INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.379

📱 9940 572 462   🟢 6381 907 438   ✉ ijircce@gmail.com   @ www.ijircce.com

Video Summarization of Surveillance Camera Using MobileNet SSD Object Detector

Amruta Shinde[*1], Purva Takale[*2], Sanket Patil[*3], Prajakta Patil[*4], Prachi Pathak

B.E Student, Dept. of C.S., Dr. J. J. Magdum College of Engineering, Jaysingpur, India

B.E Student, Dept. of C.S., Dr. J. J. Magdum College of Engineering, Jaysingpur, India

B.E Student, Dept. of C.S., Dr. J. J. Magdum College of Engineering, Jaysingpur, India

B.E Student, Dept. of C.S., Dr. J. J. Magdum College of Engineering, Jaysingpur, India

Assistant Professor, Dept. of C.S., Dr. J. J. Magdum College of Engineering, Jaysingpur, India

ABSTRACT: The number of surveillance cameras used for security purposes in private and government property. Constant working surveillance cameras produce huge amounts of video data. These data are used as information not only by the owner but can be useful for criminal investigation points of view of police officers. So, it is necessary to process the captured video such that we can quickly overview the activities captured by the surveillance cameras' lengthy video. This paper proposes a powerful approach to multiple human action detection, recognition, and summarization of surveillance videos based on the MobileNet Deep Neural Network.The Proposed Mechanism will summarize only those frames which are detected that the object is moved. and dropping redundant frames. All Movable objects present in the captured video were detected and sav by our program. these active frames are then enclosed in a single clip.

KEYWORDS: Video Summarization, Surveillance camera video summarization, Video Summary

I. INTRODUCTION

Security is become a primary concern in the recent days and surveillance plays a major role in security. Now a days the number of surveillance cameras installed on private & public properties increases rapidly. These surveillance cameras continuously capture videos 24 hours therefore produces considerable amount of data on daily basis. The storage, retrieval, management and analysis of the data became a demanding task.Processing videos requires considerable time , as to extract the relevant or most essential data the user has towatch the entire long videos. Moreover, a large part of these videos is non-essential and sometimes it is repetitive. Manually watching these long videos for hours can be wastage of much time and tiring. Besides, focusing on the same video or video screen for long hours sometimes became erroneous. The chances for a person to miss out any important event in the video are high.

Hence it requires to develop an efficient technique that helps in reducing the gap between lengthy video into short videos while still retaining important events. This can be also applied to any lengthy video where the entire content can be narrowed down to only those part with dynamic frames.

There are numerous techniques which provide video summarization. But most of these techniques used for videos such as sport, entertainment and many more. These techniques generally create a video summary that is highlights of sports videos and entertainment videos etc.

There are Multiple processing methods are present for reducing the storage of Surveillance video by containing only important frames here important frame means object movable frames. Surveillance video summarization is basically the short summary of long captured video. Video summarization of surveillance video should contain only important frames and drop the remaining frames .

This project approach for creating summarize video based on the object detection. After converting surveillance video into image frames this each frame comparing with adjacent frame and if there is difference in frame then it adds as an important frame. Remaining common frames drop from the video. Other important frames enclosed in single clip as output summarized video.

This work proposes a method to detect motion from a web camera and live stream the video on a website.A conceptual schema is presented. The main motive of the work done is to reduce the storage of the data by recordingonly themotion detected part and dropping redundant frames in the video.

II. METHODOLOGY

The main work of our proposed system is to generate a summary of the Surveillance video using the convolutional neural network (CNN). A video summary be generated based on the important frames of videos. Important Frame means here a frame in which the objects movement detected.
The main benefit of the project will be mainly for the owner of private property, and government property the investigate the criminal proof.
The proposed system generates a summary of the Surveillance videos using the CNN model based on the object detection in frames of the video using mobilenet SSD.

Algorithm:
Input: Surveillance Video Clip
Output: Summary of the surveillance video
Step 1: Input the surveillance video.
Step 2: Extract the video frames.
Step 3: Give Input the Frames to the CNN.
Step 4: Detect the Objects using a MobileNet SSD
Step 5: Select the frames with Objects detected as Important frames.
Step 7: Find similar frames.
Step 8: Delete the redundant frames
Step 9: Generate the video summary

This Project Contains 3 modules:
1)Video Segmentation
2)Motion detection
3)Combining all Important frames into a video

1)Video Segmentation:
These Projects Surveillance Videos were captured by the still camera. The background of such videos is constant so they do not have any shots. Video segmentation is the process of converting video into images. This conversion is done by splitting the complete video into a number of frames.

