

Software Requirements Specification

For

Speech Emotion Recognition

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Prepared by

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1: INTRODUCTION:

Handwriting Character Recognition is a process that translates images of handwritten scanned text into machine-editable text, or pictures of characters into a standard encoding scheme representing them in ASCII or Unicode. A Handwriting Character Recognition system enable us to feed a book or a magazine article directly into an electronic computer file, and edit the file using a word processor. A Handwriting Character Recognition has a variety of commercial and practical applications in reading forms, manuscripts and their archival etc. The project tries to create software for recognition of a handwritten text from handwritten text images. It uses computer vision and machine learning. And it experiments with different approaches to the problem.

1.1 Purpose of the Project

A Handwriting Character Recognition has a variety of commercial and practical applications in reading forms, manuscripts and their archival etc. The project tries to create software for recognition of a handwritten text from photos. It uses computer vision and machine learning. And it experiments with different approaches to the problem.

Such a system facilitates a keyboard less user-computer interaction. Also the text which is either printed or hand-written can be directly transferred to the machine. The challenge of building a Handwriting Character Recognition system that can match the human performance also provides a strong motivation for research in this field.

1.3 Project Scope

For handwritten input, the task becomes even more formidable. Soft computing has been adopted into the process of character recognition for its ability to create input output mapping with good approximation. The alternative for input/output mapping may be the use of a lookup table that is totally rigid with no room for input variations.

The main problem is the handwriting style of every different people has its own approach to handwriting in different languages .This problem motivated us to build a system that will recognize character (English) given as an input image.

1.4 References

1. Shabana Mehfuz,Gauri katiyar, ‘Intelligent Systems for Off-Line Handwritten Character Recognition: A Review” ,International Journal of Emerging Technology and Advanced Engineering Volume 2, Issue 4, April 2012. Access Date: 09/07/2015.
2.]Rahul KALA, Harsh VAZIRANI, Anupam SHUKLA and Ritu TIWARI, “An Overview of Character Recognition Focused on Off-Line Handwriting”, IEEE

2 PROJECT DESCRIPTION

2.1 Reference Algorithm:

We have used the following algorithms:

- CNN
- Classification by help of CTC (connectionist temporal classification)

2.2 .1 Characteristic of Data:

- We are using four handwritten datasets for the recognition of handwritten text. All together it should total in about 188000 images.
- **IAM Handwriting Data [85000 images]** : The IAM Handwriting Database contains forms of handwritten English text and was first published in at the ICDAR (International Conference on Document Analysis and Recognition) 1999.
- **CVL Database:** The CVL Database is a public database for writer retrieval, writer identification and word spotting. The database consists of 7 different handwritten texts.
- **ORAND CAR 2014:** The ORAND-CAR-2014 dataset consists of approximately 10,000 CAR* images extracted from real bank checks with a resolution of 200 dpi. The dataset contains approximately 5000 images for training purposes and 5000 images for testing.
- **Google Drive Data [5000 images]** : The Datasets are collected by various other sources and merges in a single zip file stored at Gdrive.

* **Note:** CAR is an abbreviation for Courtesy Amount Recognition, a technique used in the electronic check clearing process to determine the value of the check.

2.2.2 Data structure

We are using the csv files to access image paths and corresponding labels.

2.3 SWOT Analysis

A SWOT analysis is a valuable tool for understanding the Strengths, Weaknesses, Opportunities and Threats (SWOT) of any business venture.

Strength

This Handwriting Character Recognition is made possible by using machine learning algorithms to learn how the handwriting recognized in by dividing the image into lines then into words and further into characters and then each character is predicted and returned combining to give the actual word.

Weakness

The weakness of the model is that using the Word classification the model is not giving the correct predicted output up to the mark and thus we will further need the data to be precise and thus have to train model on characters datasets.

Opportunities

The Handwriting Character Recognition helps in the recognition of the handwriting and can be used in recognizing the handwritten text from the images.

