

# Qualitative Analysis Framework for Converting Braille to Voice using Image Recognition



Archana.M, Dhivya.S

**Abstract**: In our everyday life, we are seeing a great deal of visionless people in our general public. These individuals face challenges with their ordinary exercises, for example, perusing, strolling, driving, mingling and composing. Braille Script is a technique that is broadly utilized by visionless people to peruse and compose. Braille Script is a system that is commonly used by visionless individuals to examine and form. Braille Code generally contains cells of brought spots organized up in a system to etch characters on paper. Trance People can identify the proximity and nonappearance of spots using their fingertips, giving them the code for picture. Its characters are six-spot cells, with segments and three lines. The musing is completed on a present understanding structure united with a constrained state machine with certain setting organizing and elucidation rules. A system is proposed for changing over Braille codes to Tamil voice message executed using Python in Natural Language Processing which can be scrutinized out to various through the PC. In this paper Braille code is expelled from data picture and it is mapped to the Tamil database and held up.

**Index Terms:** Braille Script, Image Recognition, Language Translation, Text Processing, Tamil Language, Speech recognition.

## I. INTRODUCTION

In our society lot of visionless peoples and deaf persons. Those peoples they are facing a lot of difficulties in our daily life such as reading, writing, walking and driving. As a matter of fact Louis Braille is a French teacher refined a plan for visionless people. It is an arrangement of perusing and composing for the outwardly game plans of raised dabs. It spoken to by the letters and numbers can be distinguished by contact. It is valuable for visionless people to effectively relate inside the open exercises. Braille code are first developed in the nineteenth centennial. Braille cells are absolutely six dabs, three lines and two sections.

Braille codes are imprinted in the plain flimsy paper utilizing silently depicting a word. Visionless people are serenely perceived with single touch to distinguish the characters. Fig.1 exhibits a Braille cell with 6 spots and Fig.2 addresses the Braille Tamil character for letter 'ஏ'.

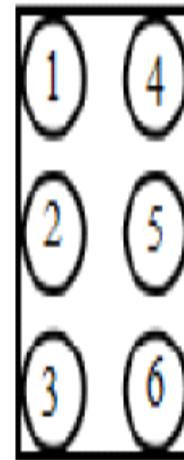


Figure 1. BRAILLE CELL

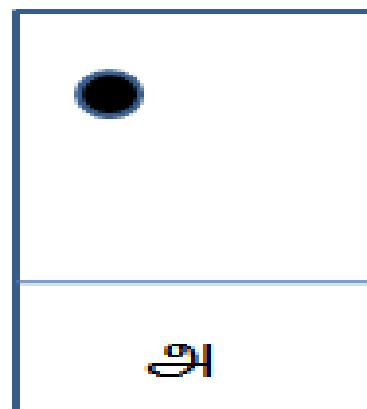


Figure 2. BRAILLE CHARACTER CORRESPONDING TO LETTER 'ஏ'

This paper speaks to a disclosure for separating content from the picture into the editable arrangement it changing over Braille code for Tamil Characters and the editable configuration additionally changed over into the Speech Communication in graphical UI.

## A.TAMIL BRAILLE SCRIPT

It is very useful for visually impaired people to recognise the image extract the object detection converted into the Braille code to Tamil audio output.

Manuscript published on 30 September 2019

\* Correspondence Author

**Archana.M\***, Department of Information Technology, SRM Institute of Science and Technology, Kattankulathur, India. Email: [archana1996it@gmail.com](mailto:archana1996it@gmail.com)

**Dhivya.S**, Department of Information Technology, SRM Institute of Science and Technology, Kattankulathur, India.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](#) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Retrieval Number: B2495078219/2019©BEIESP

DOI:10.35940/ijrte.B2495.098319

Journal Website: [www.ijrte.org](http://www.ijrte.org)



**Figure 3. BRAILLE CODE TAMIL LETTERS**

## II. LITERATURE REVIEW

Numerous scientists have chipped away at contemplating the braille code characters and it is utilized in various dialects. This area will basically investigate a portion of the examination previously conveyed out.[1] Actually in this paper content to Braille changed over Refreshable presentation with the mono cell. In this framework utilizes the computerized correlation calculation for content to braille code character change. It utilizes for the customized content into the material Braille.

