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RESEARCH ARTICLE

Portable Communication Android System for Disable Person

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Abstract

In this paper we have proposed a system that enables deaf-blind people to communicate and work with android smart mobile phones. The proposed system mobile application utilizes the International Morse Code as a general communication medium. Blind & Deaf person will get Morse code via a vibrotactile device situated in every mobile to see the mobile screen. System enables deaf-blind individuals to receive immediate feedback from their typing and scanning the screen as well. Its value added services provide a means for deaf-blind people to communicate with the normal people through a common medium. Vibration and Morse code is particularly viable because it can be adapted for the individual's sense. International Morse coding suits well in a social facilitation context for understanding. It is technologically very easy and portable. Our system will significantly improve the quality of life for deaf-blind persons because it provides new technology for communication and vocation.

INTRODUCTION

Accompanied by the rapid growth of computer engineering, android smart mobiles are now used widely in a variety of fields. Applications of mobile and various software in training, teaching, learning, and computer assisted instruction are a major future trend. However, most applications are designed for normal persons, and are inaccessible to people living with disabilities, unless extra adaptive tools and interfaces were designed for them [1][4].

Consequently, a current trend in high technology production is to develop adaptive tools for deaf and blind people to assist them with self-learning and personal development, and lead more independent lives. In this study, Morse code, with an easy to operate single vibration input system, selected as a communication device for people living with disabilities like deaf and blind, portable and an easily operated interface provided and an elicit recognition method implemented. The deaf and blind people may be able to receive and make the call, read and write the SMS, add, delete, edit contacts as well as they can use navigation facilities by using the proposed android communication interface system.

Related Work

Samuel Morse created Morse Code in the mid-1800s as a method for long-distance communication. He came up with the idea while a professor in New York City. It was based on the realization that sending pulses to an

electromagnet could be used to transmit signals along a wire. Realising the potential for this device, Morse designed a code that would allow all of the letters and characters to be written using only these on/off pulses. Public support was initially rather sparse [1]. While the first demonstration was in 1938, he was not able to achieve a more comprehensive test until Congress appropriated funds in 1943. These were for the construction of a telegraph line between Baltimore and Washington. In 1944 Morse demonstrated his system with the very first message, "What hath God wrought?" [9] In this original system the dots and dash were read and transcribed by a machine, to be translated by an operator later. It was later modified to allow operators to receive messages as auditory signals. As the technology improved, companies began to utilize the commercial potential of telegraphs. Western Union was formed in 1851 and had built a transcontinental line within 10 years. From there, Morse code just continued to grow, at least until the development of the telephone. Until very recently though, Morse code has been present at least in certain applications [5].

Existing System

Non android mobiles and non-touch screen mobiles used by blind person in previous days by using lines or dots on keypad. So they identify the numbers by using lines/dot on keypad on numbers. By using previous system blind and deaf person can only call or receive the incoming calls. They cannot use the android handset due to physical limitations. Technology means different things to different kind of persons. For some of us, it spells ease and convenient, while for people with disabilities; it is liberating and quite life transforming. It has made them very less dependent on others and has opened up a world of opportunities. The Brail input keyboards and technology like screen readers have made computers and gadgets truly accessible to the visually impaired [2]. But there is one set of people, the deaf blind, who are yet ignored, at least when it related to technology developed for them. As per 2010 survey conducted by Sense International India, there were an estimated 444,000 deaf blind people in India. Pocket SMS [5] makes use of the phone vibrations to denote the Morse codes. The Morse code is the best choice when it comes to binary communication channel like the vibration mode. Explaining the reason behind use of the Morse coding, Morse code is a fairly sophisticated means of communication; it is still widely used and is also available in many languages [10]. It is basically in dots and dashes form, so in the app, a dot is represented by a vibration of short duration while the dash is represented by a vibration of longer duration. When a message will received, every letter in that message will be denoted by short or long vibration depending on its Morse encode symbol [4]. Here again every pause is fixed, like how much time should be there between each letter and how much time should there be between every word is well defined. The previously available pocket SMS application was able to just read out the incoming messages through vibration. It was not able to send messages, outgoing calls and navigation.

Proposed System

We are going to develop an android application using Morse code for deaf blind people using which they can handle touch screen android mobiles. They can be independently make calls, receive calls, type in messages, send messages, add / delete / edit / retrieve contacts in same way as normal human beings. They can also reach at their destination without taking help of any person by using navigation provided in android application. If they forget the path in between they came to know it again using Morse code vibrations in android phone.