Threats

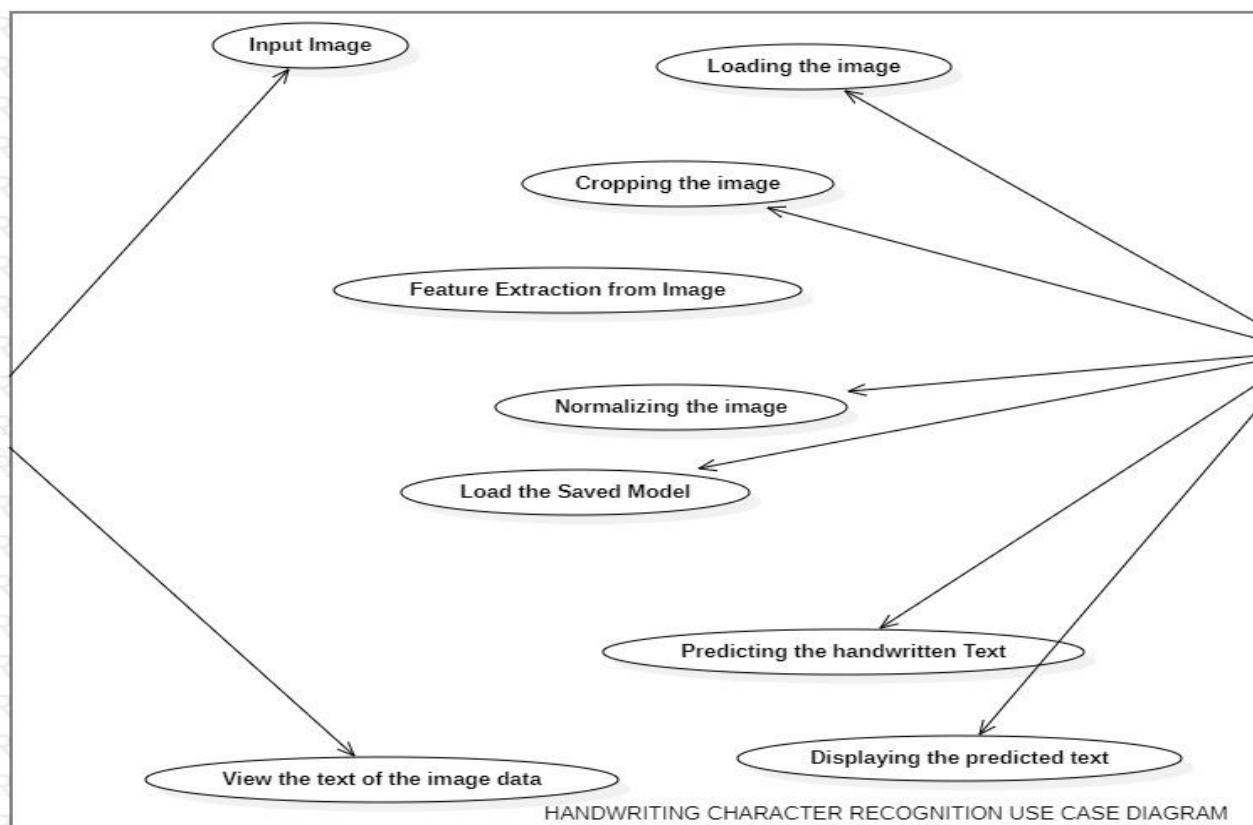
There are some problem in the model we have created as it is being trained on the words dataset hence it is not giving the upto the mark accuracy hence we will create another model which will be trained on the character datasets so it will improve the model accuracy a bit more.

