

Alternate Speech System for Dumb People

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Abstract- People who suffer from the ability to speak undergo many challenges than we normal human beings face. They cannot express their thoughts properly and feel inferior in spite of their bestowed beautiful intelligence. They cannot express it naturally in their way they wish which leads to complexity and makes them undergo stress in public meetings and public places. Around the world Sign language are not that effective too, so we have developed a system for dumb people to eliminate the problems they face in an effective manner using labview. Our aim is to provide a stable speech system using Lab VIEW software transmitting data's wireless. This is done by acquiring the brain signals of the dumb people by placing the surface electrode or sensors (wireless) in their respective speech centres of the brain. Where these signals are been acquired by the DAQ (data acquisition system) and sent as analogy input. By comparing their level of the obtained waveform with respective to the original one acquired from a normal able person using VI programming the moods of the concerned person and a relative voice output is been produced. This LABVIEW software is been incorporated in mobile phones using FPGA (field programmable gate array) for developing a portable device.

Keywords- *Wireless network, surface electrode, DAQ, LAB view software, mobile phone.*

I. INTRODUCTION

There are nearly about 10 million dumb people in this world. One of the earliest written records of a sign language occurred in the fifth century BC. In Plato's Cratylus, where Socrates says: "If we hadn't a voice or a tongue, and wanted to express things to one another, wouldn't we try to make signs by moving our hands, head, and the rest of our body, just as dumb people do at present." It seems that groups of deaf people have used sign languages throughout the past. There are many disadvantages in this sign language. The one which can be underlined is, all the people in this world would not know the sign language and the person using the sign language have to be within line of sight, so that conversation in sign language can be understood. To overcome all this problems we came to a conclusion of making the dumb people to speak like a normal able person by producing a voice output of what they relatively try to speak in proper confined words based on their brain waves. So we attached a button sized 16 tiny surface electrodes

to the speech centres of the brain of an able person and collect the brain wave formats of their basic human thoughts as they speak or asked to repeatedly read each of 10 words for instance that might be useful for the dumb person: yes, no, happy, sad, hungry, thirsty, hello, bye, more and less are some of the words frequently used by a person. Then we should make him to repeat the words to the computer and it was able to match the brain signals for each word 76 per cent to 90 per cent of the time. So we keep that as a reference signal for comparing it with the wave form of dumb people.

The sensors wired/wireless were attached to the surface of the brain depending upon the cost but using a wireless would be an efficient one than of wired because wireless would overcome the problems faced by the wired one such as noise, data traffic etc. Using a wireless one can reduce complexity and eliminate the problem in the system faced with a wired device.

The reference signal is got from a person who is made to speak with the waves capturing system attached to his head and is used as the reference signal. Because just thinking a word and not saying it is thought to produce the same brain signals for dumb people as a normal person because, the brain of people who are dumb are often healthy and produce the same signals as those in able bodied people, it is just they are blocked by injury from reaching the muscle.

However, our systems can monitor brain activity of freely moving subjects outside of laboratories, so sensor data may be affected by head movements, they become a problem when present at a fairly gross level. This should be contrasted with sensor where movement over 3mm will blur the image. Because of the lack of consensus in the community, we investigated the artefacts associated with head movements during typical computer usage to determine their effect on sensor data in a typical HCI setting. In order to avoid the artefacts we use a wireless sensor to avoid the complexities.

So the obtained signal is been acquired and compared with the reference one and the relative voice output is produced using a voice array which is been incorporated in mobile phones. We can even produce a relative voice output of what we text in our phones for more easy usage in need of saying a bigger message.

II. WORKING

The system setup consists of the following: Surface electrode, RF transmitter and receiver for transmitting and receiving the signals wireless, MY DAQ 6009, Pre-amplification unit, power supply, Voice array and a mobile phone incorporated with LABVIEW software in it. In order to fix the operation initially, a PC and a data acquisition (DAQ) card are used. The DAQ used in this is MY DAQ 6009. The DAQ 6009 plays an important role in acquiring the signals from the sensor wirelessly and then incorporates the signal into the LABVIEW and produces the relative output of the dumb person generally through a voice array by comparing it with the reference signal incorporated in LABVIEW and as the output of the sensor is weak the signal is amplified using a pre amplifier unit. In our proposed paper the lab view is been incorporated in mobile phones, as we can't carry our pc all the way we move so it would be better if the required system is handy in nature and even for reducing outer circuit complexities mobile phones are used and they themselves have a voice array to produce a voice output with storage capability, so mobile phones are used for handy and easily portable purposes.

The LABVIEW incorporation inside mobile phones is been mainly done using FPGA (Field programmable gate array) which plays a major role and thus mobile phones acts as a PDA instead of a pc to obtain the desired voice output.

III. WIRELESS FUNCTIONALITY

The idea presented in the paper is the incorporation of wireless sensors in it for better transmission and to avoid complexions, we include mainly two important concepts to avoiding noises and safety purpose. For this purpose, modulation techniques such as DSSS (Direct sequence spread spectrum) and FHSS (Frequency-hopping spread spectrum) are used in transmission. In DSSS technique the transmitted signal is made to take up more bandwidth than the information signal that is being sent. Doing so will help us protect the information from unauthorized access or noise as there is no way to find out the particular frequency that carries the information. The FHSS is a method of transmitting radio signals by rapidly switching a carrier among many frequency channels, using a pseudorandom sequence known to both transmitter and receiver. This technique of hopping the information from one channel to the other enhances the transmission quality by effectively managing the traffic in the network and making sure the information reaches the destination as soon as possible.