2)Motion Detection:
Detection of moving object in video sequence is difficult task and also challenging problem to save important frames of video frame. This Process detect various object present in frames of video. Here object like human, chair, bench, plant etc. by using MobileNet SSD method.

3)Combining all Important frames into a video:
Video summarization is the last step of this project where only important frames would be selected where in an object is detected. The frames with object present in it will be combined together to form the video summary. And it will present as output of video summarization.
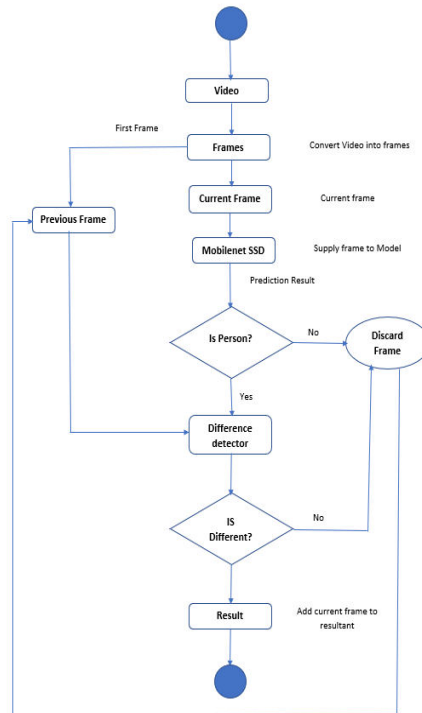
III. MODELING AND ANALYSIS

Fig 1. Flow chart of video summarization of surveillance camera

1.Object Detection:

In this model, the presence of moving objects is determined by comparing 2 successive frames. Moving objects are detected by taking pixel –by –pixel difference of adjacent frames in video.The previous frame is compared and then subtracted with the current frame. This allows us to obtain only those areas in the scene where motion is detected.

In object detection, we use MobileNet SSD model which is an object detection model that computes the output and object class from input image. The Single Shot Detector(SSD) object detection model uses MobileNet as backbone because it can achieve fast object detection.

2.Video Summarization:

Video summarization helps in efficient storage, quick browsing, and retrieval of large collection of video data exclusive of losing important aspects. To provide the user a synthetic and useful visual abstract of video sequence, a video summarization of video is required.

In video summarization, the input data set is a surveillance video taken from a private place. The input video is split into frames. From each frame the objects such as human, animal or vehicle is detected. Only those frames which contains the object are then taken for further processing. If the activities of the person detected needs to be tracked and all the selected frames are considered for video summarization. Else clustering of the frames is carried out, where in the redundant frames are discarded and only the distinct one is kept. And the summarization video is created from these selected frames.

IV. RESULTS AND DISCUSSION

In this section, we demonstrate purpose of our proposed method by providing the experimental results as this model successfully generates summarized video output for given input video and stores it. The approach is implemented using Python programming language.

Surveillance video is an input data set provided to model. The input data video is split into number of frames. The model takes two frames for comparison current frame and previous frame. The mobilenet SSD model detects the person by providing current frame. Only those frames with the person exist are then taken for further processing. Then the difference in the frames is detected by difference detector using threshold value. If Frames Threshold value is

greater than average threshold value then it considers as an important Frame. And where in the redundant frames are discarded and only the distinct one is kept. And the summary is created from these distinct frames.

