Helping Hands: Enabling the Disabled

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Abstract— A major community in the world population is of physically handicapped and blind people. These people cannot access the computers due to their disabilities. There is a need of some technology which allows these people to get access of the mouse and keyboard without using hands and eyes. This paper gives us the brief introduction of a technology which is intended to help handicapped in getting access of the basic technologies.

This technology uses the head mouse technology by which the real time head movements of the computer user is translated into a directly proportional cursor movement of the computer mouse. This technology also provides an interface for the user to handle the click event of the computer. A handicapped user can access the mouse of the computer without using hands. The other module of this system is the speech recognition technology which allows the computer user to give commands to the system by using the keywords specified in the natural language. A blind user can give speech commands to the computer allowing him to access different applications of the computer. This system also provides a screen reader to the user which can read different documents, internet files, emails of the user.

I. INTRODUCTION

According to a recent survey, there are 650 million handicapped people across the globe. Moreover, there are 39 million visually challenged people and 245 million with low sight. Due to these challenges, these people cannot reach up to the basic technologies. In this cyber world computer has become the basic necessity of life. There are 900 million to 1 billion computer users in the world. In this Computer era, due to physical inability such a huge community is deprived of computer usage and internet. There is a need of some technology for these people which will help them access the computers effectively. In this paper we will be giving a brief description of a technology which is completely dedicated for helping handicapped people.

The Head mouse translates natural movements of a user's head into directly proportional movements of the computer mouse pointer, so as the user moves their head the mouse pointer on the screen also moves. The Head mouse has a wireless optical sensor which tracks a tiny disposable target that is worn by the user in a convenient location on their forehead, glasses, hat, etc. It works just like a computer mouse, with the mouse pointer being moved by the motion of

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the user's head. The Head Mouse will track the user's head with the user located in any comfortable viewing position relative to the computer display. Resolution of the Head mouse is precise to allow a user to control the mouse pointer down to the minimum, pixel perfect, resolution of the computer display. This precision allows a user to perform such tasks as drawing, gaming, graphics work.

Voice recognition is an alternative to typing on a keyboard. Put simply, you talk to the computer and your words appear on the screen. It can provide a fast method of writing onto a computer and can help people with a variety of disabilities. It is useful for people with physical disabilities who often find typing difficult, painful or impossible. Voice recognition software can also help those with spelling difficulties, including users with dyslexic, because recognized words are always correctly spelled.

Screen Reader is the software program which can read the documents, internet files and e-mails for a blind user. It reads the complete text present on the computer screen in a synthetic voice.

II. EXISTING METHODOLOGY

There have been many innovative systems that are using head mouse technology for functioning of the computer. We will be introducing some most popular technologies in this paper. The Tobii-Lenovo concept laptop is the world's first laptop with integrated eye tracking. Built by computer manufacturer Lenovo, the laptop is a fully functional conceptual prototype. Using our eyes to point, select and scroll is completely intuitive and complements traditional control interfaces, such as the mouse and keyboard, in a very natural way. For users, eye control is thrilling and makes computer interaction more effective. It is as if the computer understands you.
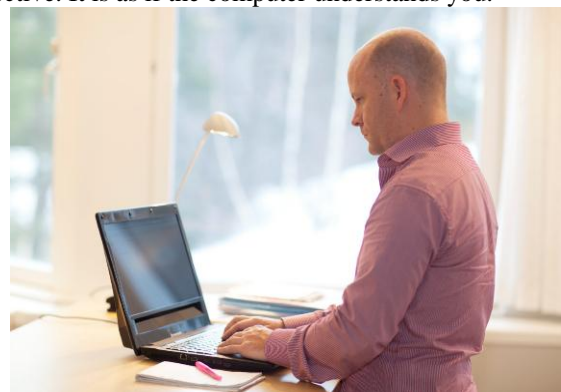
An Excellent speech recognition software for giving commands to your computer using speech is the dragon naturally speaking. NaturallySpeaking uses a minimal user interface. As an example, dictated words appear in a floating tooltip as they are spoken (though there is an option to suppress this display to increase speed), and when the speaker pauses, the program transcribes the words into the active window at the

location of the cursor (Dragon does not support dictating to background windows). The software has three primary areas of functionality: dictation, text-to-speech and command input. The user is able to dictate and have speech transcribed as written text, have a document synthesized as an audio stream, or issue commands that are recognized as such by the program. In addition, voice profiles can be accessed through different computers in a networked environment, although the audio hardware and configuration must be identical on both machines. The Professional version allows creation of custom commands to control programs or functions not built into NaturallySpeaking.

SAPI (Speech Application Program Interface) is an application program interface (API) provided with the Microsoft Windows operating system that allows programmers to write programs that offer text-to-speech and speech recognition capabilities. SAPI is the most widely used speech application program interface used today. In the future, Microsoft plans to embed speech technology using SAPI into their operating system.

III. ISSUES IN IMPLEMENTING THIS SYSTEM

One of the major problems in creating a computer system being controlled by a head mouse is the accuracy that is provided by interface. The accuracy of the system depends on the sensitivity of the application in capturing the coordinates of the head of the user. The accuracy is improved by using a web camera with a good resolution.

The distance of the webcam from the user needs to be set such that it gives the maximum accuracy. The distance of the webcam is decided by the resolution of the webcam and the sensitivity of the interface.

Another major problem with the application is the click event provided to the user. There is a need of some mechanism to provide the click event to the user of the system. This event is necessary to get the complete access of the computer.

IV. PROPOSED SYSTEM

The system is divided into 3 sections.

First section involves the" HEAD MOUSE CONTROL" in which the mouse kit will be replaced by the head movement. In the second section we will be implementing "SPEECH RECOGNITION"(SR) ,in which the input to the computer device will be our natural voice and hence computer will be recognizing the particular natural voice using some software program .

The third section we will be having "SCREEN READER" that can be used for reading the contents which are available on screen as well as we can even read the mails which are available on the internet.

These three core concepts of the image processing domain are combined in this system to achieve the maximum accuracy and reliability.
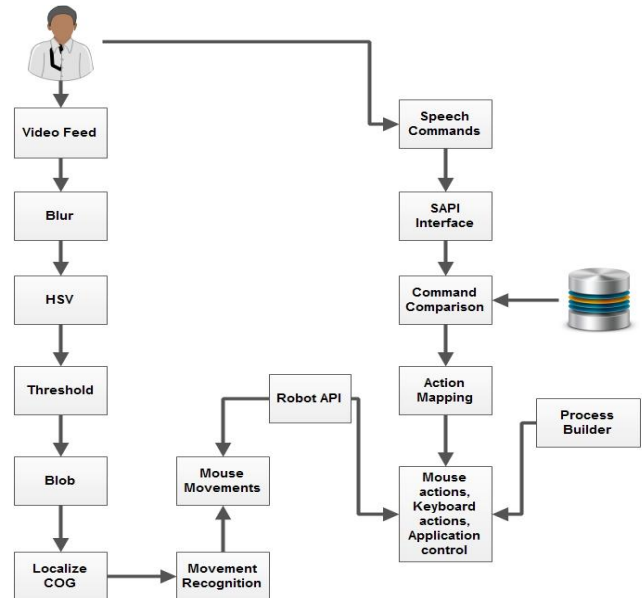
V. CONCLUSION

In this paper, we introduced a technology which is completely dedicated for handicapped people. This system helps handicapped people handle the computer efficiently. Thus, this system has contributed to the welfare of mankind.

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