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Smart Web Cam Motion Detection Surveillance System

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***Abstract**: The Basic Idea Behind "Smart Web Cam Motion Detection Surveillance System" Is To Stop The Intruder To Getting Into The Place Where A High End Security Is Required. This Paper Proposes A Method For Detecting The Motion Of A Particular Object Being Observed. The Motion Tracking Surveillance Has Gained A Lot Of Interests Over Past Few Years. This System Is Brought Into Effect Providing Relief To The Normal Video Surveillance System Which Offers Time-Consuming Reviewing Process. Through The Study And Evaluation Of Products, We Propose A Motion Tracking Surveillance System Consisting Of Its Method For Motion Detection And Its Own Graphic User Interface. Various Methods Are Used In Motion Detection Of A Particular Interest. Each Algorithm Is Found Efficient In One Way. But There Exits Some Limitation In Each Of Them. In Our Proposed System Those Disadvantages Are Omitted And Combining The Usage Of Best Method We Are Creating A New Motion Detection Algorithm For Our Proposed Motion Tracking Surveillance System. The Proposed System In This Paper Does Not Have Its Effect Usage In Office Alone. It Also Offers More Convenient, Effective And Efficient Usage Where High-End Security Comes Into Picture.*

***Keywords:** Intrusion, Motion Detector, Security, Surveillance, Web Camera.*

I. INTRODUCTION

The Theft Statistics Show That Out Of The Total Reported Thefts, The Breakage Can Be Shown :-Display Cases: 19%,Open Displays: 10%, Pictures: 04%,Other Displays: 02%,At Night: 06%,From Stores: 02%,Other: 03%.Although We Are Successful In Detecting And Gaining Evidence Against The Crimes, We Have To Find A Way Of Preventing Them Too. Stopping Thefts And Crimes While They Are In Progress Is The Main Motivation Of Our Paper. Motion Can Be Detected By Measuring Change In Speed And Vector Of An Object Or Objects In The Field Of View. This Can Be Achieved Either By Mechanical Devices That Physically Interact With The Field Or By Electronic Devices That Quantifies And Measures Changes In The Given Environment. Motion Detection Refers To The Capability Of The Surveillance System To Detect Motion And Capture The Events. Motion Detection Is Usually A Software-Based Monitoring Algorithm Which, When It Detects Motions Will Signal The Surveillance Camera To Begin Capturing The Event. This Paper Proposes That The Motion Detection System Which We Have Built Has Various Benefits In Terms Of Cost And Complexity. Our System Basically Consists Of The Webcam Which Is In-Built On The Computer System. The Webcam Thus Significantly Reduces The Cost Of The Overall System. On Detection Of Any Kind Of Malicious Activity The System Will Capture The Image Immediately And Send Notification To The Administrator In The Form Of Image (Mms) And E-Mail. Also At The Same Time The Alarm Will Be Set Off Signaling The Occurrence Of The Ongoing Illegal Activity, Which Can Also Have Benefit Of Causing Momentary Panic Among The Robbers And Alert The Concern Authorities Via Mms/E-Mail. The System Is Designed To Capture The Effects Of Light Sensitivity. In Case Of Sudden Changes In The Light The System Will Capture The Image And Set Off The Alarm. In Summary, The Contribution Of This Paper Is Tonot Only Detect The Ongoing Intrusion But Also To Stop It While It Is In Progress.

The Paper Is Organized As Follows. A Brief Introduction Followed By The Overall Study Of Existing Systems And Requirements Of The Surveillance Are Depicted In Section 2work Specification Of Motion Detection Is Presented In Section 3, Followed By The Work Implementation In Section 4.

II. RELATED WORK

A Number Of Approaches And Systems Have Been Proposed And Designed In Recent Years To Identify And Analyze Malicious Activity [6]. We Will Now Briefly Present The Most Relevant Ones And Compare Them With Our Approach.

VIDEO MOTION DETECTORS-OUTDOOR APPLICATIONS		LIST RICE USD
DS-16	A chassis which holds up to 16 channels of the dS-1S or dS-1SPL pCBS. The active backplane controls all Pcbs from front panel programming or rS-232.	1395.00
DS-16-MT	A chassis which holds up to 16 channels of the DS-1SPL Pcbs. The active backplane controls all Pcbs from front panel programming or RS-232	2096.00
DS-1	1channel motion detector, 262,144 detection points, day/night mode, video loss alarm and RS-232.	1595.00

VIDEO MOTION DETECTORS-INDOOR APPLICATIONS		List
VMD-2004	4-channels vMD-262,144 detection points, independent zone blocking, video loss, built-in alarming, bridging, looping switcher. 12VDC with included adapter.	1295.00
VMD-2008	8-channels VMD-262,144 detection points, independent zone blocking, video loss, built-in alarming, bridging, looping switcher. 12VDC with included adapter.	1995.00

LOW COST VIDEO MOTION DETECTOR		List
VMD-1001	1-channel Vmd, 62, 208 detection points, multi-zone areas, front panel push button operation, on screen menus, suitable for indoor and outdoor applications.	595.00
VMD-1001S	vmd-1001 pcb Only	590.00

Now the estimated cost of the existing systems will include the cost of various hardware equipment's that the system requires supporting it. Even the lowest cost motion detectors' which are currently available in the market are far more expensive then the system we have built.