[2] In this paper they are using the novel Braille pad with the Dual Text-to-Braille and Braille-to-Text with a joined LCD Display. It shows a novel arrangement of a lower-cost, low-power, Portable and straightforward Braille System.

[3] They present a discourse empowered bidirectional programmed Indian language content to braille transliteration framework. In this framework permits t spanning the correspondence hole between an outwardly impeded people groups. They are accepting the Indian archive as information and dependent on some transliteration rules. It can produce the relating braille yield. In TTS System, it is client can get quick sound criticism from the info content Indian report. They are introduced a sound QWERTY supervisor, it enables an outwardly impeded people groups to peruse and compose the Indian language messages through a system.

[4] A Wearable sensor system for scrutinizing Braille with a post preparing. It is proposed to develop a moderate material sensor framework. The sensor is mounted onto a fingertip and moved over braille physically to obtain the yield.

[5] The programmed framework it is utilized for Text to Braille code change. To show the improvement of a programmed framework used to change over the composed content to the braille language. The framework associated with a unique gadget that can be perused by outwardly weakened people groups. The product based ideas to actualizing the limited state machine has been developed.

[6] Braille code structure is utilized for apparently impeded individuals to examine and write in Malayalam by then changed over into sound. Evidently obstructed social requests can recognize the nearness and nonattendance of contacts utilizing debilitated society can distinguish the closeness and nonappearance of spots utilizing their fingertips, they are giving them the code for picture. The procedure is proposed for changing over Braille codes to Malayalam voice message executed utilizing MATLAB which can be analyzed out through the structure. Braille code is expelled from the data

picture and it is mapped to the Malayalam database and held up.

[7] It investigates a wearable informing gadget that utilizes inserted innovation for outwardly weakened people groups. The Braille content to voice transformation. It has an exceptional console that is incorporated with the braille for the utilization of outwardly disabled people groups and it changes over the message that the individual needs to correspondence with the other individual into a voice to content. In this framework is executed on the open source Arduino stage which makes it increasingly productive and furthermore cost effective. [21] Raja et al proposed multimodel algorithms for image recognition.

[8] Traditional Braille system they are using 8 dots for Braille cell to read the Braille code characters for different languages. They are using the unified Braille Unicode system. It called as Braille-8 code system.

## III. PROPOSED SYSTEM

In the normal structure braille arrangement of expressions of correspondence is changed into Tamil dialects. A gathering of information is made for great portrayal of letters in order. An examined pictures will be given as admission and it experiences picture upgrade, separating and division. In this picture upgrade is accomplished for an unmistakable examining of Braille archive and for power change. Division is for Braille extraction by confirming separation between two cells and sifting is to evacuate commotion. The picture fragments are changed over into letter sets and afterward contrasted and the database. The content got is then changed over into sound signs.

The proposed work plans a minimal effort, compact, easy to understand, self-learn and individual test Braille for outwardly debilitated individuals. It incorporates six rings and six miniaturized scale changes to gain proficiency with the Braille and individual test as recorded as a hard copy and perusing of Braille cells.

