

# SMART AI SECURITY GUARD

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**Abstract :** Artificial Intelligence is the technology which has introduced a new era of civilization to the world by amplifying the human intelligence with that of artificial intelligence. Smart security camera can be one of the wonders of modern technology. In this paper we propose a methodology using AI CCTV camera which will prevent and detect the advent of crime. It can be an effective security measure which performs facial recognition and also detects suspicious anomalies. This AI camera has many features which can be programmed as per the requirements of the users. The programming is made much more simpler making use of Deep learning studio which is a drag and drop platform that builds the model as per the features which have been dropped. We try to train the model such that it detects the violence and burglar trying to steal or damage the assets.

**IndexTerms -** Machine learning, Artificial intelligence, Deep learning studio, AI CCTV cameras.

## I. INTRODUCTION

In this era of Artificial Intelligence and IOT humans are replaced by Robots and machines which performs the tasks of a human with ease and accuracy. The intelligent creation of the devices which react similar to that of humans is the technology of artificial intelligence. The main aim of artificial intelligence is the creation of intelligent devices. The AI devices have been designed to perform the activities like Speech recognition, Problem solving, Planning, Learning etc. The important aspect that runs behind every AI device is the Data or information. Any Ai device can react like human unless and until it has enough information about the task which it is acting on. So, knowledge is core part in Artificial Intelligence. Now-a-days AI is found everywhere like say from Siri and Cortana to self-driving cars, economics and law to security and control. AI systems does whatever you want them to do from controlling your car, schedule meetings for you, buy things for you. AI is such a super intelligent technology which can also prevent the wars, eradicate diseases, remove poverty and also prevent crimes. AI's impact on society benefits, motivates its research in almost all the fields and research areas.

In the places like Shopping malls, Offices, Industries, warehouses, tourism spots and even homes we find a security guard who safeguards and prevents the advent of crimes and protects the assets. Here the person hired for this task is usually a skilled person who can defend the criminals and protect the people and their valuable assets. But this a tedious task if the area is a crowded place and surrounding large area. Let us consider a Residential building which has two or more entrances and have only two security guards hired. Now-a-days criminals go to great lengths to accomplish their tasks and in the above case it becomes more easier to rob or perform violence. Most of the crimes these days take place in the broad daylight. These places are also equipped with the CCTV cameras for video surveillance as well. But these cameras only help the authorities to investigate the crime which has already taken place and cannot help in preventing the crime. For this purpose, we make use of the CCTV cameras with AI technology. These cameras are designed in such a way that they capture the images of everything which obstructs its vision. These cameras run facial recognition, detect the anomalies in crowded venues and report the details to the specified authorities and the help in preventing the adverse conditions.

The advances in this technology of CCTV are advanced object motion detection and in-depth behavioral analysis. In this context we propose TensorCam which is an AI CCTV Camera which can perform 24 trillion operations per second. The user can customize these operations as per his requirements. Some of the features are Scene understanding, Alexa integrated, AI enabled, Computing performance, DLS support, Full HD, Live streaming, Night vision etc. By using this TensorCam we can build applications like Object detection, Shelf Monitoring, Activity recognition, Face detection, Smart surveillance at door entrance. For customizing the features on TensorCam we need Deep Learning Studio.

## II. LITERATURE REVIEW

Artificial intelligence is enhancing rapidly in today's world. The prevalent use of AI technology can bring us productivity and handiness. We can apply the benefits of AI technology to advance the security and confidentiality protection [4]. Different types of algorithms and techniques are used for AI- based services which are continuously developing on the world wide security market. Deep learning techniques are probably the most accomplished and prevailing tools in the domain of AI [5]. The rapid growth of malware and different types of attacks, are unavoidable in the advancement of intelligent security. The outcomes of the AI are generally applicable [6]. AI executes perceptively to detect a specific state of interest and respond perceptively, which help in identifying the threats [7]. AI-based approach can be used for defense. This method is used for the modification and customization as per the user's interest [8]. Artificial intelligence in addition to advanced mathematical methods have become crucial to the investigation of power quality [9]. Earlier, many of the security researchers have proposed a methodology by designing smart home security monitoring system using ZigBee technology. Through connecting the traditional sensor alarm system and image monitoring system, a new type of smart security system has been developed [2]. In paper proposed in the reference [1] states Automatic Child Monitoring (ACM) enhances the safety of children by detecting whether children are in the safe zones. Video based person identification and activity detection for secure applications by using new techniques like multiple sensor integration for energy efficient applications have been rapidly progressing [3] Video Surveillance is a universal topic and it is an attractive method used for safety and security in the smart home surroundings. In this MLP Neural Network is used to precise different gestures and resolves fall event making use of human fall detection system [10]

### III. DLS ENVIRONMENT

#### Deep Learning Studio

The Deep Learning Studio is an open platform which will automatically design a deep learning model as per the user's customization. This platform has no coding required. It is just a drag and drop interface which helps us to easily design deep learning models Deep learning. One can upload the data in various formats from Cloud repositories as well. All the models which we create will be saved as experiments for further analysis in future. For our project we have to train the camera so that it can notify to the user if there is any obstruction or any other violence happening in the surroundings of the camera. **Figure 1** below shows the DLS drag and drop platform



Figure 1

#### Features of Tensor Camera

**Figure 2** below describes the various features provided by Tensor Camera for different technologies. Below figure about facial recognition, object detection, activity recognition and voice recognition etc.