International Morse Code

Morse code is a method of transmitting text information as a series of on-off signals, lights, or clicks that can be directly understood by a skilled listener or observer without special equipment. The International Morse Coding encodes the ISO basic alphabet, some extra letters, the numerals and a small set of punctuation and procedural signals as standardized sequences of short and long signals called "dots" and "dashes", or "dots" and "dash"[6].

Each character (letter or numeral) is represented by a unique sequence of dots and dashes. The duration of a dash is three times the duration of a dot. Each dot or dash is followed by a short silence, equal to the dot duration. The letters of a word are separated by a space equal to three dots (one dash), and the words are separated by a space equal to seven dots. The dot duration is the basic unit of time measurement in code transmission. For efficiency, the length of each character in Morse is approximately inversely proportional to its frequency of occurrence in English. Thus, the very common letter in English, the letter "E," has the shortest code, a one dot [1][3].

Mobile Application Propose System Modules

a) *Reading SMS*

For reading SMS that comes to your android mobile phone, this SMS module would take use of Morse code. Morse coding is a method of transmitting textual information as a series of on off tones, lights vibration that can be directly under-stood by a skilled listener without special devices. It is ideal method of message transmission for text disabled. In place of dots and dashes of the Morse code, it uses short vibration and long vibration. Duration period of long vibration is three times the 2 short vibrations. Each vibration is followed by a silence which is equal to one short vibration of smart mobile device, i.e., a dot format.

b) *Writing SMS*

For writing SMS, we provide input by voice commands or by handwritten dialer, using this blind and deaf person can write the message then person enter the number by voice input or by writing number using handwritten keypad and able to send messages like sighted person to the intended person.

c) *Call state handling module*

User can select contact from contact list using voice command or handwritten dialler, and also verify the number and name using Morse code vibration. Then user will provide CALL command or we also provide call button on screen using which user make call to intended person.

For incoming call, Morse code is vibrated for that particular number and/or name. Then for receiving call, user can touch anywhere on screen and can communicate with calling party in a well-defined manner.

d) *Navigation module*

Application automatically detects the current location as source and accepts destination from user. Using Google GPS system, shortest path to destination is provided to user. User can read path by Morse code vibrations or the path is also provided by voice to user.

Results and Screenshots of Application

Figure 1. Internation Morse Code.

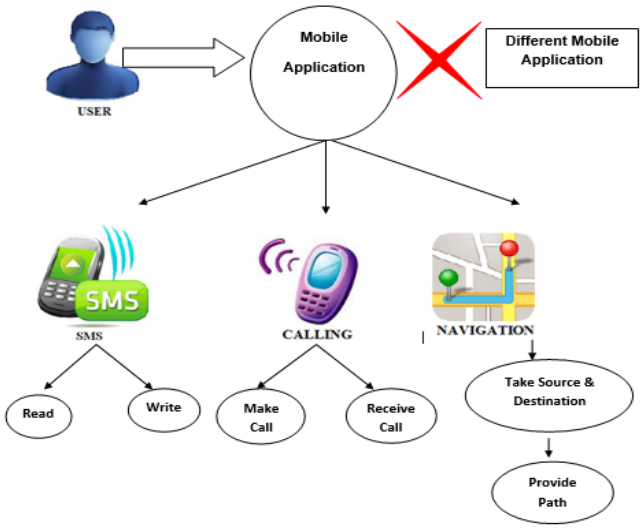

Figure 2. Propose System Architecture.

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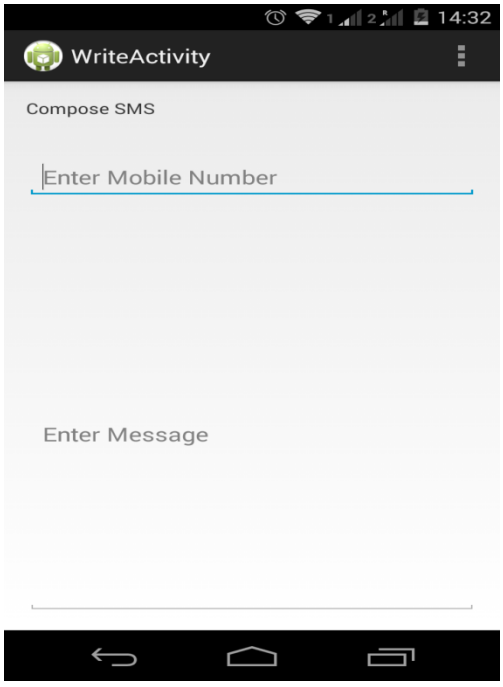

Figure 3. Screen shot of *SMS compose module*.

