**SEMINAR REPORT**

**TOPIC: SILENT SOUND TECHNOLOGY**

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**ABSTRACT**

It is a technology that helps you to transmit information without using your vocal cords. This technology aims to notice lip movements & transform them into a computer generated sound that can be transmitted over a phone. Hence person on other end of phone receives the information in audio.

Silent Speech technology enables speech communication to take place when an audible acoustic signal is unavailable. By acquiring sensor data from elements of the human speech production process – from the articulators, their neural pathways, or the brain itself – it produces a digital representation of speech which can be synthesized directly, interpreted as data, or routed into a communications network

The Silent sound technology is an amazing solution for those who had lost their voice but wish to communicate over the phone. This technology basically allows people to make calls without producing sounds. It is developed at the Karlsruhe Institute of Technology. This technology basically detect every lip movement and internally converts the electrical pulses into sounds signals and sends them neglecting all other surrounding noise. This report outlines the history associated with this technology presenting the method or techniques used in achieving silent sounds, which are electromyography and Image processing. This technology basically works with 99% efficiency, and can be seen in the market in another 5-10 years and will be used in every day’s technology.

**METHODS**

Silent Sound Technology is processed through some ways or methods. They are:-

1. Electromyography (EMG)

2. Image Processing

**ELECTROMYOGRAPHY**

Electromyography (EMG) is a technique for evaluating and recording the electrical activity produced by skeletal muscles. An electromyography detects the electrical potential generated by muscle cells, when these cells are electrically or neurologically activated. Electromyographic sensors attached to the face records the electric signals produced by the facial muscles, compare them with pre-recorded signal pattern of spoken words When there is a match that sound is transmitted on to the other end of the line and person at the other end listen to the Spoken words the transducers involved converts the pulses into electric signals. The electrical source is the muscle membrane potential of about -90 mV.[6] Measured EMG potentials range between less than 50 μV and up to 20 to 30 mV, depending on the muscle under observation.

**IMAGE PROCESSING**

The output of image processing may be either an image or, a set of characteristics or parameters related to the image. Most image-processing techniques involve treating the image as a two-dimensional signal and applying standard signal-processing techniques to it.

The simplest form of digital image processing converts the digital data tape into a film image with minimal corrections and calibrations.Then large mainframe computers are employed for sophisticated interactive manipulation of the data. In the present context, overhead prospective are employed to analyze the picture.

Most image-processing techniques involve treating the image as a two-dimensional signal and applying standardSignal-processing techniques to it. Analysis of remotely sensed data is done using various image processing techniques and methods that includes:

1. Analog image processing

2. Digital image processing

**APPLICATION AREAS**

As we know in space there is no medium for sound to travel therefore this technology can be best utilized by astronauts. We can make silent calls even if we are standing in a crowded place.

This technology is helpful for people without vocal cord or those who are suffering from Aphasia (speaking disorder). This technology can be used for communication in nasty environment.

To tell a secret PIN no. , or credit card no. on the phone now be easy as there is no one eavesdrop anymore. Since the electrical signals are universal they can be translated into any language. Native speakers can translate it before sending it to the other side. Hence it can be converted into any language of choice currently being German, English & French.

**ADVANTAGES OF SILENT SOUND TECHNOLOGY**

1. Helping people who have lost their voice due to illness or accident.

2. We can make silent calls even if we are standing in a crowded place.

3. Allow people to make silent calls without bothering others.

4. Silent Sound Techniques is applied in Military for communicating secret/confidential matters to others.

5. Since the electrical signals are universal they can be translated into any language. Native speakers can translate it before sending it to the other side. Hence it can be converted into any language of choice currently being German, English & French

**DISADVANTAGES**

1. Translation into majority of languages but for languages such as Chinese different tone holds different meaning, facial movements being the same. Hence this technology is difficult to apply in such situations.

2. From security point of view recognizing who you are talking to gets complicated.

3. Even differentiating between people and emotions cannot be done. This means you will always feel you are talking to a robot.

4. This device presently needs nine leads to be attached to our face which is quite impractical to make it usable.

**CONCLUSION**

Silent Sound Technology, one of the recent trends in the field of information technology implements “Talking without Actually Talking”. Engineers claim that the device is working with 99 percent efficiency. It is difficult to compare SSI technologies directly in a meaningful way. Since many of the systems are still preliminary, it would not make sense, for example, to compare speech recognition scores or synthesis quality at this stage.

‘Silent Sound’ technology aims to notice every movements of the lips and transform them into sounds, which couldhelp people who lose voices to speak, and allow people to make silent calls without bothering others. Rather than making any sounds, your handset would decipher the movements your mouth makes by measuring muscle activity, then convert this into speech that the person on the other end of the call can hear. So, basically, it reads your lips. It will be one of the innovation and useful technology and in mere future this technology will be used in our day to day life.