IOT VIDEO ECOSYSTEM FOR VIDEO STORAGE AND ANALYSIS

Radha R*, Dr. Selvarani R*
Computer Science and Engineering,
Alliance University, Bangalore, Karnataka, India

Abstract- Cloud computing, needs that all things be associated to the central information storage, where enormous capacities of information are processed to find optimization solutions or make business decisions. IoT video data are collected through the sensors before it could be stored into cloud/storage server. We can apply few analyses to classify data which are useful to store and which can be discarded local to IOT device. The IOT video data consolidated from the devices to the Cloud is voluminous, and the quality of results is not significantly compromised, then the Edge analytics can be performed for the aggregation/transformation process to reduce the size of data streams before sending them to Cloud. If the control action needs to be relatively real time, then the action latency and efficiency are determining metrics to co*n*sider edge analytics. Our proposed framework collects IOT video from bigger and smaller ecosystem, do edge analytics to classify the useful data and draw an automatic prediction or an insight to categorize IoT videos and give them a semantic link to IoT videos. This categorization allows coming up with new mode or cloud ecosystem (smart city cloud, smart traffic cloud, education, energy) which allows group and store specific information for specific purpose.

Index Terms- **Edge analytics, video streaming, classification, and Prediction**

I. INTRODUCTION

The internet of thing is the network of devices that contain electronics, software, sensors, actuators, and connectivity which lets these things to link, act together and exchange data. The networking capabilities and miniature size of sensors have added to the proliferation of Internet of Things (IoT) and continuous sensing environments. Video data from such sensors must be analyzed real-time with low latency, Edge computing reduces latency because data does not have to traverse over a network to a data center or cloud for further process. Edge computing allows information produced by internet of things (IoT) devices to be administered closer to where it is created instead of sending it across long routes to data centers or clouds. This is ideal for situations where delays of milliseconds can be unacceptable, such as in financial services or manufacturing. Challenges in achieving this include: high data arrival rates, buffer overflows, context-switches, and object creation overheads.

However this ‘cool’ data system with its high-tech varied sensors are nonentity without being analyzed real-time by Stream Processing. Stream processing is a technology acting while the data is being produced, enabling its applications to act-on (collect, integrate, visualize, and analyze) real-time streaming data. In other words, Stream Processing enables us the facility to quickly process large amounts of data from multiple sources, in real-time. The cutting edge

Technique in Internet of Things (IoT) applications involve video analytics—a technology that applies machine-learning algorithms to video feeds, enabling sensor cameras to recognize people, objects, and situations automatically. These applications are new, but several factors are

encouraging their growth, including the increased sophistication of analytical algorithms and lower costs for hardware, software, and storage. Live video from sensors gives many advantages in relation to other sensing modalities. Most significant is its rigidity and open-endedness: new image and video processing algorithms can be developed to enhance the data pull out from an existing video stream. Furthermore, video offers high resolution, wide exposure, and low cost relative to other sensing modalities. The inactive nature of video sensing is especially striking for public spaces. A participant does not have to attire a special device, install an app, or do anything special. He or she merely has to be noticeable to a camera.

IoT video is collected form bigger and smaller ecosystem. By collecting, analyzing, applying various methodology/statistically analysis, this research aims discard 10% of the data which is not useful to store in cloud/server. Also, an automatic prediction or an insight can be drawn to categorize IoT videos and give them a semantic link to IoT videos. This categorization allows coming up with new mode or cloud ecosystem (smart city cloud, smart traffic cloud, education, energy) which allows group and store specific information for specific purpose, examples.- All smart cities based IoT videos will be moved smart city cloud storage, which later can used to analyze indent like theft analysis, power failure, and traffic.

II. IDENTIFY, RESEARCH AND COLLECT IDEA

1.Thilina Buddhika et.al(2016): stated in there paper achieving real time stream processing in IoT and sensing environments requires a holistic framework that accounts for the CPU, memory, network, and kernel issues that arise. Efficient scheduling of workloads through the use of thread pools and minimizing context-switches by processing streams in batches reduces the number of context switches during stream processing [1]

2.R. Pereira et.al(2016): stated in their research paper, some developments related to video streaming and the specific requirements associated with Low Power Personal Area Networks, the scenario relevant to the Internet of Things. They have considered alternative versions of the H.264 encoder standard, namely the AVC and its extension SVC. Evaluation is currently being conducted to assess their relative merits. Future work will include specific forms of streaming more suitable to devices of different capability, and considerations for adaptation of SVC into the DASH framework, following completion of the evaluation as indicated above [2]

3. Byungseok Kang et.al(2017): Gateways are emerging as a key element of bringing legacy and next generation devices to the Internet of Things (IoT). They integrate protocols for networking, help manage storage and edge analytics on the data, and facilitate data flow securely between edge devices and the cloud. Current IoT gateways solve the communication gap between field control/sensor nodes and customer cloud, enabling field data to be harnessed for manufacturing process optimization, remote management, and preventive maintenance [3]

4. Mr.Prabhu R et.al(2013): The mobile phones grow to be an essential part of our everyday life, with smart phone sales at present greater than before very much and also user demands to run lots of applications have enhanced. The victory of next invention mobile phone communication based on the capability of service suppliers to engineer innovative added worth to video service [4]