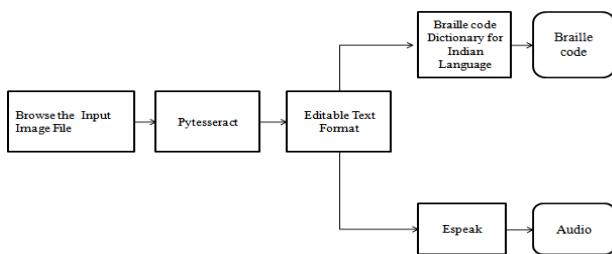
In the normal structure braille arrangement of expressions of correspondence is changed into Tamil dialects. A gathering of information is made for exemplary portrayal of letter sets. A checked pictures will be given as admission and it experiences picture improvement, separating and division. In this picture upgrade is accomplished for a reasonable examining of Braille record and for force modification. Division is for Braille extraction by confirming separation between two cells and sifting is to evacuate commotion. The picture sections are changed over into letter sets and after that contrasted and the database. The content got is then changed over into sound signs.

Braille code work plans a minimal effort, convenient, easy to use, self-learn and individual test Braille for outwardly hindered individuals. It incorporates six rings and six small scale changes to become familiar with the Braille and individual test as recorded as a hard copy and perusing of Braille cells.

It proposes another model for learning Braille all the more successfully by the recently created Braille Fingers Puller. It is fundamentally planned as basic as conceivable to work as an adaptable model.

It is equipped for fruitful and powerful activity for individuals with visual inability. The improvement of the versatile model lies on the information handling yield. Utilizing this essential interpretation method, any language extraction in Braille code should be possible.

Braille code proposes another model for learning Braille all the more adequately by the recently created Braille Fingers Puller. It is fundamentally structured as basic as conceivable to work as an adaptable model. It is fit for fruitful and compelling task for individuals with visual handicap. The improvement of the versatile model lies on the information preparing yield. Utilizing this essential interpretation strategy, any language extraction in Braille code should be possible.

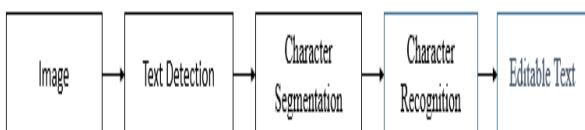


**Figure 4. BLOCK DIAGRAM OF PROPOSED SYSTEM**

Proposed work is mainly classified into 3 sections as

#### **Module A.Image to Editable Text**

In the proposed model we utilize a tesseract has executed a long momentary memory (LSTM).It depends on acknowledgment engine. LSTM is a sort of intermittent neural system. Utilizing the tesseract OCR ideas in python to prepare the Indian language dataset as of now too given the example input model to extricate the Tamil content from the picture.



**Figure 5. IMAGE TO EDITABLE TEXT FORMAT**

#### **Image**

To get the image from the end user. To browse the file from the local using graphical user interface.

#### **Text Detection**

It accomplish optical character recognition. It detects from the image and extract the text with the support of broad range of languages. Text detection also features automatic language detection.

#### **Character Segmentation**

Character Segmentation is an activity that tries to break down a picture of an arrangement of characters into sub pictures of individual pictures. It is one of the choice procedures in a framework for optical character acknowledgment.

#### **Character Recognition**

Character Recognition is a procedure which enables PCs to perceive pictures, for example, letters and to transform them into a structure that the PC can utilize.

#### **Editable Text**

Retrieval Number: B2495078219/2019©BEIESP

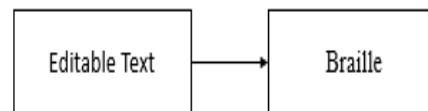
DOI:10.35940/ijrte.B2495.098319

Journal Website: [www.ijrte.org](http://www.ijrte.org)

To extract the text out from the image and converted into the editable format.

#### **Module B.Editable Text to Braille**

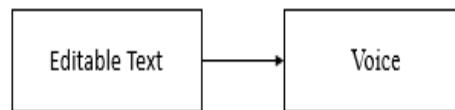
Editable organization content is changed over into Braille code in graphical UI. The individual letters are utilized to contrast and database made. The change of Braille characters to relating Tamil characters is done here. The removed picture is contrasted and the database and comparing Tamil characters are created.



