Abstract

This project aims to extract and recognize words from a handwritten document and convert into digital text. We uses two main steps to accomplish this task: Word segmentation and word recognition. Word segmentation is done using scale space technique and other algorithms. These extracted words are then used for text recognition. For text recognition we use Deep learning using TensorFlow. Convolutional Neural Network(CNN) layers are used for feature extraction and Recurrent Neural Networks (RNN) with Long Short-Term Memory (LSTM) for unsegmented handwritten word recognition. Connectionist Temporal Classification(CTC) is used for computing loss and it also act as decoder. Finally we impove whole system by adding more CNN layers for better feature extraction, add support for data augmentation and spellcheckers for obtaining better recognition.

References:

[1] Yaroslav Shkarupa, Matthia Sabatelli, *Offline Handwriting Recognition Using LSTM Recurrent Neural Networks,* https://www.researchgate.net/publication/311672974_Offline_Handwriting_Recognition_Using_LSTM_Recurrent_Neural_Networks, 2016

[2] Harald Scheidl, *Build a Handwritten recognition using tensorflow*, https://towardsdatascience.com/build-a-handwritten-text-recognition-system-using-tensorflow-2326a3487cd5, 2018

[3] Sri. Yugandhar Manchala, Jayaram Kinthali, *Handwritten Text Recognition using Deep Learning*, IJERT, 2020

[4] Batuhan Balci, Dan Saadati, Dan Shiferaw, *Handwritten Text Recognition using Deep Learning*, http://cs231n.stanford.edu/reports/2017/pdfs/810.pdf, 2017

[5] R Manumatha and N Srimal, Scale space technique for handwritten manuscripts, CITESEERX, 1999