

Text to Braille Language Converter

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ABSTRACT: The visually impaired form an integral part of our society. The National Census of India has estimated around 21.9 Million disabled people in the country. Out of them, more than 15 million people in India are blind. This is the highest among all other disabilities. Three out of every five disabled children in the age group of 0-9 years, have been reported to be visually impaired in India. Due to their disability, visually impaired people face difficulties in gaining full advantage of computers. With the rapid evolution of technology, researchers have proposed to give the blind an ability to take advantage of these advancements. Accordingly, designers and engineers have started working on projects that relate input and output devices to computers for the visually challenged individual to have full control of the machines. The project's objective is to design and develop a Braille System and output devices for the visually impaired individuals that enable them to interact and communicate. This study proposes an algorithm which enables the user to convert the text that we normally have in our day to day usage into a Braille Script and thus facilitate the visually impaired. The Product that has been created is an intuitive and simplistic design that will enable the end user to comfortably read.

KEYWORDS: Braille, Technology for the visually impaired, Braille System

INTRODUCTION: The telecommunication technology has become the integrated part of our day to day life. It has completely revolutionaries the way we communicate, especially long distance communication. It began with the introduction of telegram, followed by telephones. Then it was overtaken by the advanced telephone systems. Then there came the age of mobile communication which facilitates a great deal to communicate on a go. Mobile cell phones are the milestone in telecommunication technology. Despite of all these advancement in the telecommunication field, the physically impaired people have limited access for these technologies. So as a step to bridge the gap between the blind people and the technological advancement in the telecommunication field we decided to design a SMS system for them. We are designing a modular device which is accessible by blind person. For that we are using Braille language as the basis of the project. Blind people use the Braille language for reading and writing purpose. Till date they conventionally use Braille books. But it is not an economical way of communicating now a day. It has limitation on the maximum number of words per page and pages per book. So we are interfacing Braille pad with the cell phone so that impaired person can have the access to the SMS system. We are also providing voice announcement system with it as extra feature.



Fig. Braille Books

MARKET SURVEY: The latest software's which are present in the market for differently disabled people, are generally screen reader software's which forces them to use the keys on keyboard. For sending the message they need to type the message manually and remember the keys by him. But these techniques make it very difficult for them to use those software. Now in the technological world smart messengers are available in Android market which is based on voice to text transmission. Which is also known as instance messenger in that, if you want to send message, speak that message, ultimately message will be converted into text and sent as SMS.

BASIC BRAILLE CELL : A Braille Cell is made up of six dots that fit under the fingertips, arranged in two columns of three dots each. Each cell represents a letter, a word, a combination of letters, a numeral or a punctuation mark. In Braille, an alphabet is made up by a combination of six dots. Each character in Braille consists of one or more (to a maximum of six) raised dots. The position of the different dots represents the different letters of the alphabet. The first ten letters of the alphabet are formed using the top four dots (1, 2, 4, 5). Adding a dot 3 makes the next ten letters and adding a dot 6 to that makes the last six letters.

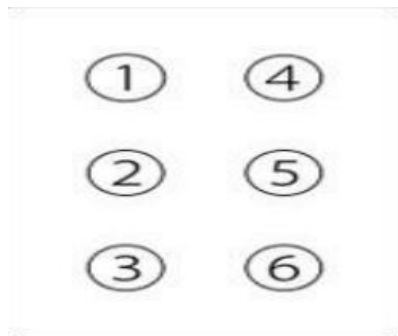


Fig. . The Braille Cell

GRADE 1 BRAILLE:

A Braille letter is by default taken to be in lower case. To indicate an uppercase alphabet, the capital sign is put in front of the Braille letter. .Dot height is 2 approx. 0.02 inches (0.5 mm); the horizontal and vertical spacing between dot centres within a Braille cell is approx. 0.1 inches (2.5 mm); the blank space between dots on adjacent cells is approx. 0.15 inches (4mm) horizontally and 0.2 inches (0.5mm) vertically. A standard Braille page is 11 inches by 11.5 inches and typically has a maximum of 40 to 43 Braille per line and 25 lines are there in a Braille sheet.