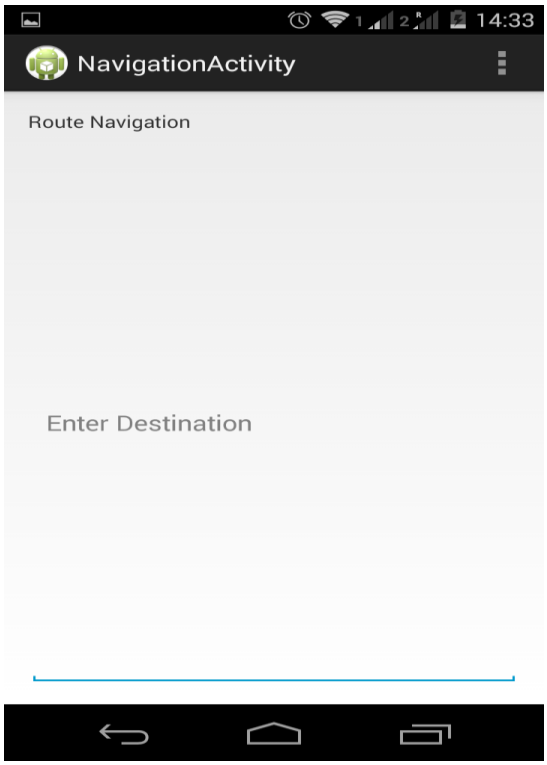

Figure 4. Screen shot of Navigation Module.

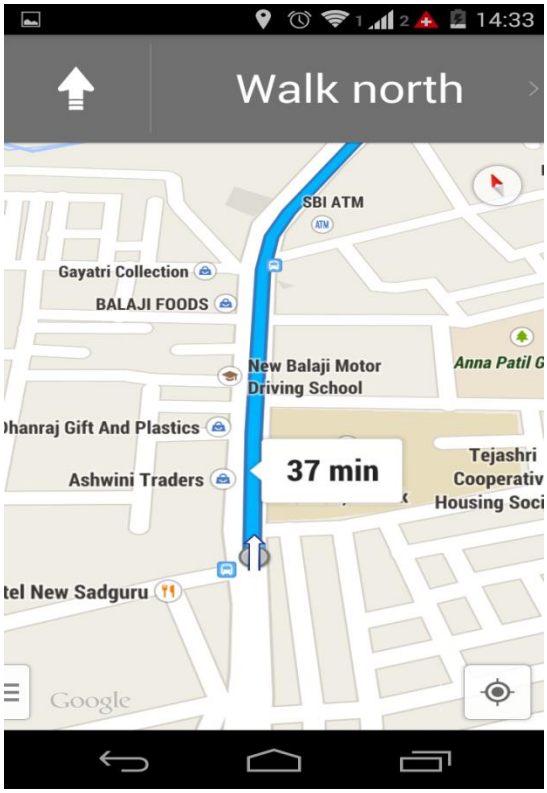

Figure 5. Screen shot of Navigation Module showing route.

It is showing that screen for composing message activity and navigation module which is showing route from source to destination and vibrating that route in Morse pattern.

a) SMS compose module

In this module, user (blind/deaf) will type in the name as well as number by handwritten dialer or by voice input then deaf person click on send button which is provided at right corner of screen or double click on the screen to send the message and the blind person click anywhere on screen to send message. This module uses vibration facility provided in almost every mobile phone difference is just that vibration is done according to Morse code for each and every character in message to read and write the message. It runs on mobile phone having Android platform. All coding is done in Android for the module

Conclusion and Future Scope

The System, which we are developing, is in need for deaf and blind people to use the touch screen Android based mobile phones. This system is very helpful for blind and deaf person. Using this system they can communicate like a sighted person. It allows visually impaired & hearing impaired individuals to send and to read text messages from their phones. This project is helpful in creating a tiny window into a dark and silent world of deaf-blind to find ways for them to communicate, to access and produce a variety of useful information via smart phones.

As today's world is having research on developing android smart phone. So, we have developed the android smart phone app for blind & deaf person because they are not able to use the normal smart phone. Our smart phone app is developing on Morse code using android. The Morse code is the language taught or known to the blind & deaf. The Morse code is the language which is sense by vibration .this language have some symbols for alphabets & numerical & duration of time to be vibrated.

We can develop the overall operating system of an android mobile on Morse code only for the blind & deaf person. This is available for the blind & deaf person so, that they can communicate with each other like normal person. Using Morse code we can also develop the mobile route navigation apps on android smart phone for the blind & deaf person because for traveling from one place to another they need help of normal person but instead of that we can develop the maps for the blind & deaf person on android using Morse code which will tell the route in vibration from source to reach the destination without any help of anyone. In this way our system will be applicable for the blind & deaf person in future.

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