Fig 2. Shows the long period of video is converted into image frames
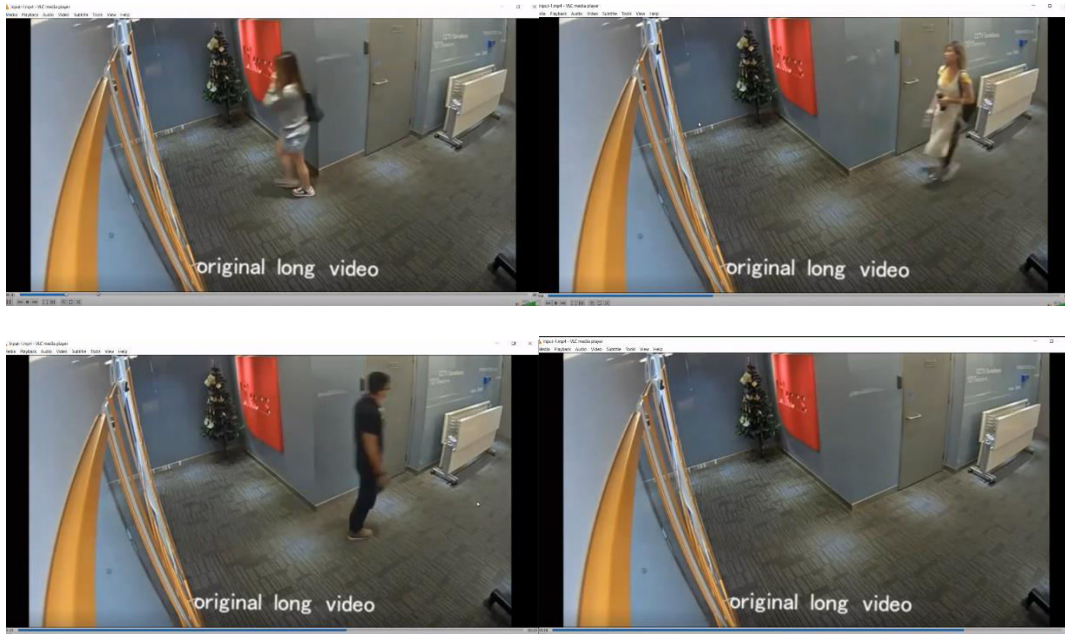

Fig 2. Frames of Video

Fig 3. Shows the Unique, common frames count present In Video of surveillance camera.

Fig 3. Shows unique frames count

V. CONCLUSION

All the main points of the research work are written in this section. Ensure that abstract and conclusion should not same. Graph and tables should not use in conclusion.

In this paper, video summarization will be generated through detecting objects present in the surveillance video. This project has been implemented for reducing the storage space of surveillance video without losing any essential information and also quality of the video.

There are two major modules in our project first module performs object detection in this module moving objects is determined by comparing 2 successive frames. Second module performs video summarization from original lengthy video and generates summarized video.

The input video is taken and video is converted into frames, from each frame object is detected. Only those frames which contain object are considered for video summarization.

Output of our project is Summarized video generated from original video.

REFERENCES

1. S. Murugan, K. S. Devi., A. Sivaranjani, P. Srinivasan, ―A study on various methods used for video summarization and moving object detection for video surveillance applications‖, Multimedia Tools and Applications, 77(18), pp. 23273-23290,2018.
2. E. Asadi and N. M. Charkari, "Video Summarization Using Fuzzy CMeans Clustering," in 20th Iranian Conference on Electrical Engineering, (ICEE2012). IEEE, 15-17 May 2012, pp. 690 – 694.
3. E. J. Y. C. Cahuina and G. C. Chavez, "A New Method for Static Video Summarization Using Local Descriptors and Video Temporal Segmentation," in 26th Conference on Graphics, Patterns and Images (SIBGRAPI). IEEE, 5-8 Aug 2013, pp. 226–233.
4. T. Mei, L.-X. Tang, J. Tang, and X.-S. Hua, "Near-Lossless Semantic Video Summarization and Its Applications to Video Analysis," ACM Trans. Multimedia Computing Communications and Applications, June 2013.
5. Y. Wang, J. Zhang, L. Zhu, Z. Sun and J. Lu, "A Moving Object Detection Scheme based on Video Surveillance for Smart Substation," in 14th IEEE Int. Conf. on Signal Process. (ICSP), Beijing, China, Aug. 2018, pp. 500-503, doi: 10.1109/ICSP.2018.8652316.
6. Omar Elharrouss, Noor AlMaadeed, Somaya Al-Maadeed¸"Video Summarization based on Motion Detection for Surveillance Systems", IEEE 2019
7. Wu, X. He and T. Q. Nguyen, "Moving Object Detection with a Freely Moving Camera via Background Motion Subtraction," in IEEE Trans. on Circuits and Syst. for Video Technol., vol. 27, no. 2, pp. 236-248, Feb. 2017, doi: 10.1109/TCSVT.2015.2493499.
8. K. Patel, "Motion Detection and Segmentation in H.264 Compressed Domain for Video Surveillance Application," Int. J. of Eng. Res. and Technol. (IJERT), vol. 3, no. 4, Apr. 2014.

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Scan to save the contact details