A. Advantages

- **EFFECTIVE TRANSMISSION** - In wired sensors the presence of wire introduces noise. The transmission of signal from the RF transceiver which is integrated with the sensor, to the DAQ is free of noise since it is done with the help of wireless sensors. Extremely short

telegram transmission ensures high probability of data transmission

- **SIMPLER DESIGN** - Since the sensors used are wireless in nature, the complications in designing the wiring pattern is completely eliminated. Thus it makes the design easy to understand and implement. Usage of wired contacts make it a very complex design so wireless sensors are preferred.
- **SOFTWARE IMPLEMENTATION** -Software used is User-friendly in nature any one can handle it easily and it reduces programming complexity, where Instruments can be virtually rectified in case of problems.

COST EFFECTIVE - The usage of wireless sensors in here makes it cost-efficient for effective transmission

IV. SOFTWARE IMPLEMENTATION

Laboratory Virtual Instrument Engineering Workbench Graphical programming language that allows for instrument control, data acquisition, and pre/post processing of acquired data. LABVIEW relies on graphical symbols rather than textual language to describe programming actions. The principle of dataflow, in which functions execute only after receiving the necessary data, governs execution in a straightforward manner. The block diagram window holds the graphical source code of a LABVIEW VI – it is the actual executable code. You construct the block diagram by wiring together objects that perform specific functions. The various components of a block diagram are terminals, nodes and wires. In here we use an signal comparator to compare the two signals and produce an relative output if the two signals match each other .where the program for this comparison is been encrypted in LABVIEW software and the output produced is been given as an input to voice array for producing the relative voice output.

The method of working is based on simple steps. The signal from the surface sensor placed in the speech centers of the brain acquires the brain signals when generated and coupled to the amplification unit to amplify the week signals obtained from the sensor. After amplification it is been filtered to remove the unwanted signals and then the filtered signal is fed to LABVIEW program , using an RF transmitter and receiver which is used to transmit data's from the sensor to daq. The frequency of the obtained input signal is compared with the frequency specified in the program, that is the reference frequency of the reference signal and if they match, they produce the required voice output using a voice array which is been incorporated in mobile phones. Our response to those questions where ,we took all practical considerations and worked on it and used wireless as a component to avoid many complexions and used NI Lab VIEW environment for interfacing with any hardware measurement simple, besides quickly acquiring and generating signals through wireless using RF transmitter and receiver and as well as allowing

configuration-based data acquisition. My DAQ 6009 plays a very important role in interfacing the wireless sensor to NI Lab VIEW software for carrying further executions. One of the specific capabilities of my paper is LABVIEW been incorporated in mobile phones using FPGA for handy and portable purpose and the other one is transmitting signals wirelessly to avoid complexity is another specific point to be noted.

The indication of the presence of the voice output produced will help the dumb people to have an easy communication in this social environment.

Hence a new system which is highly flexible cost efficient and better than the previous methods has been developed and open new doors for dumb people in the forthcoming environment.

A. Figures and Tables

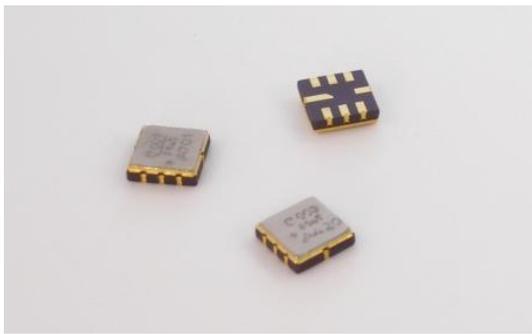


FIGURE .1 WIRELESS SURFACE SENSORS

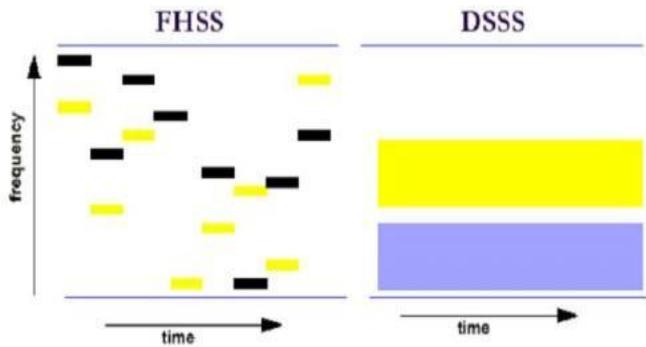


FIGURE .2 FREQUENCY HOPPING METHOD

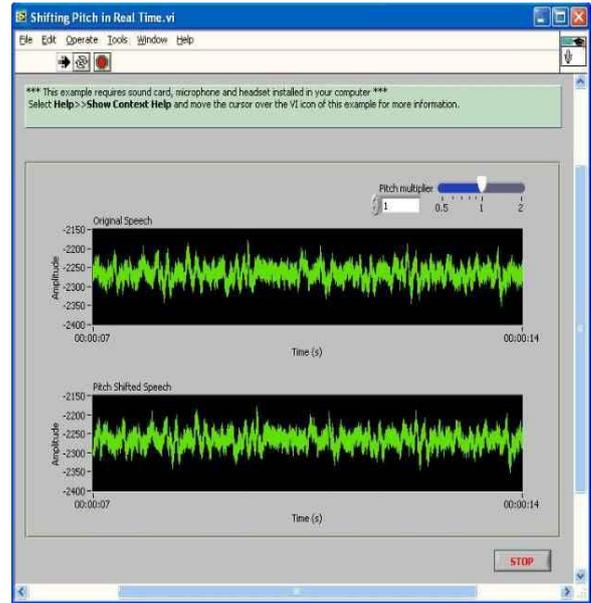


FIGURE 3.COMPARISON OF REFERENCE SIGNAL WITH ACQUIRED SIGNAL

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