nonvolatile memory such as a HDD or flash memory.

The network I/F 516 functions as an interface with the outside network such as a LAN network or the Internet. The network I/F 516 transmits the converted image data to the outside network according to an instruction received from the ASIC 508. The network I/F 516 may receive various data such as data to be printed from the outside network, for example, from an information processing apparatus that generates the data to be printed.

The operation panel 520 allows the user to select, from various processing that can be provided by the image processing apparatus 502, one or more processing to cause the image processing apparatus 502 to perform the selected processing. The operation panel 520 displays thereon processing that can be provided by the image processing apparatus 502. Upon selection of specific processing and settings information that further specifies how the selected processing is to be performed by the user, one or more processing requests each requesting execution of selected processing are transmitted to the

ASIC 508 together with information regarding a type of the selected processing and settings information. In this example, the operation panel 520 is implemented by a touch panel screen.

More specifically, the operation panel 520 displays thereon a plurality of buttons or keys, which may be collectively referred to as keys. The keys include a key for instructing copying of the original document, a key for instructing facsimile transmission of image data of the original document, a key for instructing network distribution of image data of the original document, etc. When the key for copying is selected, the user is able to select or specify a number of pages to be copied, a color of the printed image being output, a recording sheet size, image quality of the printed image, encoding format of image data, enlarged size ratio, reduction size ratio, etc., as settings information for copying. When the key for facsimile transmission is selected, the user is able to select or specify a telephone number to which facsimile data is sent, image quality of facsimile data, encoding format of facsimile data, re-transmission option indicating whether to re-transmit in case of error, etc., as settings information for facsimile transmission. When the key for network distribution is selected, a file path or an email address that identifies a destination to which image data is sent, encoding format of image data, etc., as settings information for network distribution.

The operation panel 520 further requests the user to select whether to store image data being processed, when a plurality of processing requests are to be sequentially performed. In one example, the operation panel 520 may provide a check box that can be selected or unselected by the user. In another example, the operation panel 520 may be caused to display a message that asks the user whether to store image data, only when more than one processing requests are instructed.

In alternative to instructing processing to be performed through the operation panel 520, the user may instruct the image processing apparatus 502 to perform specific processing by sending one or more processing requests through the information processing apparatus via the network. In such case, the processing request received at the network I/F 516 is sent to the ASIC 508 for further processing.

For the descriptive purposes, in this example, any one of the operation panel 520and the network interface 516 may be collectively referred to as a user interface that provides the function of receiving one or more processing requests from the user.

The converter 522 converts a data format of the scanned image data of the original document to generate converted image data having a data format that matches the requested processing, according to an instruction received from the ASIC 508. In this example, the converter 522 is implemented by an ASIC that is specially designed for data conversion. Alternatively, the functions of the converter 522 may be at least partially performed by a data conversion program. In this example illustrated in FIG. 1, the converter 522 is provided independently from the controller 504. Alternatively, the controller 504 may incorporate therein the converter 522.

The FCU 524 transmits image data of the original document via facsimile. The FCU 524 transmits the converted image data that is generated by the converter 522through a telephone network, according to an instruction received from the ASIC 508.

The engine 526 provides functions of scanning the original document or printing image data of the original document. The engine 526 includes an ASIC 528, scanner 530, and printer 532.

The ASIC 528 is an integrated circuit that performs various processing such as scanning of the original document or printing of image data of the original document. For example, according to an instruction received from the controller 504, the ASIC 528 causes the scanner 530 to scan the original document into scanned image data or causes the printer 532 to print the scanned image data on a recording sheet. Alternatively, any of the functions provided by the ASIC 528 may be performed by a control program that is deployed onto the RAM.