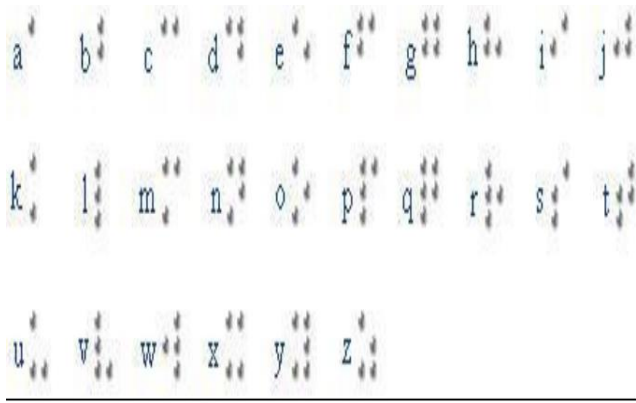


Fig. Basic Braille Script

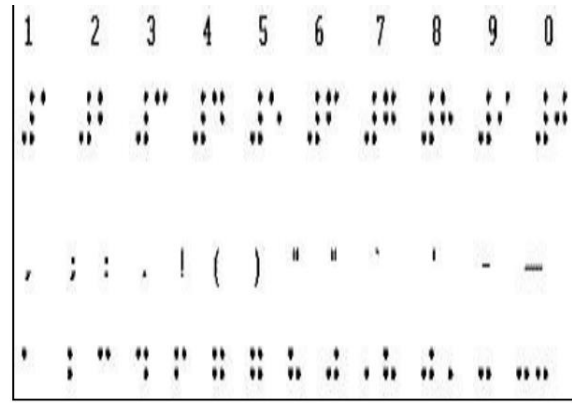


Fig. Braille for numbers and punctuation marks

System architecture:

BLOCK DIAGRAM DESCRIPTION:

