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Braille Script Translator

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Abstract: ***The significance of interpersonal communication is examined in this study. Blind individuals utilize a variety of writing systems, including Braille, which bears the name of its creator, Louis Braille. By lightly pressing the raised dots on the Braille sheet with the tips of one's fingers, one may read the Braille script, which varies depending on the language.***
There is a Braille to Text/Speech converter available for blind persons who struggle to read due to visual impairment. The objective of this project is to create a system that can generate speech and text from images that have been transcribed in Braille. It applies to everyone.
Keyword: Speech, text, language, Braille script, blindness, visually handicapped.

I. INTRODUCTION

The significance of interpersonal communication is examined in this study. Blind individuals utilize a variety of writing systems, including Braille, which bears the name of its creator, Louis Braille. By lightly pressing the raised dots on the Braille sheet with the tips of one's fingers, one may read the Braille script, which varies depending on the language. A Braille to Text/Speech converter is available for blind persons who struggle to read due to visual impairment. The objective of this project is to create a system that can generate speech and text from images that have been transcribed in Braille. It applies to everyone. Speech, text, language, Braille script, blindness, visually impaired. There are six dots, two vertical rows of them. Six dots are arranged in two vertical columns to form a rectangular grid called a braille cell.

The dots are uniformly spaced from top to bottom in the left column (1, 2, and 3), and 4,5 and 6 in the right column. The exact placement of raised or flat dots within the cell might provide information about a person's personality. There are 64 possible characters since any one of the six dots might be raised or not. It uses the whole set of 26 English alphabets as well as punctuation, numerals, and other symbols.

Braille serves as a code that may be used to represent characters from other languages even though it is not a spoken language. A number of techniques, including embossing or printing on specific paper, can be used to create braille. To read the characters by touch, braille readers place their fingertips on the dots on the braille paper.

A slate and stylus or a braille typewriter can be used to write braille by those who are fluent in the language. A sharp-tipped stylus and a metal plate with evenly spaced indentations make up a slate. The raised dots used in the drawing may be made by sandwiching paper between a slate and applying pressure with a stylus to the corresponding indentations. To read Braille characters, one typically sweeps their fingertips over them. They decode the characters by using their knowledge of the braille code and their fingertips to feel the raised dots. Braille may be read by those who pick up the various dot patterns rapidly. It's also crucial to recognize how technology advancements have simplified the usage of digital displays and other devices that may produce braille text. Technology has advanced, making braille more adaptive and available.

In general, the braille system is necessary for allowing blind or visually impaired persons to read and write independently. They can communicate more effectively, connect with textual material more easily, and travel with greater assurance and independence.

II. PREVIOUS WORK

This survey article offers an assessment of the most cutting-edge braille input techniques at the moment. In this part, we give a thorough explanation of the issues that arise when visually challenged persons utilize these methods. Based on the results of the current survey, we have determined new directions for future study.

Numerous experiments have been done recently to improve braille's technological assistance. We have roughly separated the braille input mechanism into two groups for the purpose of analyzing these studies:

1) Scanned Input
2) Touch-screen-based Input

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a) Scanned Input: In the scanned braille input, braille dots are extracted from braille sheets using a scanner and then, converted into text using [OCR] Optical Character Recognition as shown in fig 1. In this mechanism, visually impaired users give input on sheets without any interaction with a computing device.

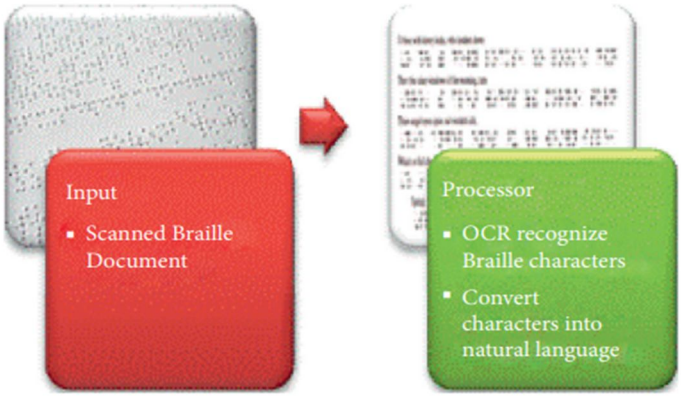


Fig 1: Scanned Braille input.

b) Using a touch screen Braille data is entered using a touch screen in this way. These pictures are contrasted with the braille dataset, as seen in Figure 2. The user is then presented with the matching braille character utilizing a variety of output methods.