2.4 Project Features

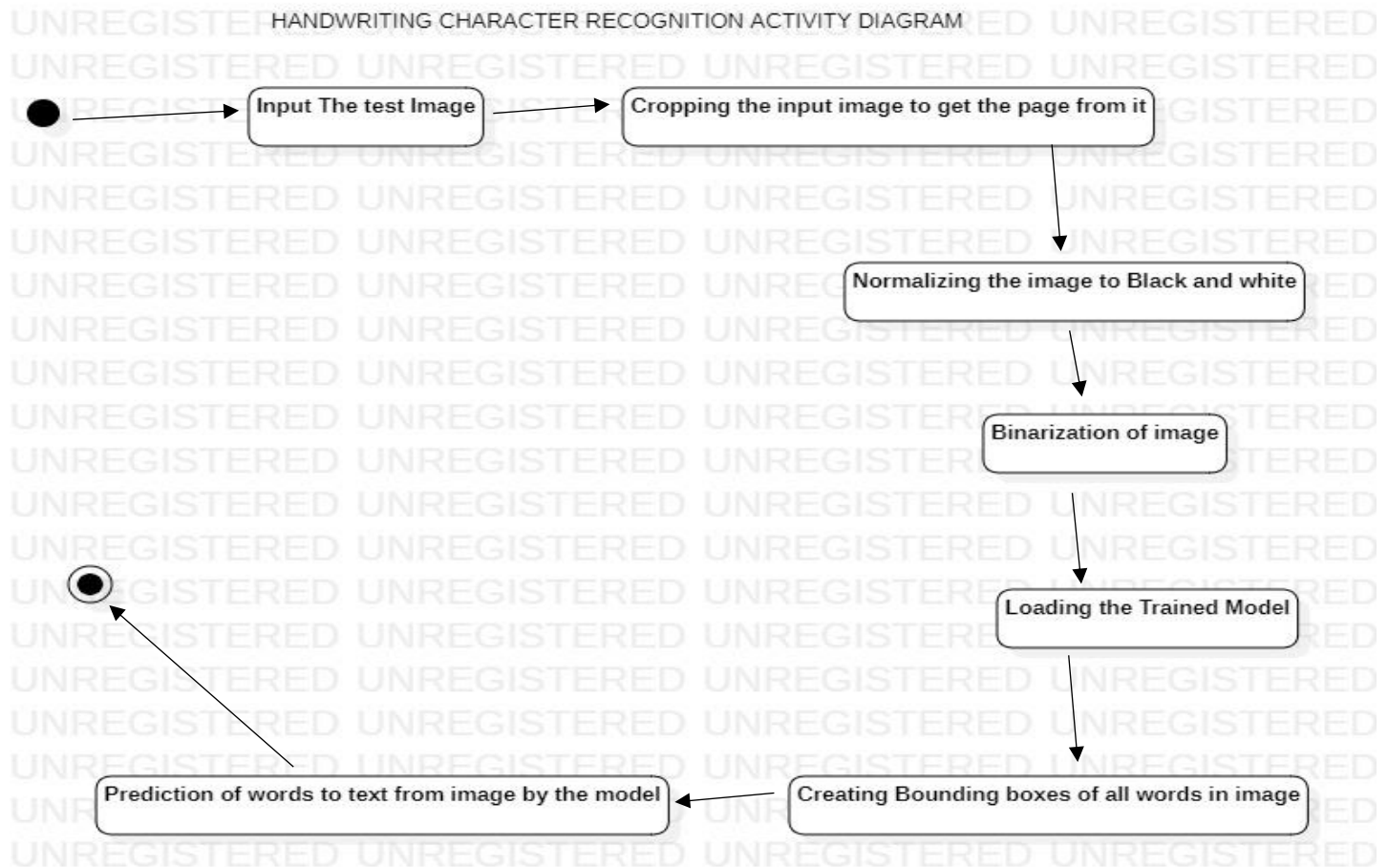
Handwriting Character Recognition System is a machine learning-based application. These methods typically involve training a model on handwritten data and to predict the words being written in image data. There are many different types of machine learning algorithms that can be used for this purpose.

- One common approach is called CRNN(Convolution Recurrent Neural Network).
- We can also use CTC (Connectionist Temporal Classification) model to classify the different handwriting images into text dataset.

2.5 Design diagrams User case diagram:



Activity Diagram:



3. SYSTEM REQUIREMENTS

3.1 SOFTWARE REQUIREMENTS

<u>Name of Component</u>	<u>Specification</u>
Operating System	Windows 10, Macintosh
Front end	Python Programming Language
IDE Required	Visual Studio Code/Anaconda

3.2 HARDWARE REQUIREMENTS

<u>Name of Component</u>	<u>Specification</u>
Processor	Intel(R) Core (TM)i5-3210M CPY @ 2.50GHz 2.50
RAM	16GB
Hard Disk	500GB HDD or 250GB SSD
Mouse	2 or 3 Button mouse
Keyboard	101 y Keyboard