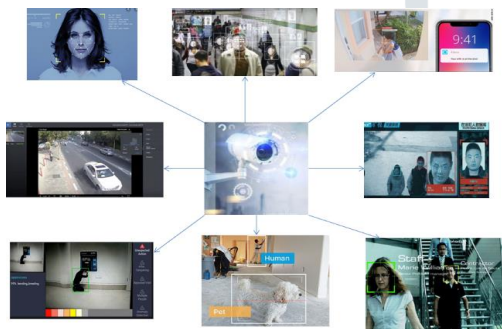


Figure 2

### IV. PROPOSED FRAMEWORK

**Figure 3** below describes the flow of the process. Here our AI device TensorCam will capture the image of the person who comes in the scope of the camera. The image is matched with the images already existing in the database. For performing the search, we need to create a database containing the images of the criminals and those who are suspected to do crimes. Another database is to be created which has the images of the regular visitors or acquaintances. The camera can be trained using the model which is generated using the Deep Learning Studio. We give the criminal database and the visitors database as input to the model and also define certain characteristics of the burglar like wearing mask and carrying weapons. TensorCam also captures the emotions of the person. By this feature we can add a characteristic features of a burglar like tensed, fear and anger to the model. By making use of the feature called Object detection we can train the model to detect the presence of the harmful weapons. By the feature activity recognition, we can train the model to detect any violence or damage being done to the assets or a human personal. Once the model is ready it can be implemented to detect the criminals or any violence at the target site. If anything, unusual is detected a message is dropped immediately to the owner and the authorities if any specified by the owner. We can also add an alarm which shall warn that something is happening at the site so that immediate action can be taken Thus, AI CCTV cameras can operate as a Security guard

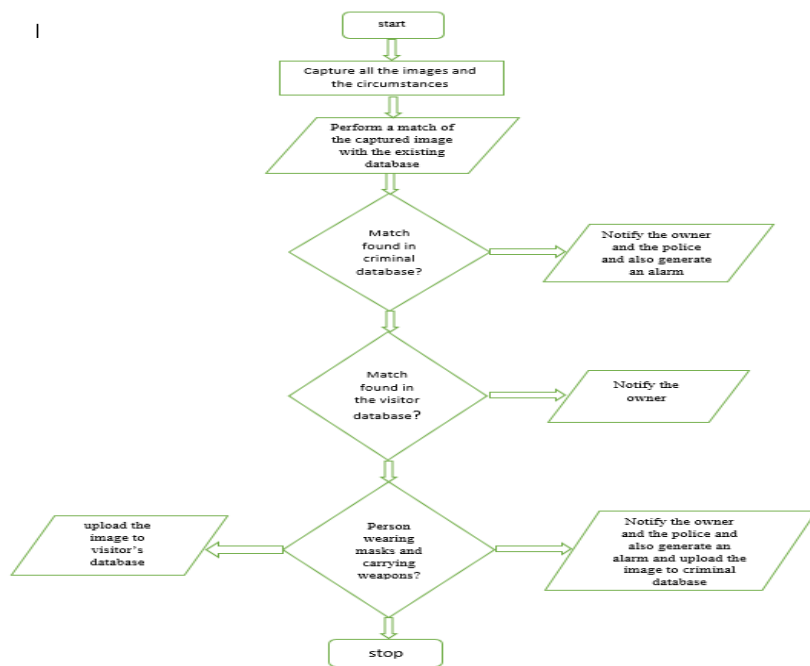


Figure 3

Advantages of using Tensor camera:

1. Real time data monitoring
2. Face recognition for public security
3. Smart surveillance in different areas
4. Customizable as per the requirement.
5. Deter crime and gather accurate evidence

Disadvantages of Tensor camera:

1. Privacy is a major issue
2. Cameras can be costly for a common user
3. Then can be vulnerable at times of misuse

## V. CONCLUSION AND FUTURE WORK

This technology of smart Ai cameras is going to change our life in near future. The process of modelling an AI device has been made much simpler by using DLS platform. In this we have made use of this technology for safeguarding our home. But this technology can be extended to another application like Hospitals, Banks, Educational Institutions, Kids Daycare centers, Elderly monitoring and many more. This can be used at the places where continuous surveillance is required. The future scope of this application is to train an ordinary CCTV camera such that it can act as Smart AI CCTV camera. This can be done by making use of Arduino which is fed by the deep learning algorithm which will train the CCTV camera to act as a Smart CCTV camera which is cost efficient and can be programmed as per the requirements

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