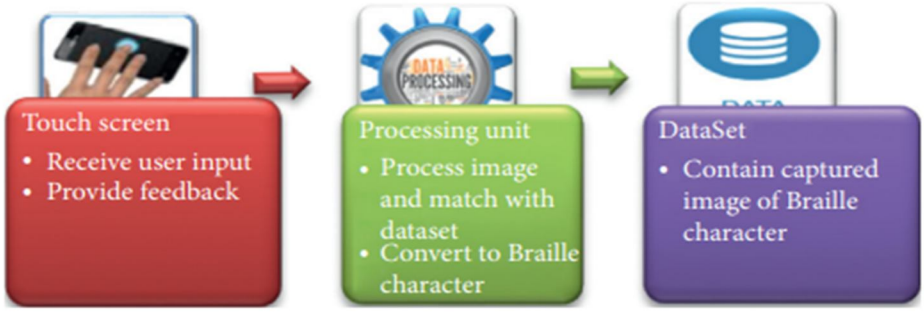


Fig 2: Braille input from a touch screen

III. CONVERSION OF SCANNED BRAILLE DOCUMENT

A. Image Capturing

The procedure you described entails either importing a text image from a source or capturing one with a camera. However, the taken image can have flaws in its size, shape, or general quality, rendering it inappropriate for directly extracting text data.
This is addressed by using an image processing module to improve the quality of the acquired image and get it ready for text extraction**.**

B. Image Processing

An essential component of this project, image processing will be utilized to extract the Braille cells from a photo of braille paper obtained using a mobile phone camera.

C. Noise Filtering

The noise in the captured picture, which occurs naturally, obstructs the image and might lead to errors in the algorithms that are employed later. Mean filter, median filter, and Gauss filter are a few noise filtering techniques. The median filter has no kernel, thus the new picture must be produced by conducting a convolution between each pixel in the original image and the filtering kernel. This is where both techniques diverge.

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IV. SYSTEM ANALYSIS

A. Manual Entry Software System

A computer program called the Manual Entry Software System is intended to make it easier to manually enter data into a computer system. It offers a user-friendly interface and features that let people enter data quickly and accurately.

When manual data entry is necessary, such as when transferring information from paper documents, forms, or handwritten records into a digital format, this software solution is especially helpful. It does away with the necessity for human transcribing and reduces the possibility of mistakes occurring.

To guarantee the correctness and integrity of the provided information, the manual entry software system often provides capabilities like data validation, data formatting, and data verification. It could include customization options, including dropdown menus, auto-fill recommendations, or predefined templates, to meet certain data entry needs.

The software system may also include features to boost efficiency, such as keyboard shortcuts, mass data entry options, or the capacity to import information from outside sources. It attempts to speed up manual data entry, decrease data input time, and increase overall effectiveness. In order to safeguard the privacy and confidentiality of the data input, security measures are frequently used in manual entry software systems. Access restrictions, user authentication, and the encryption of sensitive data are a few examples of this. Overall, the Manual Entry Software System is a useful tool for businesses and individuals that have to manually enter large volumes of data. It facilitates precise and effective data input while automating and streamlining the process, reducing mistakes and saving time.

V. RESULTS

1) *Accurate Translation:* The translator must faithfully convert input text into the Braille script by abiding by the rules and customs of the Braille writing system. The output must be error-free and match the expected Braille representation.
2) *Speed and Performance:* To ensure that customers receive their Braille output as soon as possible, the translator should provide a reasonable turnaround time. The complexity of the input text and the system's processing capability are only two examples of factors that might affect performance.
3) *Usability and Accessibility:* The translator should have a user interface that is straightforward to use and allows for easy text entry and translated Braille output. Additionally, it must have accessibility features like support for screen readers or Braille displays that help users who are blind or visually impaired.
4) *Handling Errors:* When issues arise during translation, the translator should gently address them and offer concise error messages. The procedure must be rapidly corrected in order to resume without losing or corrupting any data.