The scanner 530 scans the original document into scanned image data. The scanner 530, which is implemented by any desired scanner, includes an optical system and a charged coupled device (CCD) sensor, for example. According to an instruction for scanning that is received from the ASIC 528, the scanner 530 scans light toward the original document surface to form an optical image on the CCD sensor. The CCD sensor converts the optical image formed thereon to an electrical signal. The scanner 530 further applies image processing such as analog-to-digital conversion to the electrical signal to generate scanned image data. The scanned image data may be further applied with correction processing such as gamma correction. The scanner 530 outputs the scanned image data to the controller 504through the PCI bus 518.

The printer 532 prints image data of the original document, which is obtained by converting the scanned image data, onto a recording sheet. According to an instruction received from the ASIC 528, the printer 532 prints the image data onto the recording sheet based on settings information included in the processing request input by the user through the operation panel 520. In case of copying, the printer 532 obtains the scanned image data generated by the scanner 530 and stored in the secondary storage 512, and prints the scanned image data onto the recording sheet. In case of printing, the printer 532 obtains image data to be printed from the network through network I/F 516, and prints the image data onto the recording sheet.

The drawings and the forgoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, orders of processes described herein may be changed and are not limited to the manner described herein. Moreover, the actions of any flow diagram need not be implemented in the order shown; nor do all of the acts necessarily need to be performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples. Numerous variations, whether explicitly given in the specification or not, such as differences in structure, dimension, and use of material, are possible. The scope of embodiments is at least as broad as given by the following claims.

Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any component(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature or component of any or all the claims.

We claim:

1. A method for theft detection based on human structure and expression identification using video surveillance, said method comprising the steps of:
    a. recording surrounding activities using a video surveillance system;
    b. converting video stream captured by said video surveillance system into plurality of images;
    c. extracting human silhouette from an image using segmentation techniques to obtain human skeleton;
    d. recognizing face in said human silhouette to check, whether face is covered or uncovered;
    e. recognizing facial expression for usual and unusual behaviour of human based on scene in a video; and
    f. detecting target Object based on said recognition.

2. The method as claimed in claim 1, wherein expressions are identified using Feature Extraction if Face is Uncovered, Expressions are identified using Feature Extraction.

3. The method as claimed in claim 1, wherein if Face is Covered, identification is done by considering the Movements of Human Silhouette.

4. The method as claimed in claim 1 further comprising extracting a particular object in an image.

5. The method as claimed in claim 1 further comprising raising an alert on recognizing unusual behavior.

6. The method as claimed in claim 3, wherein alert is raised in the form of a sound alarm or a visual alarm.

7. The method as claimed in claim 1 further comprising transmitting a message in the form of an SMS on recognizing unusual behavior.

8. A system for theft detection based on human structure and expression identification using video surveillance, said system comprising the steps of:
    a. a video surveillance system for recording surrounding activities;

b. an image processing unit for converting video stream captured by said video surveillance system into plurality of images;
c. a human silhouetteprocessing unit for extracting human silhouette from an image using segmentation techniques to obtain human skeleton;
d. a face recognition unit for recognizing face in said human silhouette to check, whether face is covered or uncovered;
e. a facial recognition unit for recognizing facial expression for usual and unusual behavior of human based on scene in a video; and
f. an object detecting unit for detecting target object based on said recognition.

9. The system as claimed in claim 8, wherein said video surveillance system is configured to capture still images and video streams.

Dated this the 4th day of April, 2019

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ABSTRACT

AN AUTOMATED SYSTEM FOR THEFT DETECTION BASED ON HUMAN STRUCTURE AND EXPRESSION IDENTIFICATION USING VIDEO SURVEILLANCE

The present invention generally relates to security system and computer vision system and in particularly relates to detecting thief that based on human structure and expression identification. A method and system for theft detection based on human structure and expression identification using video surveillance is provided. The method includes the steps of: recording surrounding activities using a video surveillance system; converting video stream captured by said video surveillance system into plurality of images; extracting human silhouette from an image using segmentation techniques to obtain human skeleton; recognizing face in said human silhouette to check, whether face is covered or uncovered; recognizing facial expression for usual and unusual behaviour of human based on scene in a video; and detecting target Object based on said recognition.