

Tri-Lingual translation of Braille

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Abstract Visually impaired people are an integral part of our society. However, their disabilities have made them have less access to computers than the people with clear vision. Over time the Braille system has been used by them for written communication. Braille is a system of writing that uses patterns of raised dots to inscribe characters on paper. It has become the most usual way for blind people to participate in literature culture. So their usage with common scripts in writing is less comparative to Braille scripts. Keeping this in mind, their usage of computers would be more comfortable if Braille enabled keyboards are developed or just if they are simulated on general keyboards. This work is also one such attempt to give visually impaired people more comfort in typing and thereby use the system frequently and get more interactive with computers in day today life.

Keywords —Braille Translation, QWERTY keyboard, Speech Synthesizer, 6-dot representation, Brailier,

I. INTRODUCTION

This work aims to develop a simple Text Editor for visually impaired people through which they can produce documents in English, Telugu and Hindi languages using Braille code or respective Braille Scripts. It provides flexibility of using the system with more ease and comfort by using inbuilt QWERTY keyboard for typing than taking help of any extra hardware support like Braille's (Special Keyboards/typewriters used for typing in Braille code). The application is a basic text editor with features such as converting Braille code (6 dot representation) into specific language scripts as typed from QWERTY keyboard and speech feedback allowing the user to listen to the text they have just typed or from text files. The application also provides a platform for Braille learners to practice and learn more effectively and efficiently.

II. EXISTING SYSTEM

A. Brailier

The traditional method for a blind person to write a Braille document is to type the Braille using a Brailier. A Brailier (Mountbatten Brailier as shown in figure 1) is a mechanical or electro-mechanical device that has around ten keys (6 keys for 6 dots of Braille cell and 4 others for four different purposes). Brailiers' are chord and chord-less keyboards; many Braille characters have multiple raised dots in the Braille cell and hence require between one and six keys to be depressed simultaneously.



Fig 1: Example of Brailier - Mountbatten Brailier

B. Braille S Software

It is a software that has implemented the Braille text editor in its own way with three basic functionalities. It has complex GUI design, more preference is given to mouse buttons than keyboard which provides a problem for visually impaired people in navigating through the software, only character by character speech synthesis is present, improper key mapping is found, only two languages are used without even mixture of languages option and several other problems are found in this software. For all aforementioned reasons, this module needs to be completely redesigned from scratch. The below figure 2 gives the screen shot of Braille-s Text Editor Software.

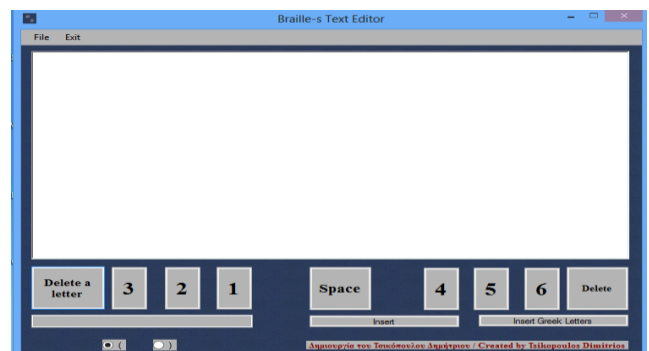


Fig 2: Braille S-Software

C. *Disadvantages of the Existing Systems*

1. Complex GUI Design.
2. More preference to navigation through the mouse than keyboard.
3. Only character by character speech feedback.
4. Available with only one or two languages.

III. PROPOSED SYSTEM

The proposed system will be an application, that is, a basic text editor with features such as converting Braille code (6 dot representation) into specific language scripts as typed from QWERTY keyboard and speech feedback allowing the user to listen to the text they have just typed or from text files. The application also provides a platform for Braille learners to practice and learn more efficiently

Advantages of using such system are as follows

1. False Text Documentation can be done easily.
2. Use of s, d, f and j, k, l keys for Standard Braille input.
3. Braille conversion for three languages English, Hindi and Telugu .
4. Introducing speech feedback.
5. Learning and Practicing can be made easy.

