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# Hawkeye Security: We Guard, We Protect, We Secure.

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**Abstract** –*This research is regarding mobilizing change in the field of security surveillance. This change will help yielding enhanced controls via security devices which currently although serve the purpose of security surveillance, however do not provide the same fennesse that is required for the desired output. Our project is aimed at connecting these missing DOTS and enhancing the overall productivity of such devices by strategic functional remodeling which will encompass the basic as well as the advanced functionality of Surveillance cameras*

***Key Words***: Mobilizing Change, Security Surveillance cameras, Tensorflow, OpenCV, valuable assets, alarm sensors.

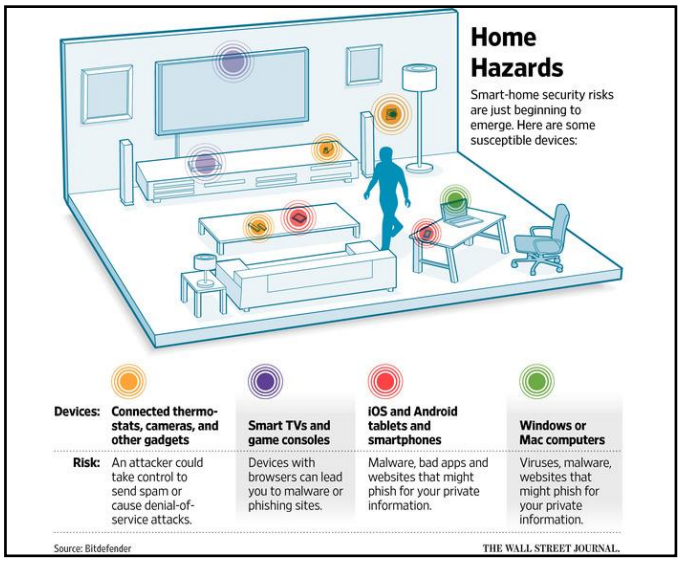
## 1. INTRODUCTION

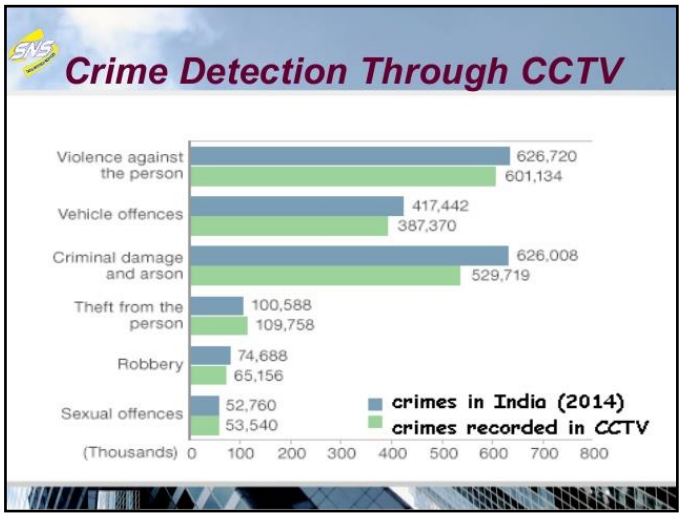
The increased awareness on global security has led to the origin of trans-rational gadgets such as CCTV cameras, intercoms, etc. However the utility of these gadgets solely depends on the benefit ratio that encompasses the overall requirement for their usage. One such gadget is 'SECURITY SURVEILLANCE' which serves as a catalyst enhancing the utilities of CCTV cameras thereby working as a constitutive indicator in case of any security breach. Here are few of the benefits outlined as follows:

1. The sensor gets triggered as soon as any device/object is non visible from the cameras monitoring the object.
2. This trigger leads to an alarm alerting the owner of the object about the security breach, thereby assisting in timely remediation to avoid further loss
3. Another added benefit of this sensor is to re-iterate the proper functioning of cameras.

## 1.1 AIM AND OBJECTIVE

The main aim of this project is to aid the business companies and local shop owners to easily keep a track of their valuable assets. It helps the users to continuously track their artefacts and avoid theft or loss. Also these cameras will have the ability of capturing facial image if the object is being mis-handled or tampered.




## 1.2 PROBLEM STATEMENT

There are two predominant concerns in the field of Security Surveillance – 1. Real time artifacts capture, 2. Tactical and Strategic solutioning. Our project, Security Surveillance provides enough substantiation of covering both these aspects. This project encompasses safety and security of artifacts from theft which being the main essence of Security Surveillance. There are various options in this industry offering good security cameras, however there is enormous provision of improvisation in some key areas. Generally, when a camera's vision gets obstructed, the main purpose is diluted. This being the starting point of our research to provide adequate solutioning by adding

sensory alarms to the device which will enhance the productivity of these cameras. Additionally, this productivity can further be augmented by creating synergies between two different devices, where at least two cameras can watch the artifact by syncing both of them. The alarm in the cameras will only be triggered when both the cameras have lost their vision from the artifact. This way the security could be alerted real time to avoid any breach. We have to be cognizant of the complexity of the system to avoid the only complication with this project by ensuring that the placement of the devise is planted in a way which is devoid of all obstructions from other objects to ensure a clear and crisp vision on the artifact.

