ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Survey on Flux Sensor Based Text Recognition System.

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ABSTRACT

There are several barriers for the blind people to communicate with the external world through mobile phones or computers. For people with visual disabilities, the mode of Human Computer Interaction (HCI) primitively designed for sighted people are highly inconvenient to use. Different devices are invented to overcome this problem using Braille language. This paper audits some current problems that are frequently encountered when visually impaired people access computer facilities using 'conventional' techniques such as Braille displays, speech synthesis equipment and screen enlargement techniques. Good communication is crucial to our relationships and membership of social groups for them to be satisfying and meaningful. A person, who is deaf-blind or has sensory impairments, depends on communication that is clear, concise and accessible for a good quality of life. They may face great difficulty in knowing for certain what is happening around them or in communicating with those they meet. Deaf-blind people use many different methods of communication. The method or methods used will depend on the amount of residual sight, hearing and any additional disabilities the individual has. It will also depend on whether the individual has learned formal language before becoming deaf-blind.

Keywords: AVR microcontroller, Braille box, Haptic, My VOX

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ISSN: 0975-8585

INTRODUCTION

There can be no doubt that blind people are now relatively self-sufficient when it comes to searching for and reading articles and books presented in electronic formats. A tactile graphic is an image for conveying non-verbal information, which is pictures, maps, graphs, diagrams, and other images, to the visually impaired; it uses raised lines and surfaces so that visually impaired people can feel images. To fill up the gap between the blind people and the technological advancement in the telecommunication field we have decided to design a SMS system for them. We are designing a modular device which is accessible by blind person. For that purpose we are using Braille language. Many disabled people use computers to meet long distance communication needs. Some of the services regularly used are instant messaging, text messaging, Skype or other video and text chatting services, and email with their preferred screen-access software, Braille display and many others for face-to-face communications.

LITERATURE REVIEW

N. Sribunruangrit et al. [1] implemented this project in 2002 to analyze the parallelism concept to access graphic information for blind people. Based upon the parallelism concept more sensors could access the information with more accuracy. By modifying the Braille cell, the Braille Box has been developed to form an array of tactile simulators which is compatible with our fingertip. Each pin can be controlled individually so that we can change the size and type of array to study the tactile discernment of simple and more complex graphical shapes and therefore control the correspondence of inputs in this visual tactile perception device. The result from the experiment with 25 subjects shows us that the quality of perception is influenced by the attribute of array. The form detection is made easier with a multiple sensor array rather than with the mono sensor array. Additional parameters like the strategy of exploration, the type of form, also influence the recognition performance.

Satoshi et al. [2] has implemented communication system between Deaf-blind people and Non-disabled people using Body-Braille and infrared communication to overcome the barrier to communicate between deaf-blind people and non-disabled people. In this system, Braille information is transmitted through any part of the body by two micro vibrators. We have studied many applications such as a telesupport system which supports the daily life of deaf-blind people from remote place with a mobile phone, an independent walking support system by using RFID and “Helen Keller Phone” which supports real time communication among deaf-blind people. Using the body-Braille system the support to blind people is provided by reducing the role of the helper. So the blind people are gradually becoming more independent.

Chao Wang et al. [3] developed accurate Braille-Chinese translation towards efficient Chinese input method for blind people. By using conventional method inputting Chinese into computer for people with visual disabilities have difficulties. In this paper a new approach has been put forward for translation of existing Mandarin Braille to Chinese character. By using characteristics of current approach such as tone information and word segmentation & concatenation rule in the N-gram decoding process, the translating application is able to achieve higher performance than current methods. Besides this, using an article and paragraph translation scheme, language model adaptation is adopted by using combination of N-gram language model and cache-based language mode to improve translation performance. Experimental results show that the overall accuracy for the translation is 94.3%. If proper nouns are not considered, then it can reach 95.1%.

Dominique Burger et al. [4] have discussed some current problems that are often faced when visually impaired people access computer using conventional techniques such as Braille display, speech synthesis equipment and screen enlargement techniques. The project we are going to describe now is intended to put into place some useful tools that are needed for the exploration of the different possibilities that new technology offers to develop multimodal and cooperative interfaces. Two basic aspects of the project are described: technical requirements and the expected results from the research investigation. The technical requirements for the project fall into five basic categories each of which is summarized below. The Workstation Platform will consist of a computer-based interaction environment that will be capable of supporting a wide range of input /output peripherals that are capable of supporting Braille display; speech output; character enlargers; prerecorded messages; vibro tactile outputs; standard keyboard; Braille keyboard; punched cards; barcode material; touch devices; tactile material; mouse; joystick; speech recognition; shape recognition; gestural communication; video input; 3-D interfaces (such as Data Gloves or Body Suit). Temporal

Relationships basic platform that is produced must be able to deal with temporal relationships of the type inherent in the 'put that there' type of interface which was described above. Intelligent Software is important that the underlying software has a level of 'intelligence' that will enable it perform a number of important functions such as understanding input context and selecting the most appropriate combination of communication methods for any given user. If possible, the software must be capable of supporting user modeling. Neural networks and expert systems will form the fundamental building blocks responsible for adding intelligence to the system. Dynamic Versatility The system must be sufficiently versatile to enable it to cater for various levels of user capability and capacity. It must also be capable of handling different levels of expertise and tailor its behavior in a dynamic way to meet the needs of each individual user. User Monitoring for Behavioral Studies in which the system must be able to record a user's behavior so that researchers can analyze the detailed nature of the particular problems that individual users encounter. Expected Results is anticipated that the project we are proposing will lead to a number of important developments with respect to the development of rehabilitation resources for the visually impaired (in particular) and disabled people (in general). The major outcomes that we see are developments with respect to: experimentation of new interaction methods; behavioral studies; guidelines production; standardization of non-visual interaction methods; faster development process through quick prototyping; new applications - possibly to other types of handicap.