IV. DESIGN METHODOLOGY

The product aims to develop an application for visually impaired people to produce text documents by typing through Braille script using 6 dot representation that is simulated on QWERTY keyboard and also for learning Braille for both sighted people and visually impaired people. It provides flexibility of typing and learning Braille in three different languages like English, Hindi and Telugu.

The application, which is a simple text editor, should include special features that makes it a compatible Braille text editor specialized for visually impaired people and Braille learners. Its features should include

- To write text documents, to open text documents and to save text documents and others features of Simple Text Editor
- Using keys like s, d, f, and j, k, l for exactly executing six dot representations of Braille code.
- Enabling Braille conversion for three languages i.e. English (Grade 1 and Grade 2), Hindi and Telugu.
- Text to Speech conversion for English language.
- Not only for developing text documents but also to practice and learn Braille.

V. MODULES

A. *Text Editor*

Filtering A simple text editor which has menu strip that has various items like open, save, save as, exit, cut, copy, paste, font, background etc. which have their own functionalities. A help option is also present which gives the details of application and guidelines to use application. An input box

in which braille code is typed and a rich Text box where text converted from braille is appeared and read out are the two other main parts of the text editor. Braille to Text Conversion

B. *Braille to Text Conversion*

Using S, D, F and J, K, L keys as 6 keys mapped to 1, 2, 3 and 4, 5, 6 dots of Braille’s 6 dot representation, Braille input is taken and converted to Text according to the standard Braille to general Language conversions. The languages into which Braille is converted into are English, Hindi and Telugu.

C. *Text to Speech Conversion*

One Speech Synthesis is done that enables the user listen to text that is being typed (character by character), already typed (entire document) and new text documents loaded (only for English language texts).

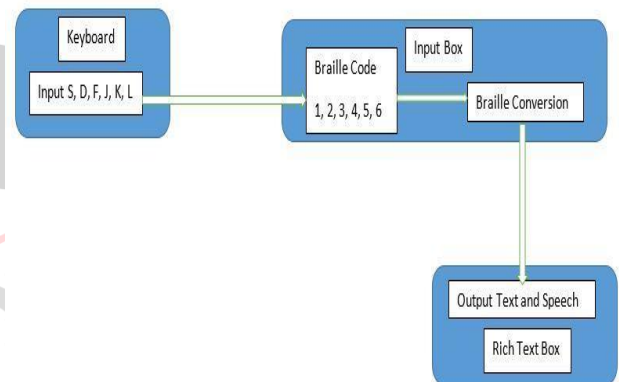


Fig 3: Architecture of Braille Text Editor

VI. RESULTS

Testing is a very important module in software development to verify, validate and provide quality and service for different components of software. It is used to minimize the risks by efficient use of resources in the development life cycle. This module can be employed at any point of the development process. It is efficient for the testing phase to be implemented at initial level to lower down the risks of defects and failures.

