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A Novel Approach to Enhance Mobile Phone Features on Video Calling

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Abstract: In the present scenario, the usage of high end technology in every field increases rapidly in this world. In every field of technological growth, the features enhancement is incorporated based on the requirement needed then and there. It is intended to apply the feature enhancement in video calling of mobile phone. Though, present video calling mechanism has features such as: one-to-one video calls, group video calls, video messaging, live texting on video call etc but still, a new approach and method is required to give advancement to the highest extent which makes the user to use this video call in a more efficient way.

Keywords: — Video call, WebRTC, Streaming

I. INTRODUCTION

A visual transmission between more than two users. In simplest way we can say that transmission of images and text between the users. It provides high resolution video frames and crystal clear audio between the users who are located in different places [8].

A video is a combination of multiple images which are in a series. Each image in the video frame is connected to the previous one. When there is a less time gap in between video frames, the video will appear more natural and smoother [6].

Video Call Invention and Growth: In 18th century, the world surprised with Alexander Graham Bell's telephone invention. This is the key of video conference [1]. AT& T introduced the first video call picture phone in 1964 and Debut of picture phone in 1980's. The video calling system was first introduced by Compression labs in 1982. Picture tells partner with IBM are the first PC based Video Call System in 1991. Life size introduced the first High Definition video transmission in 2005. From broad conference rooms to mobile devices in 2010.

Applications of Video Calling: These are the very popular video calling applications at present:
FaceTime
Skype
Google Chat
Tango
Qik
Fring

The functionality of all above mentioned applications are same, They connect multiple users via network. [7]

Working Procedure of Video Calling: Many people are using video and voice based transmission in various platforms like, Skype, FB Messenger, WhatsApp, Google DIO and etc. Mostly, both video and voice call depends on working of media stream between the subscribers, which are linked through network. So there must be something that can do the work of media streaming from one subscriber to another subscriber.

Streaming media: It is a continues transmission of multimedia to the end user, it was delivered by the provider via network. The verb "stream" glance the process of delivering media in this way. The term glance is the transmission method of the medium. This is a alternative method of file downloading. It is a process that an end user can get the content without downloading the file [8].

Live streaming is a transmission of Internet data in the real time. For example, television broadcasts its content as live over the network via television signals. Live streaming depends upon media sources (Eg: an audio interface, screen capture application, video camera, etc), an encoder to compute the convert, content delivery network and a media publisher to distribute the content

Bandwidth: It is represented as an amount of data that is transferred per unit time. In other way it is a range in a brand of wavelengths. In digital gadgets this is usually represented in BPS (bits per second). In Analog gadgets

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the bandwidth is represented in Hz (hertz). According to the gadget type the scale name changes.

WebRTC is a method used for media streaming. It is a free project and open source tool used to communicate with mobile Apps and browser in RTC (Real Time Communication). Its capabilities via simple APIs(Application Program Interfaces). By allowing peer to peer communication and it is used to audio, video communication in the web pages, the advantage of using this is no need to go for plugins in web browser. It is standardized by the W3C and Internet Engineering Task Force (IETF).

Its mission is to develop rich and dynamic applications for the mobile platform and web browser. It allows common protocols for communication between mobile platforms, browser.

Along with webRTC, there are few components to be known for full fledged implementation. They are 1. Signaling Server 2. TURN Server 3. STUN Server.

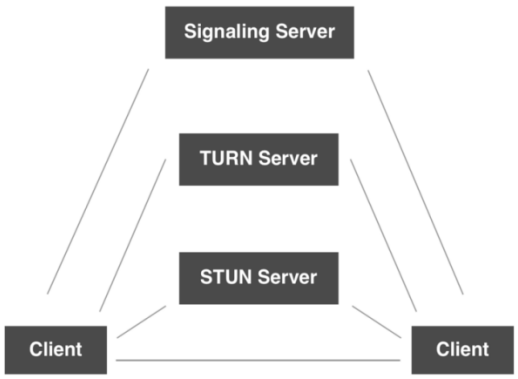

Fig. 1 Streaming Communication Architecture

Signaling: In order to setup a call between two clients, both the clients must conform to each other by sending key data, messages, about the media. For signaling purpose it is using web socket. It is just used to know that these two clients want to connect to each other for the call.

Peer to Peer Connection: After setting up the call, the peer to peer connection is needed to connect both the clients public IP address for connecting. For this it is using STUN server to get the public IP
Across the internet a Public IP address is globally unique. Possession of one IP address of on device is enough. If everything is perfect the STUN server gets the public IP of the both devices. Once the STUN gets the public IP through WebRTC we connect clients to make a call. Media streaming will be handled by WebRTC. In case the public IP of clients not able to get in that situation peer to peer connection is not possible. To handle that situation we need TURN server.

TURN Server: Once the peer to peer connection is failed. TURN acts as a mediator for connection between the clients taking the data from one client and sends to another. TURN works as a relay media. In this way both the clients starts talking.

II . EXISTING SCENARIO OF VIDEO CALL APPROACH

Stable Version: Skype introduced a stable version of video calling which is very good in Audio and Video transformation. Apple Face Time also very stable. From these two applications many people are shown lot of interest in video calling.

Screen Sharing: For screen sharing, host need to use a software program. Which allows the host to share his computer screen to others who are joined in the conference. The host shares a link by clicking that link the clients can view his computer screen.[3]

A)Gyroscopes: By using gyroscope smartphones and digital cameras can detect the orientation of the gadget. It is a small sensor. With the help of this one can eliminate the horizontal and vertical movements of the video taken by the gyroscope contained gadget [5].

