
SILENT SOUND TECHNOLOGY

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ABSTRACT

Everyone has been on a train or bus during a ruckus and heard someone talking on the phone loudly. There is no longer a need to shout for this. Using "silent sound technology," this issue can be resolved. For those who have lost their voices but still wish to interact on the phone, silent sound technology is a great solution. The Karlsruhe Institute of Technology is producing it, and it will be made available soon. When displayed, it seems to be able to pick up on every lip movement. Inside, it converts electrical pulses into sound signals, which it then transmits out while oblivious to other background noise. Undoubtedly, it will be a great solution for those who are upset by other people's conversations. The goal of silent sound technology is to translate every lip movement into sound, perhaps enabling communication for persons who have lost their voices and enabling private conversations without disturbing others. Your handset would interpret your lip movements by detecting muscle activity instead of producing sounds, and it would then translate this into speech that the person on the other end of the line could hear. It basically reads your lips. This new method will be quite helpful whenever someone loses their voice while speaking, allowing people to make silent calls without disturbing others and even enabling us to share our PIN number with a trusted friend or family without worrying about being overheard. The hearer can clearly hear a distinct

Keywords: Silent Sound Technology, Eelectromyography, Image Processing.

I. INTRODUCTION

For those who still wish to interact on the phone but have lost their voices, silent sound technology is a great alternative. The Karlsruhe Institute of Technology is producing it, and a release is anticipated soon. While disregarding all other background noise, it seems to be able to detect every lip movement and internally convert electrical pulses into sound signals before sending them. It will surely be a great choice for people who get annoyed when others use the phone loudly. It's challenging to hold a phone conversation in a theatre, a noisy restaurant, a bus, or anywhere else where there's a lot of background noise. It's a method that enables data transmission without the usage of voice. The "future park" at CEBIT 2010 included "Silent Sound" technology, which attempts to detect every movement of the lips and translate it into sounds.



Figure 1: Common people talking at the same place without disturbance

This technology may help those who have lost their voices speak and enable silent phone calls without disturbing others. The Karlsruhe Institute of Device (KIT) developed the technology, which detects the minute muscular movements that take place during speech and converts them into electrical pulses that can then be translated into speech without the need for a sound to be made. The goal of silent sound technology is to translate every lip movement into sound, perhaps enabling communication for persons who have lost their voices and enabling private conversations without disturbing others. According to the engineers, this

technology has a 99 percent efficiency rate, and there is a 1 percent possibility that the receiver will hear a bogus word. According to Michael Wand of KIT, electrodes attached to the skin in and around the lips are now used to detect muscle movements. These electrodes might be used when this technology eventually combines with cell phones. In five to ten years, we might experience it in our daily life because KIT is still working to eliminate that 1% of technical difficulty[2].

II. TECHNOLOGY

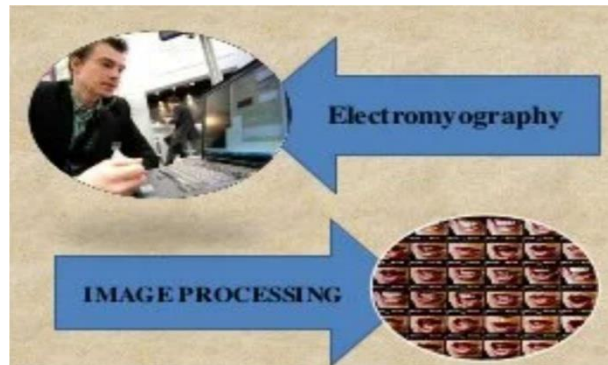


Figure 2: Methods of Silent Sound Technology

This demonstrates that the two techniques employed in silent sound technology—Electromyography and Image Processing—are different. The Silent Sound Technology use electromyography to track the minute muscle contractions that take place during speech. Without uttering a sound, monitored signals are transformed into electrical pulses that can then be used to create speech. An image signal is transformed into a physical image through the physical process of image processing. Either a digital or analogue image signal is possible. An actual physical image or an image's qualities can be the actual output.