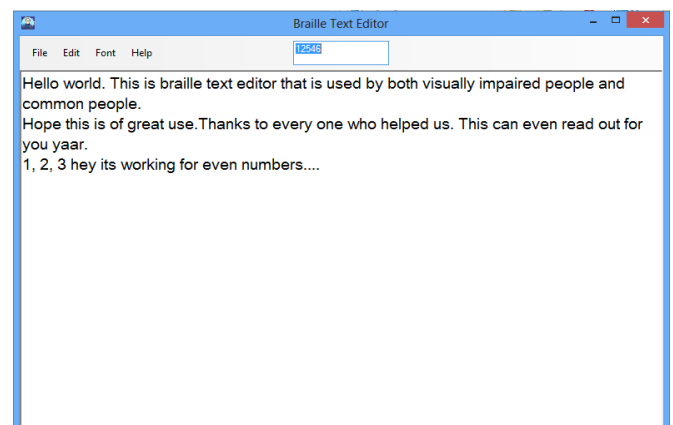


Fig 4: Braille to English Text

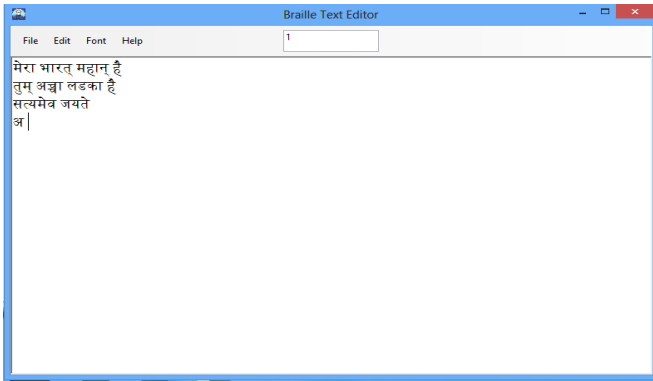


Fig 5: Braille to Hindi Text

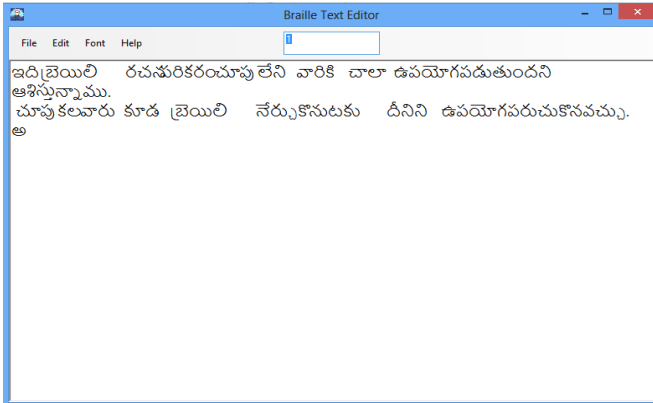


Fig 6: Braille to Telugu Text

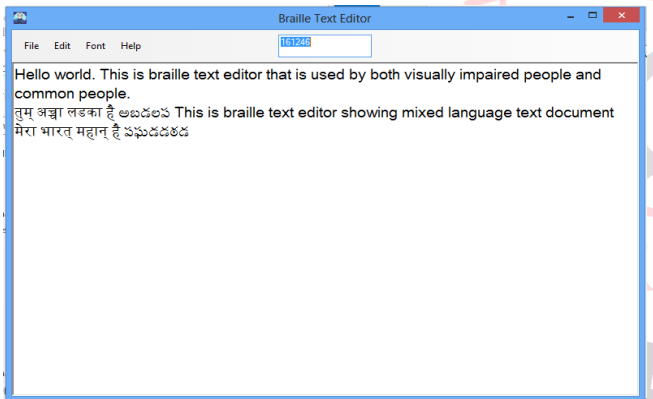


Fig 7: Braille to Mixed Language Text

VII. CONCLUSION

This work aims to develop a simple Text Editor for visually impaired people through which they can produce documents in English, Telugu and Hindi languages using Braille code or respective Braille Scripts. It provides flexibility of using the system with more ease and comfort by using inbuilt QWERTY keyboard for typing than taking help of any extra hardware support like Braille (Special Keyboards/typewriters used for typing in Braille code). The application is a basic text editor with features such as converting Braille code (6 dot representation) into specific language scripts as typed from QWERTY keyboard and speech feedback allowing the user to listen to the text they have just typed or from text files. The application also provides a platform for Braille learners to practice and learn

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VIII. FUTURE SCOPE

- To enable Speech Synthesis for Hindi and Telugu languages.
- To improve for Grade 3 and enable more contractions in English language.
- To eradicate minor issues in implementing Special cases of Hindi and Telugu languages.
- To extend the application to all other Indian languages of India like Tamil, Marathi, and Bengali etc.

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