A. Screenshots Of The Results

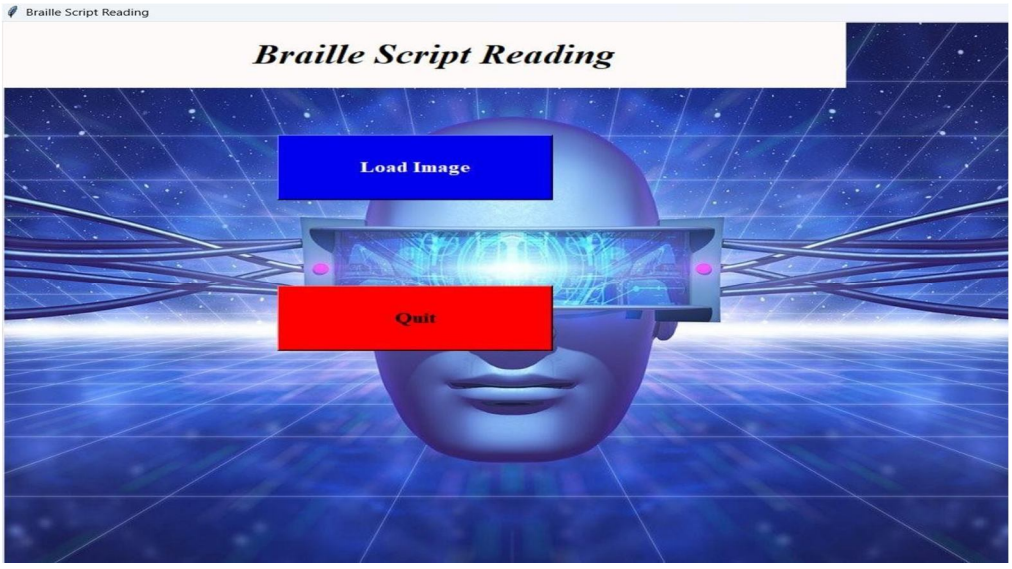


Fig 3: Screenshot Braille Script Reading

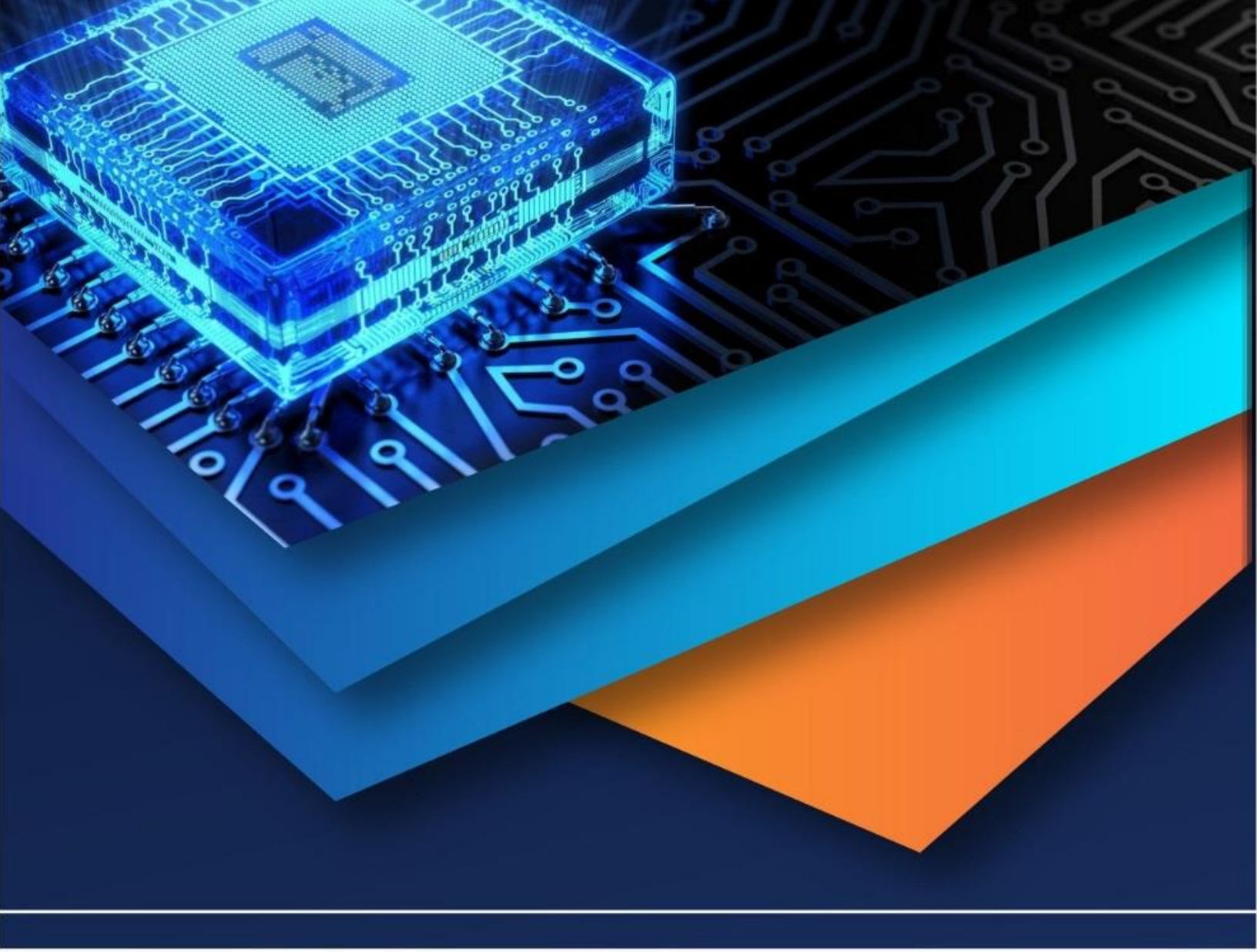
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VI. CONCLUSION

1) A novel, efficient, real-time, and cost-efficient method that lets people hear the text that appears in pictures rather than reading it.
2) It is challenging to understand words included within a picture. Additionally, this approach benefits those who are blind.
3) The major goal of the proposed method is to speak the text included in a picture so that blind people may understand it more readily.
4) Entering Braille Dots on a touch screen requires activating and deactivating certain pixels.
5) After the input is gathered, a number of algorithms process the Braille dots that were recovered and translate them into their corresponding words or letters in natural language. These touch-screen techniques for visually challenged users make use of haptic, auditory, and tactile feedback.

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