

Intelligent security system using deep learning on Raspberry pi

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ABSTRACT:

In the humanless surveillance, there is need to act to forbidden acts as early as possible. Hence deep learning based system provides the relief to the above mentioned problem. This project deals with the design approach of Real-Time Security System using deep learning on Raspberry Pi. It is focused on developing a security system that detects suspicious activities such as chasing, fighting, etc and immediately responds by sending captured image to the drop box and sending real time alerts to concern. The proposed system presents the idea of monitoring a particular place and sensing the activities that is being carrying out by the persons or objects. The proposed system offers intelligent detections of forbidden acts in near real time and also records the act in cloud hence there is no way to manipulate or destroy the image.

KEYWORDS:

Raspberry Pi, Camera module, IoT monitor and control, drop box, CNN, LSTM, NLP, pytorch framework, python.

BACKGROUND:

The demands on video security systems are rapidly increasing in the present day. In order to maintain peace and security to people, now a days a CCTV is being utilized. CCTV systems may operate continuously or only as required to monitor particular event. Now a days, People will want to know about their security system is whether or not they have the ability to connect to it over the internet for remote viewing. In CCTV system we could come back and review the footage but damage could have happened. There are some disadvantages of CCTV which includes high maintenance cost, hacking CCTV footage, lack of privacy.

PROPOSED SYSTEM:

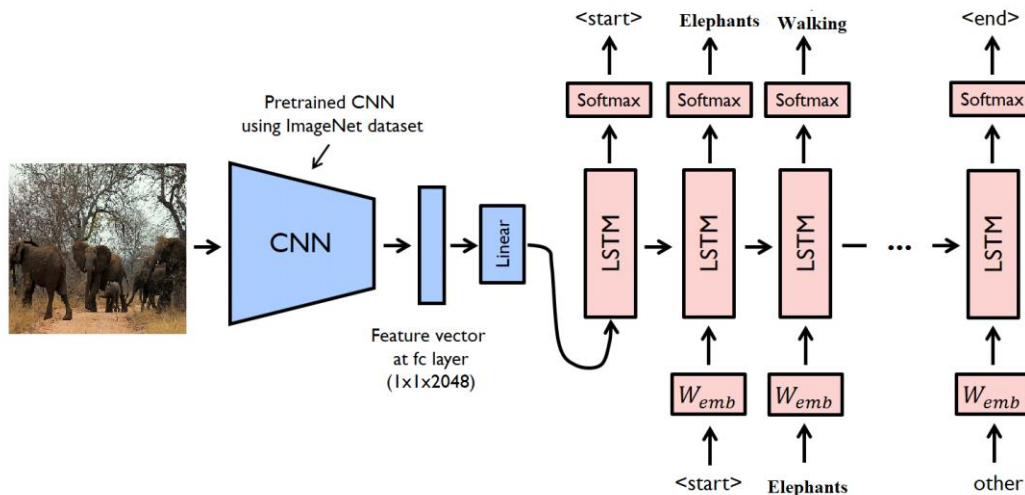
The proposed system describes a security system developed using Raspberry Pi, pytorch framework, python language, Natural Language Processing and pi camera which keeps monitoring a certain highly secured region continuously. The pi camera will capture activities after every 5 seconds. This images will stored in cloud. The same image will given to python program. A pytorch framework, machine learning library of python will be used for identifying what is happening in the image. Using Natural Language Processing we will get one line output. After image processing we can identify suspicious activities like chasing, fighting, etc and message will send to dropbox.

OBJECTIVES:

- 1) To study and describe how the Raspberry Pi can be interfaced with a motion detector and Pi camera.
- 2) To design and implement a motion detecting for real time image captioning.

- 3) To study how a Raspberry Pi can be programmed using python language and able to send message to dropbox
- 4) To study cloud computing concepts.[1]

FIGURES:



Fig[1.1]: Sample model[2]

FOR EXAMPLE:



Fig[1.2]:Sample image

It gives output as:

<start>a group of elephants walking through a forest<end>

The task of image captioning can be divided into two modules, first is image based model which extracts the features and nuances out of our image, and the other is a language based model which translates the features and objects given by our image based model to a natural

sentence. For our image based model we usually rely on a Convolutional Neural Network model. And for our language based model we rely on a Recurrent Neural Network. In this project includes image based model. [2] As reference to above image, our task is to find what is exactly happening in the given image. The generated output must describe the single line sentence that what is shown in image. This is very huge and complex task for an artificial intelligence to find the object, their properties, the action performed, interaction between the objects. Hence to solve this problem, the complex and advanced technique can be used called as Deep learning. So we take our image as a input and generate the description as output. We required to download the datasets for train the model. Now we can search for all words in the dataset and build a vocabulary list. Then the program will find the appropriate word from the dataset which gives the information about the actions in the image and the output is generated. After processing further using natural language processing the words like 'elephants', 'forest', 'walking', 'group' are compare with forbidden acts.

CONCLUSION:

Hence as compared to CCTV system, the proposed system is more Intelligent, secure and cost effective. . Raspberry pi is low cost embedded hardware platform which is having very good features. For future development, accuracy of deep learning model used here can be enhanced further by training the model on high computing environment like NVIDIA GPU.

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