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Surveillance Camera using Machine Learning

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Abstract: *Artificial intelligence have played a great role in our daily life. AI have now been implemented in almost all the fields nowadays. It's been decade since AI have taken over the cyber world. AI have been implemented traffic cameras to sense the violation of traffic of rules. The functionality of these camera is very limited. Many other nations have implemented these technologies according to their specification so that they can customize according to their need. These technologies have their own advantages and disadvantages. We need to calibrate these advantages so that we can use this AI technology. Recent incidents in India by applying these cameras have given many errors in the camera, that's because it has not implemented in the correct manner. We need technologies that are specifically designed to match the conditions. Suppose if it is raining then we need to calibrate these cameras according to those conditions. The applications of the AI cameras and its uses are discussed.*

Keywords: Surveillance Camera, Traffic Camera

I. INTRODUCTION

The growth of the digital camera market can be said to have begun in the late 1990s and early 2000s.Till date surveillance cameras have played a greater role in our daily life. we need high speed high accuracy cameras to capture these footages and analyse it using Artificial Intelligence. So, for that we use smart cameras(sensors). We also need high speed storage for storing these footages captured using these AI cameras. When compared to cameras without AI there are lots of advantages for AI cameras such as preventing theft, avoid violation of traffic rules etc.

All the developing countries have now implemented surveillance cameras in all traffic signals. AI cameras can be used in public places to capture footages of any kind of crimes and can give alarm to the operators at real time so that they can avoid that crime before it gets more complicated. These types of cameras have played a great role in our daily life. AI CCTV cameras are network IP cameras that deliver advanced analytical functions like vehicle detection, face detection, person detection, people counting, traffic counting and license plate recognition (LPR). Advanced video analytics software is built into the camera and recorder, which then enables artificial intelligence functions**.**

II. GENERAL ASSUMPTION AND SYSTEM ARCHITECTURE

In order to use the visuals, we need high speed, high accuracy cameras in traffic signals, called Smart Camera. Only those footages can be correctly analysed using AI. A smart camera (censored camera) is a machine vision system which, in addition to image capture circuitry, is capable of

extracting application specific information from the captured of extracting application specific information from the captured images, along with generating event descriptions or making decisions that are used in an intelligent and automated system. We also need high speed storage for storing these visuals.

How Does It Work?

For AI CCTV camera to work, data is constantly sent to a recorder and Processed via an AI layer to make sense of the raw video. Rule-based AI cameras are manually set up with rules and reference image such as humans in different postures, angles or movements. The AI will then ask itself if anything it observes looks and moves like this.

Depending on the rules set, such as 'no one is allowed in this area at a certain time' if the camera observes this, it will send an alert.Some of these systems are self-learning, like those which use "behavioural analytics" software. With this technology, the AI analyses normal behaviour for the area and gradually builds up a definition of this typical behaviour, including the size, speed and colour of particular object. It then normalizes the data, tagging any object and patterns it observes. When something the AI sees falls outside of this typical behaviour, it alerts security professionals.

III. ARTIFICIAL INTELLEGENCE

While there have been several definitions of artificial intelligence (AI) throughout the years, John McCarthy gives the following explanation in this 2004 study "It is the art and science of creating intelligent devices, particularly intelligent computer programmers. It's akin to the problem of utilizing computers to study human intellect, but AI doesn't have to be limited to physiologically observable ways."

However, a long time earlier than this definition, the birth of the synthetic brain dialog used to be denoted by means of Alan Turing's seminal work, "Computing Machinery and Intelligence", which was once published in 1950. In this paper, Turing, oftenreferred to as the "father of computer science", asks the following question, "Can machines think?" From there, he affords a test, now famously regarded as the "Turing Test", the place a human interrogator would try to distinguish between a pc and human text response. While this test has gone through a good deal scrutiny seeing that itpublishes, it stays a necessary section of the records of AI as nicely as an ongoing notion inside philosophy as it utilizes ideas round linguistics.