## 2. RELATED WORKS

### 2. 1 ADVANCED COVERAGE

Where once pixilation was the end-all-be-all of a camera's "high-tech-ness," the buzz these days is all about how far cameras can see in different directions. Many cameras these days now tout 130-degree views, which allow for fairly comprehensive coverage of a room when placed in a corner. But if you really want to take things up a notch, consider the 360-degree field of view promised by the likes of Sentry 360 Security Inc. and German company Mobotix.

### 2. 2 FACIAL RECOGNITION

It's a bit creepy and dystopian, sure, but **Netamo Welcome** has ushered in a new era of security camera tech with its facial recognition feature, which allows the camera to identify members of the camera owner's household and send out personalized updates when they arrive home.

The feature is proving popular among parents of latchkey kids, who derive peace of mind from knowing their kids have arrived home safely. But the camera doesn't just recognize familiar faces, it also notifies users if a stranger attempts to enter the home.

## 3. METHODS

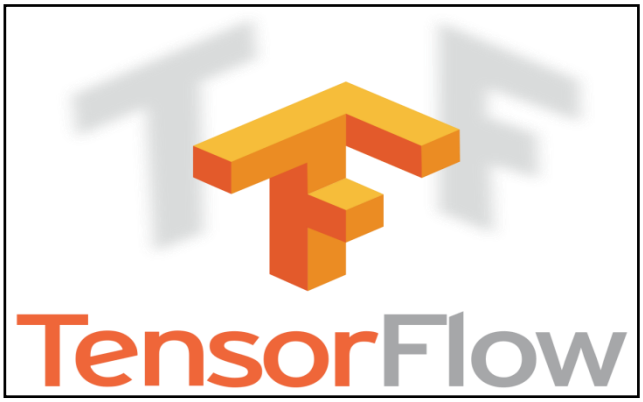
This project **"Hawk Eye Security"** is developed using multiple approach as follows –

**3.1. YOLO V2:** 'YOU ONLY LOOK ONCE'. In terms of speed, YOLO is one of the best models in object recognition, able to recognize objects and process frames at the rate up to 150 FPS for small networks. YOLO sees the entire image during training and test time so it implicitly encodes contextual information about classes as well as their appearance. YOLO learns generalizable representations of objects so that when trained on natural images and tested on artwork, the algorithm outperforms other top detection methods.

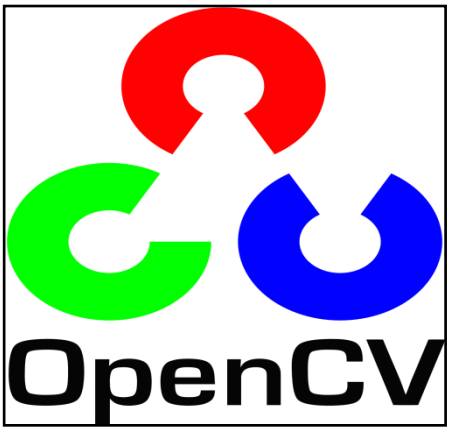
**3.2. WEBCAM:** A webcam is a compact digital camera you can hook up to your computer to broadcast video images in real time (as they happen).

**3.3. Graphics enabled with CUDA:** CUDA (Compute Unified Device Architecture) is a parallel computing platform and application programming interface (API) model created by Nvidia. It allows software developers and software engineers to use a CUDAenabled graphics processing unit (GPU).

**3.4 Tensor Flow:** TensorFlow is a free and open-source software library for machine learning. It can be used across a range of tasks but has a particular focus on training and inference of deep neural networks.




**3.5 OpenCV:** OpenCV is a library of programming functions mainly aimed at real-time computer vision. Originally developed by Intel, it was later supported by Willow Garage then Itseez. The library is cross-platform and free for use under the open-source Apache 2 License.




## 4. EVALUATION

Testing's such as Unit testing, Integration testing, Load and Stress testing were performed on the prototype. Some improvements regarding data management and faster

response rate were suggested by the testing team. These updates will be done in the next version upgradation, and after Acceptance testing the prototype will be available for end user utility.

## 5. FUTURE SCOPE

This project will help in strengthening security surveillance, yielding enhanced assistance to the local shop owners and business community in boosting their security framework. Additionally, this will also have an academic penetration and aide the students in their projects and curriculum activities. The Security market is a large scale phenomenon both in India as well as overseas. As per the latest bulletin from India Buzz, the Indian video surveillance market is projected to grow at a CAGR of over 10.5 per cent between 2018-24. The global video surveillance market is expected to grow from US$ 45.5 billion in 2020 to US$ 74.6 billion by 2025, at a CAGR of 10.4 per cent. Keeping this in focus, our Hawk Eye Security will enjoy a considerable amount of market capture owing to its enhance benefits.

## 6. CONCLUSIONS

The prototype of our Hawk Eye Security was developed successfully. The major objectives covered by our application are as follows:-

- Our Software, HAWKEYE SECURITY is a simple system with which users can safeguard their valuable assets.
- Our CCTV cameras equipped with alarm sensors can be hugely benefitted to our users.
- Security surveillance which used to have human supervision 24x7 can now be automated with our software.

## ACKNOWLEDGEMENT

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