B.Ando et al. [5] have implemented a haptic solution to assist visually impaired people in mobility tasks. Electronic handouts are used for detecting obstacles, identifying services and gathering useful information from the surroundings thus activating a safe and effective exploitation of the environment. A Haptic device is aimed to provide the user with information on the presence of obstacles inside the environment. The ultimate goal is to reproduce stimuli similar to a traditional white cane without contacting the environment. This study demonstrates the feasibility to convey environmental perception using a natural codification and avoiding artificial auditory or unnatural tactile categorizing. In addition to this, the sensing architecture allows for obstacle detection without sweeping the cane in front from left to right and vice versa. The results obtained with blindfolded normally sighted users encourage further efforts to develop the suggested methodology. Future actions will be dedicated to optimize the active handle (also for left-handed users), and to include new sensors extending the system functionality in terms of environment perception and tilt estimation. And also testing with the visually impaired is necessary.

Fernando Ramirez-Garibay et al. [6] developed project called My Vox Device for the communication between people: blind, deaf, deaf-blind and unimpaired in the year 2014. This paper presents the prototype of a portable keyboard and speaker device with a refreshable Braille display for the communication between two disabled people that has both, a comparatively low cost, and many possibilities for further development on the ARM-based computer system. We have presented a device for the communication of deaf blind people. While their lack of hearing and sight could represent a limitation when communicating with others, technology is presented that can be of use for communicating with others who do not speak sign language. The communication device, named My Vox, has proven to be a useful tool for an Usher syndrome patient who is now able to communicate with others without the need of an interpreter. Based on his feedback, we are developing an upgraded system that will also be tried by a larger population of deaf-blind users. Our deaf-blind collaborator currently uses the device everyday with his family and friends. During the work on first prototype and while testing it, we became aware of several features and possible improvements that can be implemented in the next version of the system. Internet: By harnessing the capability to access Internet through the ARM-based computer, we can provide a wider range of applications and access to information than go beyond the current in-person communication. Applications: Along with Internet access, the users could install custom applications that can be developed by anyone and made available online. Examples could range from new languages (for speech synthesis, Braille contractions, etc.) to SMS messaging, even books or games. Portability: While the device is currently portable, modification can be made to reduce the size even more and ensure its portability. Braille display: By far, the most expensive component of the system is the refreshable Braille display. We plan to continue our search for a more accessible technology.

José Carlos et al. [7] made a tactile communication using co2 flux stimulation for blind or deaf-blind people. A tactile stimulation system produces non visual image patterns to blind or deaf-blind people. The stimulator yields a CO2 pulsatile flux directed to the user's skin throughout a needle that is connected to a 2-D tactile plotter. The flux tactile plotter operates with two step motor which is mounted on a wooden structure and controlled using a program which produces an alphanumerical characters and geometric figures of

different size and speed. This will be helpful to investigate the psychophysical properties of the tactile communication. Carbon-di-oxide is provided by a cylinder that delivers a stable flux, which is converted to a pulsatile mode through a high frequency solenoid valve. That can chop the pulsatile mode up to 1 kHz. The system temperature is controlled by a Peltier based device. Test made on the prototype shows that the system is a valuable tool to encounter the psychophysical properties of the skin in response to stimulation by CO2 jet. A quantitative and qualitative analysis is used as a function of stimulation parameters. With the developed system, it was possible to plot the geometric figures such as triangles, rectangles and octagons, in different sizes and speeds, and prove the control of the frequency of CO2 jet stimuli.

Li and Cao [9] implemented a privacy aware providing incentives in mobile sensing system. Mobile sensing relies on data contributed by users through their smart phone to obtain useful information about people and their surroundings. Thus, users may not like to contribute due to lack of inducement and concerns on security reason. If incentive and privacy issues are addressed then the users participation can be effectively promoted. In this paper, two credit-based privacy-aware incentive schemes for mobile sensing systems are proposed, where the focus is more important on privacy protection instead of on the design of incentive mechanisms. This system has enabled mobile users to earn credits by sharing data without leaking the contributed data, and ensuring that harmful users cannot abuse the system to earn unlimited credits. Especially, when the first scheme considers circumstances where an online trusted third party is available, and depends on the TTP to protect user privacy and prevent abuse attacks. The second scheme considers scenarios where no online TTP is available. It implies blind signature, a novel extended and semi blind signature. Merkle tree technique to protect users' solitude and intercept abuse attacks. Security analysis and cost evaluations show that our schemes are secure and efficient.

CONCLUSION

Thus we can conclude by saying that with some modifications in conventional communicating devices, we can include large number of physically challenged people in communication system. Blind people have difficulty in communicating with nondisabled people without a helper, but with the help of all these systems we can resolve this problem by using an infrared Braille language and Body-Braille.

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