IV. TRAFFIC CAMERAS

AI CCTV cameras are network informatics cameras that provides totally different analytical functions like face detection, vehicle detection, person detection, License Plate Recognitions (LPR). Advanced analytical functions are engineered into the cameras and recorders, which then checks those captured videos using these computing functions. For the AI cameras to figure they provided data at the same time to the recorder and analyze it using an AI layer. Rule-based AI cameras are supplied with some set of rules and reference pictures of individuals in several angles postures and movements and supported these set of rules it analyses the captured videos. The AI

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V. ARTIFICIAL INTELLIGENCE CCTV CAMERA IN PUBLIC PLACES

In both public and private places, CCTV cameras have long been utilized as deterrents to criminal activity or to diminish the fear of crime However, many older CCTV systems can only help to solve a crime after it has occurred, which is often too late.

Figure 1: AI CCTV

AI CCTV, like traditional CCTV cameras, records data so that any occurrences may be examined. AI CCTV, on the other hand, can identify and deliver alarms in real time. This implies that operators can send out mobile response units to deal with a situation as it happens. These systems can also allow object tracking, in which a red rectangle appears on the screen and follows the detected threat automatically. Some cameras additionally include a two-way audio system, allowing operators to communicate with anyone in the surrounding.

VI. THE ACCURACY OF ARTIFICIAL INTELLLIGENCE SURVELLANCE

AI CCTV cameras are far more accurate than ordinary CCTV cameras because they eliminate human error. This significantly minimizes the number of false alarms and hence the system's operational expenses.

The view of a typical camera in a public location may be blocked by weather, such as rain or fog, or by actual objects. Any potential security problems may be difficult to notice for the individual observing the video. The AI CCTV camera, on the other hand, can look impartially at all of the cameras in the region at the same time and compare them to the millions of reference photos it analyses to detect an intruder or threat more quickly.

Temporary AI CCTV towers are common in private locations like as building sites, where work is done for a set period oftime. However, AI CCTV may be used in public spaces to monitor crowds, such as during sporting events. AI CCTV cameras are far more accurate than ordinary CCTV

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VII. WHAT IS NEXT FOR PUBLIC SPACE SURVELLANCE?

AI CCTV cameras have shown however the security industry is consistently developing with the assistance of latest technologies. Other options found in new CCTV camera systems are thermal cameras, solar-powered cameras and people with options like time-lapse and heat/fire detection.

In one thing such as Tom Cruise's Minority Report, some police forces within the United Kingdom have been trailing a system that can predict if someone is trying to commit a criminal offense in order that they will stop it before it happens. The system, that is that the initial of its kind, uses over a computer memory unit of knowledge from native and national police databases, together with records of antecedental stopped and searched folks and their criminal records. The police found nearly 1400 indicators that might be useful to predict crime. What happens once people are detected is debated, however support from social services has been offered as a possible answer.

Figure 2: AI Cameras in Public Surveillance

VIII. CONLCUSION

The Applications of AI Cameras are very vast we have to use it very intelligently and efficiently to get its maximum output. There are some disadvantages in this system which can overcome and make AI very useful in our daily life. The Future of these technology is very advanced like AI cameras for the detections of crimes before it happens. Likewise, we can make it our future.

REFERENCES

[1] American Association for Artificial Intelligence (AAAI), Welcome to AI Topics, 2003, http://www.aaai.org/AITopics/ -- a Web-based library of introductory information about various areas of artificial intelligence; altogether, a resource with links to hundreds (thousands?) of sites, organized by an easy-to-use, interactive index.

[2] George Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Fourth Edition Addison-Wesley, 2002 -- a well-respected introduction to artificial intelligence, as witnessed by its being in its fourth edition.

[3] Peter Norvig, AI on the Web, http://aima.cs.berkeley.edu/ai.html -- a list of over 800 links on various aspects of artificial intelligence.

[4] Nils J. Nilsson, Artificial Intelligence: A New Synthesis, Morgan Kaufmann Publishers, 1998 -- another fine introductory textbook on artificial intelligence.

[5] Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, Second Edition, Prentice-Hall, 2003 -- the leading introductory textbook in the field.

[6] "Video Analytics - an overview | ScienceDirect Topics". www.sciencedirect.com. Retrieved 2020-11-01.

[7] Green, Mary W. (1999) The Appropriate and Effective Use of Security Technologies in U.S. Schools, A Guide for Schools and Law Enforcement Agencies, Sandia National Laboratories

[8] Pedro Domingos, The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World, September 22, 2015 Basic Books.