5. Yantao Li et.al(2016): Wireless video streaming on smartphones drains a significantly large fraction of battery energy, which is primarily consumed by wireless network interfaces for downloading unused data and repeatedly switching radio interface. In this paper, we propose an energy-efficient download scheduling algorithm for video streaming based on an aggregate

model that utilizes user's video viewing history to predict user behavior when watching a new video, thereby minimizing wasted energy when streaming over wireless network interfaces [5]

6. Jiyan Wu et.al(2017): Delivering high-definition (HD) wireless video under stringent delay constraint is challenging with regard to the limited network resources and high transmission rate. Concurrent multipath transfer (CMT) using stream control transmission protocol (SCTP) exploits the multihoming feature of mobile devices to establish associations with different access networks. In this paper, we study the multihomed HD video communication with SCTP over heterogeneous wireless networks[6]

7. Nalini Bagal et.al(2015): Real-time audio-visual communication has become the need of this era. Video conferencing may be one solution to saving both time and money. In fact, video conferencing may be a more effective way of communicating to clients and customers. Integrated Network Systems can install video conferencing that will allow you to share anything that is on your computer monitor and meet people face to face. In last few years, work is being done for real time transmission of audio and video. This paper presents detailed study of audio and video transmission through various channels. Most popular is using wireless [7].

8. Hitendra Patil et,al(2014): The standards like IETF as well as W3C are used to define the framework, protocols, and application programming interfaces. These interfaces provide further real-time interactive voice, video, and data in web browsers as well as other applications. This is explaining how media as well as data transfer in a peer-to-peer style directly between two web browsers. It's showing the protocols handled to transport & its secure the encrypted media, traverse NATs & firewalls, negotiate media capabilities, and provide identity for the media. Web Real-Time Communication (Web RTC) is an upcoming standard that aims to enable real-time communication among Web browsers in a peer-to-peer fashion [8].

III. PROPOSED SYSTEM

Live video analysis gives many advantages compared to other sensor data. In the proposed system the videos are collected from IOT devices such as video cameras from various locations and the analytics of video also called as video streaming is performed using edge analytics rather than cloud analytics. In edge analytics, small multi-tenant data centers named cloudlets are placed close to IOT devices, these cloudlets give vital privacy to public videos. Before the videos are uploaded to the cloud eco system, the video should be analyzed, recognized and perform face detection for privacy concern. Once the bounding boxes of faces have been detected, blurring those pixels is performed in cloudlets. Figure 1 shows the overall architecture of the proposed system, where the denaturing, the term used for preserving the privacy of video is performed in cloudlets, close to IOT devices.

Using longitude and latitude coordinates, we can recognize the location of the video, which lets us understand the nature of video. For example, If the crowd is more, from a particular geographic location which is usually crowded on every working days at the busy traffic signal, will give us conclusion note that the video is from the traffic camera. Likewise taking this as one of the parameter to recognize and categorize the video, we can well detect and denature the videos from public cameras. In future keeping the longitude and latitude coordinates for recognizing the nature of video, efficient algorithm will be applied for face detection and denaturing of the data in cloudlets and uploaded to cloud ecosystem for storage and distributed accessibility.

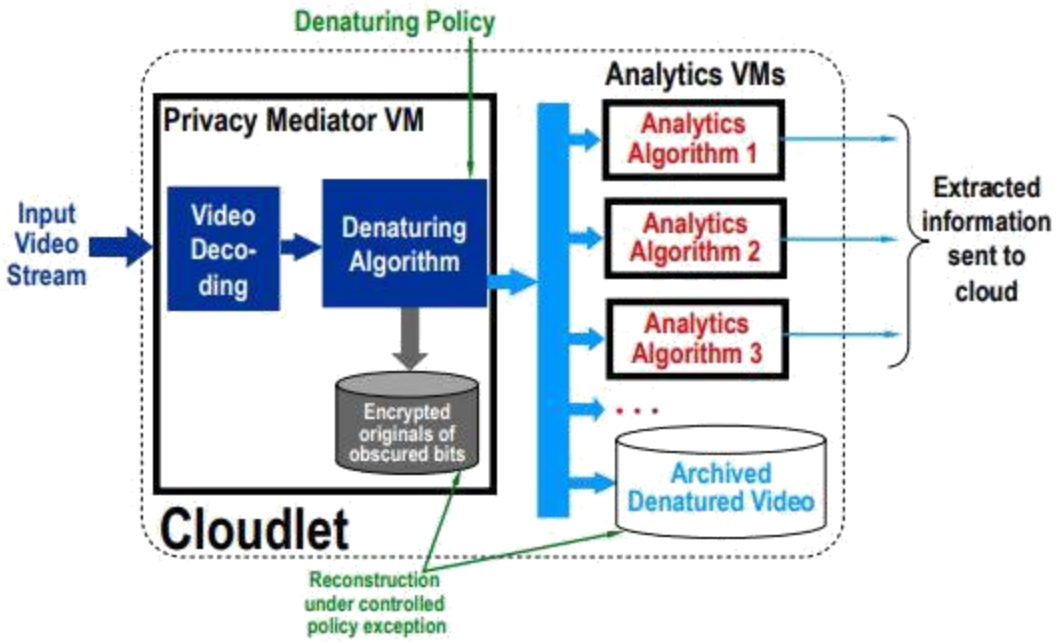

Fig 1: Architecture for live video streaming

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