

**Universiti Teknologi MARA**

**Postal Address Handwritten  
Recognition using Convolutional Neural  
Network**

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**Thesis submitted in fulfilment of requirements for  
Bachelor of Computer Science (Hons.)  
Faculty of Computer and Mathematical Sciences**

**July 2020**

## ACKNOWLEDGEMENT

Alhamdulillah praises and thanks to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given. Firstly, my special thanks go to my supervisor, Ts. Prof Madya Dr. Hamidah Binti Jantan, who gave full cooperation and commitment to the completion of this research. Without her opinions, I may not able to carry out this project.

Besides that, I would like to thank my thesis coordinator again for this semester, Ts. Prof Madya Dr. Hamidah Binti Jantan for her concern in giving guidelines, lecture, notes and comments which give me many chances to improve and enhance the quality of my research.

Special appreciation also goes to my beloved parents who are always give moral support even though they not in my side. Without their blessing, I may not be able to archive what I have now.

My appreciation also goes to all computer science lecturers in Universiti Teknologi Mara, Kuala Terengganu, Terengganu for all the knowledge, guidance, and opinions. Lastly, I would like to give my gratitude to my fellow friends, roommates, and classmates. Thank you for all your supports, cooperation, and motivations. May Allah bless all of you.

Thank you.

## ABSTRACT

Today, handwritten recognition becomes a very crucial area in the field of pattern recognition and image processing. Deep learning was commonly used for handwriting recognition. Recognition of handwritten text is analyzed in offline handwriting. The only information that can be analyzed is a character's binary production against a context. While shifting to digital writing stylus gives more detail, such as pen movement, pressure and writing speed, there is still a need for offline methods when it is unavailable online. Postal address, historical documents, archives, or mass digitization of hand-filled forms are especially needed. Extensive work in this area has led to considerable change from conventional methods to human-competitive performance. The conversion of handwritten image into digital format required more time and often affected by errors. Next, noise has been recognized as one of the major issues that decrease the performance of handwritten recognition system. Therefore, this study will develop handwritten recognition system by using Convolutional Neural Network (CNN) as a classifier. CNN was chosen as an algorithm for classification task because various studies had concluded that it is able to produce highly accurate result. The proposed system is able to perform the conversion of handwritten image into digital format that are executable by computer. The CNN model was trained and tested by the dataset that obtain from Kaggle website where it was derived from EMNIST database. Several experiments were done in order to obtain higher accuracy result. In order to evaluate the model, we calculate the accuracy. Accuracy is fraction of labels that the network predicts correctly. After experiment complete, the accuracy achieved from the project is 99.56%. This result will prove that CNN can be the great classifier as it can produce high accuracy rate. Next, the system was successfully developed by implementing the best CNN model as a classifier. The system is able to input an image that contain handwritten text, preprocess the image, recognize the text and finally produce an output which is editable text. Functionality test was done in order to evaluate the system. The result of the functionality test is most of the user are satisfy with the system. The future work may be developed by finding the new way in order the computer recognize the text without segment the image into separated character.

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