**Figure 6. TEXT EXTRACT FROM THE IMAGE CONVERTED AS A BRAILLE CODE CONVERTER**

#### **C. Editable Text to Voice**

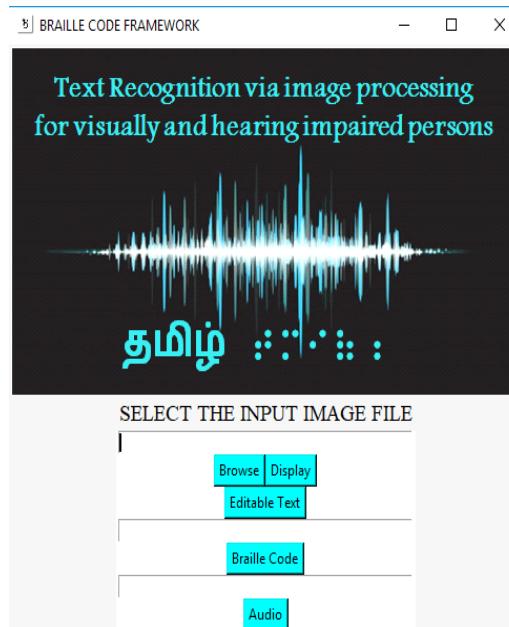
Data reads from the input file convert the voice output as result in natural language processing to hear the visually impaired peoples.



**Figure 7. EDITABLE TEXT TO VOICE**

## **IV. EXPERIMENTAL SETUP AND RESULT**

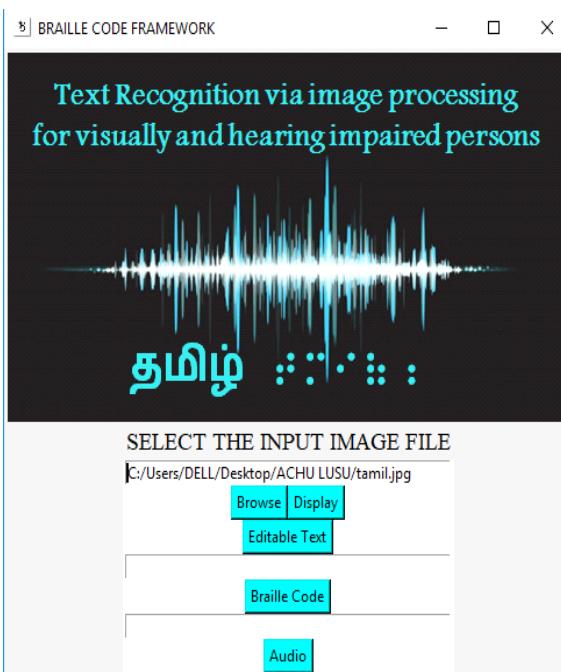
In Graphical User Interface to run the framework of converting Braille to Voice using image recognition.



**Figure 8. BRAILLE CODE FRAMEWORK IN GRAPHICAL USER INTERFACE**

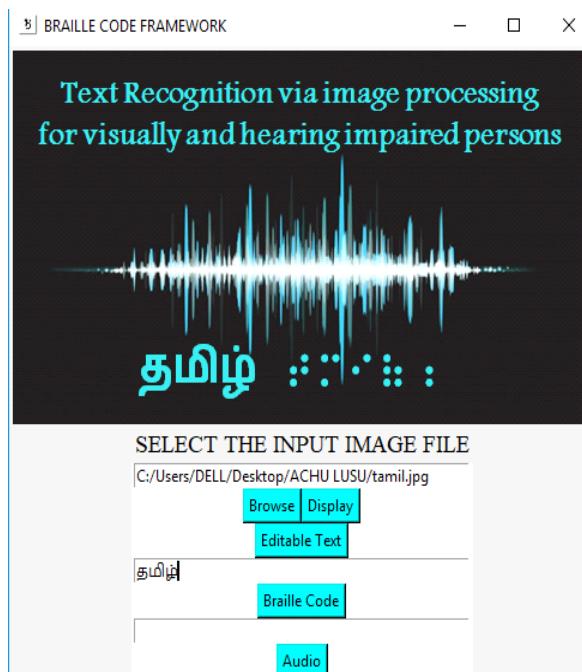
To get the input file from the user and browse the file from the local. To display the image in graphical user interface