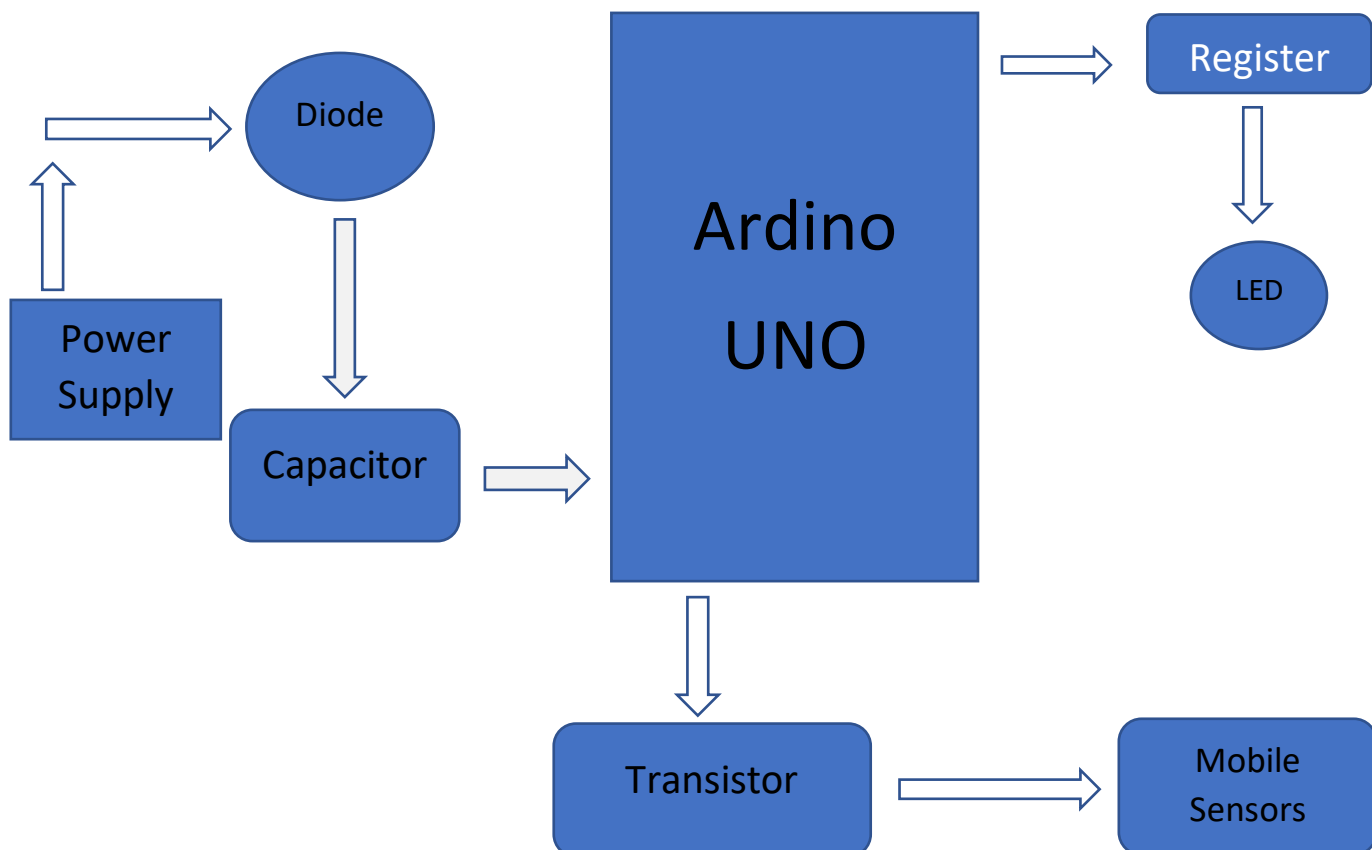


Fig. Block Diagram of Braille Embosser gadget

The text message that needs to be printed is input to the GSM module as a simple text document. GSM module helps the text to be converted into electrical signals (corresponding to the interpretation of individual alpha-numeric in Grade-1 Braille). An Assembly level program for processing these signals and giving directions to them is burnt on this microcontroller.

A motor driver and is connected to the output apart from 6 relays which switch on and off the connection between the solenoid valves and the microcontroller as and when required (i.e. if the 2nd dot needs to be pricked the corresponding relay stays connected while the remaining are open). When the circuit is closed, the windings in the solenoid valve are energized. The objective of this project being printing (pricking) in Braille, which configures 6 dots simultaneously, 6 needles are connected to the solenoid valves. The energized valves force the needles in a downward direction thus making the needed pierce onto the paper. The motor helps to adjust the paper when the extreme right is reached during printing.

Power Supply Design: Power Supply is first and most important part of our Project. There are many types of power supply. Most are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can be broken down into a series of blocks, each of which performs a particular function.

SCOPE OF THE WORK: There are a lot of translation software available for conversion of English text to Braille, but some lack certain features such as the ability to change the translation grade and are also very expensive. Their license costs anywhere between three hundred to thirteen hundred dollars. There are free translation software packages which are available, but they also possess a limiting factor, they do not allow the user to format the Braille text or have multiple grade translations within the text itself. The software does not allow the user to have multiple languages for translation within a document. Most of the Indian languages like Devanagari, are not available. Translation for special symbols and diagrams are also not possible. In our project, we are emphasizing on a specific Font and size. We take the input as any font, size or character and then compare it with the features already stored in the database. Latter part can be feature extraction, which will compare all the features of input with the database and if the feature matches, then the corresponding object in the database is the required output of the system.

Conclusion: Thus we can conclude that with some modifications in conventional communicating device, we can include large no. of physically challenged people in communication system.

References:

- 1) Arduino and Solenoid Valve-Based Text to Braille Converter A V Hemanth, K Sai Bharadwaj, Prasanthi V, M.E.Harikumar, Rolant Gini J Proceedings of the Third International Conference on Smart Systems and Inventive Technology (ICSSIT 2020)
- 2) Automatic System for Text to Braille conversion. Adrian Moise, Gabriel Bucur, Chistina Popesque. 2017 9th International Conference of Electronics Computer and Artificial Intelligence.
- 3) Automated Conversion of English and Hindi Representation M Singh, P Bhatia. International Journal of Computer Application July 2010.
- 4) Text to Braille Converting Device For Visual and hearing impaired people

