

**Universiti Teknologi MARA**

**Braille Image Recognition for Beginners**

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**Thesis submitted in fulfilment of the requirements  
for Bachelor of Computer Science (Hons.)  
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# **SUPERVISOR APPROVAL**

## **BRaille IMAGE RECOGNITION FOR BEGINNERS**

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## **STUDENT DECLARATION**

I certify that this thesis and the project to which it refers is the product of my own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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## ABSTRACT

Braille can be known as a tactile that consist of dots that is used by visually impaired people in reading and to communicate. However, braille text is a complicated tools that is not easily read by normal people. Braille pattern of each alphabets consists of its own pattern in which some of it does not relate to its alphabet. Thus, it is difficult for normal user to detect and recognize the braille pattern. Hence, the objective of this study is to design and develop a prototype that can translate braille image pattern into readable English text using image processing. In order to recognize the braille image, Bag of Features (BOF) is used for the recognition. BOF consists of Speeded-up Robust Features (SURF) and K-means Clustering. SURF technique determines and generates the features point description of each alphabet whereas K-means Clustering is to get the clusters of words in which it selects the most closer to its image. Additionally, image classification is done where it determines the alphabet of braille image using linear SVM classifier. In this study, 78 of braille images are collected from the internet. Out of 78 images, 76 images have been tested to produce result that is similar to the expected outcome. It is found that 97.44% of accuracy is achieved for overall testing data. From the result, it can be concluded that this study has meet the expectation where most of the braille images are recognizable.

**Keyword:** *braille, recognition, Bag of Features (BOF), Speeded-up Robust Features (SURF), K-means clustering*

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