1. ELECTROMYOGRAPHY

The Silent Sound Technology use electromyography to track the minute muscle contractions that take place during speech. Without uttering a sound, monitored signals are transformed into electrical pulses that can then be used to create speech. A method for analysing and capturing the electrical activity generated by skeletal muscles is called electromyography (EMG). When muscle cells are electrically or neurologically excited, an electromyography measures the electrical potential that is produced by these cells.

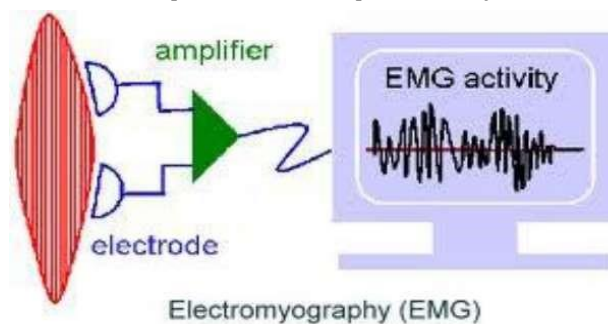


Figure 3: Electromyography

By examining the electrical activity generated by muscles, electromyography (EMG) is a technique for studying how muscles work. The neuromuscular activation associated with muscle contraction produces the electrical activity that manifests as a signal. Silent sound technology (SST) employs this technique, which detects the skeletal movement that occurs when we talk quietly and converts it to an electrical impulse signal. The face is covered with a fine wired electrode for electromyography (fig. 1.1), and the electrical signal generated by the facial muscles is recorded and compared to the recorded signal of the uttered words, which are identical. It demonstrated that the electrical signal generated coincided with spoken words and that it could subsequently be transported and transformed into the same sound.

2. IMAGE PROCESSING

With the fewest adjustments and calibrations possible, the simplest type of digital image processing transforms the digital data cassette into a film image. The data is then expertly interactively manipulated using powerful mainframe computers. To examine the image in the current situation, overhead prospective are used. Image processing in electrical engineering and computer science refers to any type of signal processing where the input is an image, such as a picture or video frame; the output of image processing can either be an image or a set of parameters or characteristics connected to the image. The majority of image-processing methods include considering the image as a two-dimensional signal and processing it using common signal-processing methods. Photography is the most popular kind of image processing. In this procedure, a digital or analogue image is created by taking a picture with a camera. Depending on the type of input source, the image is processed using the relevant technology to create a physical picture. The image in digital photography is saved as a computer file. To create an actual image, this file is translated using photographic software. When the picture is taken, the colours, shading, and nuance are all collected, and the software turns this data into an image. Analog photography involves burning an image into a film by a chemical reaction brought on by carefully timed exposure to light.

III. APPLICATIONS

- If there are no lip-readers present, you can give your PIN information to a trusted buddy over the phone without anyone else overhearing.
- Silent Sound Techniques are used in the military to transmit secret or private information Others care about you.
- Native speakers can speak aloud inaudibly in their language, and listeners can hear them hear the translation spoken in their native tongue. It seems like the native speaker is generated a foreign language speech. The language translation technology is functional like English, French, and German, with the exception of Chinese, where various tones can hold numerous distinct connotations.
- Permit individuals to make private calls without disturbing others.

IV. CONCLUSION

One of the most recent developments in information technology is Silent Sound Technology, which enables "Talking without Talking." It will be a cutting-edge and practical piece of technology that we will soon employ in our daily lives. The goal of silent sound technology is to track every movement of the lips and convert them into sounds, enabling people to make private calls without disturbing others or assisting those who have lost their voices. Your handset would interpret the movements of your mouth by detecting muscle activity rather than producing any sounds, and then translate these movements into speech that the person on the other end of the conversation can hear. It basically scans your lips, then.

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