III. INNOVATIVE FEATURE ENHANCEMENT FOR VIDEO CALL

Our focus is on adding some features to video calling to fulfill some more requirements to reach many people.

A)Tap to know
When Source person taps any thing on their mobile phone screen, a small dot appears on the destination person mobile phone screen. When source person tapping on various places on the screen, correspondingly, dot on the destination person screen would move.

Once it introduced in social media apps or android apps it is very useful.

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Fig. 2 Tapping Display Mechanism

Advantages

I. In Educational system, the faculty can easily explain a picture by pointing the picture in the other side students can easily understand the discussion is going on which place.

II. One side user can easily show something like places or other sceneries to other side person in the understandable way.

III. No need to go for third party tool like screen sharing application.

B) Zoom mode in video calling

When zoom is applied in live communication, the video is struggling to get stable. This may lead to little time delay in transmission of Audio and Video. Live communicating time changes cannot be achieved. This is the reason why zoom is not available.

Digital zoom functionality is same in every camera which is having zoom feature. If we have optical zoom lens, the image will get full resolution. This lens enlarges the captured image, and place that image in the image processing sensor. In this way you will get same resolution, It's not a matter of how much you enlarged the image It is possible for only with the zoom lens to transmit the real resolution. [2]

The zoom feature can be added by introducing the pause and resume feature. By this zooming of video can be done. If we want to do any changes to the live communication the video must be put in pause, after the changes the video will be resume.

Fig. 3 Zoom Display

Advantages

Easily can show one particular object by zooming. The other end user can view it in very clearly. The colors and details will be delivered very clearly in images.

C) Image Stabilization

Stabilization of image is a very effective feature of camera. The user can use this in a walking on running situations. The image and picture quality will be stable. This is a sensor based technology for the mobile camera the gadget must have a "Gyroscope" sensor for stabilization. By connecting the video calling live to this sensor the stable image will get. The Horizontal and Vertical moments can't do any changes.

There are two methods available in Image Stabilization.
1. OIS(Optical Image Stabilization)
2. EIS(Electronic Image Stabilization)

1. Optical Image Stabilization (OIS)

In this technique the image is stabilized by varying the optical path of the sensor. This is real time compensation and hence no alteration or image degradation takes place. The lens assembly is moved parallel to the image plane. Shake detecting sensors (Gyro-sensors) are used, which transmit this information to a microcomputer which in turn converts them into the Drive signal which ultimately moves the lens assembly to correct the image project on the sensor before it is converted to digital format and thus off-sets your motion. This is the basic principle of all OIS techniques Optical image stabilization will be available only in high end gadgets. Its purely hardware, cannot update it.

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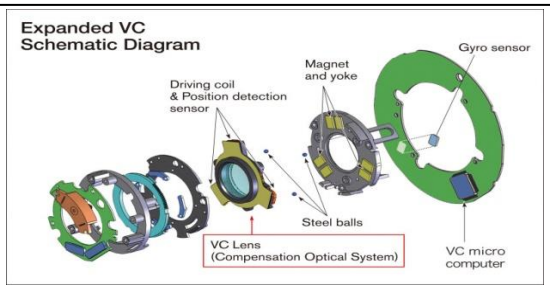

Fig. 4 OIS working procedure

2. Electronic Image Stabilization (EIS)

At present EIS (Electronic Image Stabilization) introduced in all gadgets which is cost less working mechanism. EIS works based on algorithms there is a chance to update the algorithm and make the EIS technique too strong .Which is not possible in the OIS . OIS a hardware we can't update that. By connecting the EIS of a camera with the help of user we can link it to the video calling. To make the transmission of video will be stable.[4]

Advantages using EIS

I. No need hold a mobile in one particular direction.
II. By walking and jogging conditions also can use easily.
III. Horizontal and Vertical moves will not disturb the image. The image will be stable.

D) Auto resolution of video quality

It's a big problem, we can't get everywhere strong signal because of network. Sometimes the data speed will be limited to KBPS. This type of situations transmitting of video will be in one particular resolution sudden changes of network speed and signal weak situations, the video call may lack or drops a lot. If the transmission of video automatically adjust resolution the during call resolution leads to reduce the delay of video transmission and can get the continuous communication without call drops or lacking. The resolution will be adjusted automatically according to the situation. This method of auto adjustment of video resolution will help a lot in compression and decompression of video transmission. Compression, the term represents that the size of the video is compressed. It is dissimilar to audio data in telephone stream, here the data is very lite weight. When compare it to video data, the video data is large in size. But both are stream flows. The larger size of video stream is because of the backgrounds and motion partitions (example moving objects). Motion is not a constant and not in a same size of object, so the transmission of the video between two clients is very complicated. To overcome this, reduce the size of video. This type of compressed transmission is little easy when compare to the full size video.

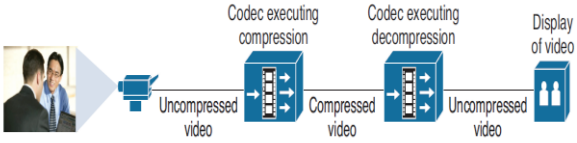

Fig. 5 Auto Resolution Procedure

Advantages

I. Sudden call drops will not occur.
II. Image and audio sinking will be very accurate
III. Video blur will be eliminated

CONCLUSION

As Video Call Applications are used widely by many people to have live communication to reduce time waste on face to face meeting, cost reduction on various means and so on. With this intention, it is proposed to enhance few features on video call method, which would give services in a better way.

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