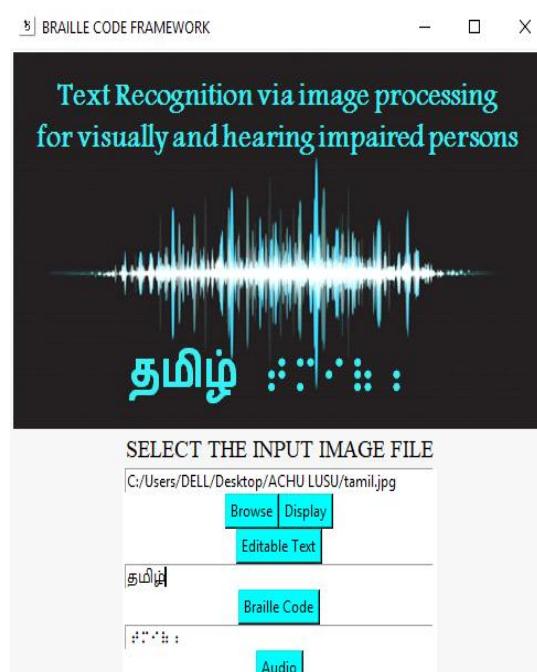
## **Figure 9. BROWSE THE IMAGE FILE FROM LOCAL**

To separate the content from the picture and convert into the editable content configuration utilizing editable content catcher to run the program code in the backend. It is utilized to change over the pictures to editable content organization. It perceives the content from the picture utilizing tesseract to actualize a long transient memory. It is utilized for an arrangement of characters separate from the picture utilizing Recurrent Neural Networks.



**Figure 10. IMAGE EXTRACT THE TEXT IN EDITABLE FORMAT**

To read the text from the text file and comparing the individual letters are used to compare with database created. To convert the braille characters with the corresponding Tamil characters in graphical user interface using braille code command.



**Figure 11. TEXT TO BRAILLE CODE**

Information peruses the information document utilizing espeak device to change over into the sound yield utilizing sound direction in graphical UI. Espeak is utilized for discourse synthesizer. It is utilized for content to discourse framework changes over common language Tamil content to discourse. The sound is amazingly normal.

## V. CONCLUSION

Braille codes are the most of the way for the visionless individual to exhibit their appearance and point of view to the globe. This paper underscores with a game plan which helps visionless person who conveys in Tamil to express their reaction and thoughts by uncovering Braille substance to talk correspondence. In graphical UI to get the data picture from the customer and demonstrate the image in window. Expelling the substance from the image and thereafter changed over into the Tamil Braille code and voice. We need the proposed arrangement will a supporting for visionless society.

## REFERENCE

1. V. S. Dharme and S. P. Karmore, "A Electro-Micromechanically Actuated Text To Braille Converted Refreshable Display With The Mono Cell," vol. 4, no. 5, pp. 143–147, 2015.
  2. S. Sultana, A. Rahman, F. H. Chowdhury, and H. U. Zaman, "A novel Braille pad with dual text-to-Braille and Braille-to-text capabilities with an integrated LCD display," *2017 Int. Conf. Intell. Comput. Instrum. Control Technol. ICICICT 2017*, vol. 2018-January, pp. 195–200, 2018.
  3. T. Dasgupta and A. Basu, "A speech enabled Indian language text to Braille transliteration system," *2009 Int. Conf. Inf. Commun. Technol. Dev. ICTD 2009 - Proc.*, pp. 201–211, 2009.
  4. M. Tanaka, K. Miyata, and S. Chonan, "Post Processing," vol. 12, no. 4, pp. 430–438, 2007.
  5. A. Moise, G. Bucur, and C. Popescu, "Automatic system for text to braille conversion," *Proc. 9th Int. Conf. Electron. Comput. Artif. Intell. ECAI 2017*, vol. 2017-January, pp. 1–6, 2017.
  6. B. K. Rajan and V. Anjitha, "Braille code conversion to voice in malayalam," *Proc. 2017 IEEE Int. Conf. Commun. Signal Process. ICCSP 2017*, vol. 2018-January, pp. 710–714, 2018.