III. WORK SPECIFICATION

In our project we have aimed to build such asurveillance system, which can not only detect motion, but will

A) Warn the User of the Intrusion by Setting on the Alarm,
B) Record the Footage from the Moment the Motion Was Detected,
C) Sends an E-Mail to the Logged In User And
D) Sends Mms On The Mobile Phone Of The User.

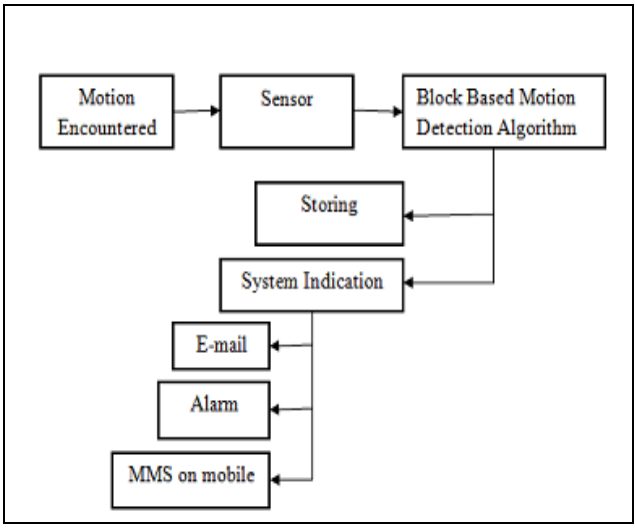

Figure 1: A Basic System Architecture of Our System

System Architecture Functioning

The system architecture is going to function in following way:

3.1capturing Phase

To detect Motion We First Have To Capture Live Images Of the Area to Be Monitored and Kept under Surveillance. This Is Done by Using a Web Cam which continuously provides A Sequence of Images in a Particular Speed of Fps (Frames per Second).

3.2comparing Phase

Comparing the Current Frames Captured with Previous Frames to Detect Motion: For Checking Whether Any motion Is Present in the Live Images, We Compare The live Images Being Provided By The Web Cam With each Other So That We Can Detect Changes In These Frames and Hence Predict The Occurrence Of Some Motion.

3.3storage Phase

Storing The Frames On The Memory If Motion Is Detected: If Motion Is Being Detected, We Would Require Storing such Motion So That The User Can View It In The Near Future. This Also Helps the User in Providing a Legal Proof of Some inappropriate Activity since a Video Coverage Can Be Used as A Proof in the Court Of Law.

3.4system Indication Phase

Indicating through an E-Mail, Alarm and Mms When the Motion Is Detected: The User May Want To Be Notified Immediately That There has Been Some Intrusion Detected By The Software, Hence an Alarm System Is Included In The Software. This Alarm system immediately activates a Wav File Format Audio alarm Signal If Any Kind Of Motion Is Detected Hence. This helps In Preventing Any Kind Of Breach of Security at That moment Of Time. As Soon As The Motion Is Detected An E-Mail Containing The Pictures Of The Intruder Are Sent To The Mail Account Of The User And Simultaneously An Mms Will Be Delivered On The User's Cell Phone.

IV. IMPLEMENTATION

4.1background AND Foreground Separation

The Discrimination between Background and foreground Is Based On Block-Based motion Estimation. In This Paper, The Modified Block-Based Estimator Is Used To Track Changes Of The Individual Block. Each Frame of The 320x240 Pixel Resolution Is Divided Into Non-Overlapping Of 32x24 Pixels. For The Block Motion Estimation, A 9x9 Window Region With The Maximum Standard Deviation Is Extracted Within Each Block [1].

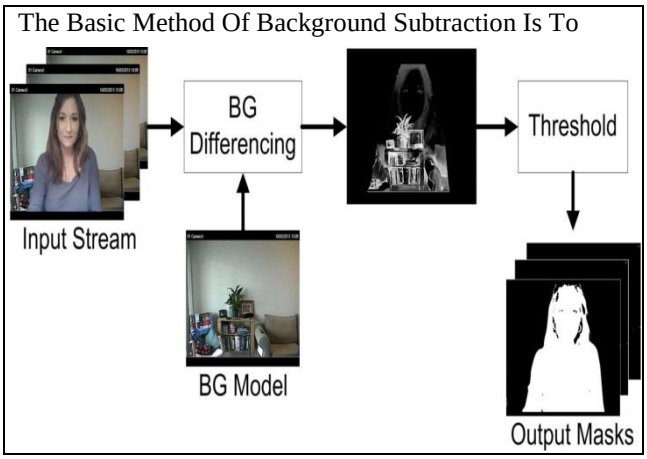

Figure 2: Background Separation

In the above figure, an input stream of images will be provided to the system which is then subject to background separation. Subtraction takes place based on the predefined threshold value and resultant is the foreground image which we obtain.

V. conclusion

The "smartweb cam motion detection surveillance system" is a Home/Office based security system which can be of great where security is a matter of concern. The Motion Detector patches up for the need of a cheap and small security system in day-to-day life. Computerized Home-based security can develop a lot with the coming future. Future is promising and easier with innovative technologies.

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