7. K. K. Kishore, G. Prudhvi, and M. Naveen, "Braille script to voice conversion," *Proc. Int. Conf. Comput. Methodol. Commun. ICCMC 2017*, vol. 2018-January, no. Iccmc, pp. 1080–1082, 2018.
8. A. K. Garg, "Braille-8 – the Unified Braille Unicode System," *Adv. Networks Telecommun. Syst. (ANTS), 2016 IEEE Int. Conf.*, 2016.
9. Z. H. M. Jawaresh, N. S. Ashaari, and D. P. Dahnil, "Braille tutorial model using braille fingers puller," *Proc. 2017 6th Int. Conf. Electr. Eng. Informatics Sustain. Soc. Through Digit. Innov. ICEEI 2017*, vol. 2017-November, pp. 1–5, 2018.
10. National Federation of the Blind Jernigan Institute, "The Braille Literacy Crisis in America," *Natl. Fed. Blind*, 2009.
11. V. A. Devi, "Conversion of speech to Braille: Interaction device for visual and hearing impaired," *2017 4th Int. Conf. Signal Process. Commun. Networking, ICSCN 2017*, 2017.
12. J. L. Dela Cruz, J. A. D. Ebreo, R. A. J. P. Inovejas, A. R. C. Medrano, and A. A. Bandala, "Development of a text to braille interpreter for printed documents through optical image processing," *HNICEM 2017 - 9th Int. Conf. Humanoid, Nanotechnology, Inf. Technol. Commun. Control. Environ. Manag.*, vol. 2018-January, pp. 1–6, 2018.
13. C. Engineering, "International Journal of Electronics and © Ia E M E," vol. 4, no. 1, pp. 18–24, 2013.
14. V. Kartha, D. S. Nair, S. Sreekant, P. Pranoy, and P. Jayaprakash, "DRISHTI-A gesture controlled text to braille converter," *2012 Annu. IEEE India Conf. INDICON 2012*, pp. 335–339, 2012.
15. S. S. Shirsekar, "Education with braille and typography," *Proc. - 1st Int. Conf. Intell. Syst. Inf. Manag. ICISM 2017*, vol. 2017-January, pp. 50–53, 2017.
16. T. Dasgupta, M. Sinha, and A. Basu, "Forward Transliteration of Dzongkha Text to Braille," *Proc. Second Work. Adv. Text Input Methods*, no. December, pp. 97–106, 2012.
17. K. Minamizawa, K. Tojo, H. Kajimoto, N. Kawakami, and S. Tachi, "Haptic Interface for Middle Phalanx Using Dual Motors," *Proc. EuroHaptics 2006 Conf.*, pp. 235–240, 2006.
18. N. Kalra and T. Lauwers, "Iterative design of a Braille writing tutor to combat illiteracy," ..., *Ictd 2007*. ..., 2007.
19. C. A. Pennington and K. F. McCoy, "Providing intelligent language feedback for augmentative communication users," *Assist. Technol. Artif. Intell.*, pp. 59–72, 2006.
20. N. B. Jariwala and B. Patel, "Transliteration of digital Gujarati text into printable Braille," *Proc. - 2015 5th Int. Conf. Commun. Syst. Netw. Technol. CSNT 2015*, pp. 572–577, 2015.
21. Raja, K. Gunasekaran, R.Pitchai, "Prognostic evaluation of multimodal biometric traits recognition based human face, finger print and iris images using ensembled SVM classifier" *Cluster Computing, March 2018*.