School of Engineering and Applied Science (SEAS), Ahmedabad University

B.Tech(ICT) Semester VI : Machine Learning (CSC523)

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Project Title :
Handwritten Text Recognition using Convolutional Neural Networks

Progress Report 1

Activity done in the week:

This weeks focus was on finalizing the problem statement of the project. We considered lots of problem statements and finally selected Hand-written Text Recognition using Convolutional Neural Networks as our problem definition.

Initially, we decided to work on the problem of generalizing the grading of Optical Mark Reading (OMR) sheets by including cases like partially-filled bubbles, crossed-out bubbles, ticked bubbles. These cases are usually not considered and students lose marks in such cases. We had read a few papers on this topic and were thinking of using Generative Adversarial Networks (GANs) for the same. Our work was an extension of the work titled: CheckIt - A Low Cost Mobile OMR System . On contacting the authors of the paper for their suggestions on how to enhance the system, we were told that they had already handled all the anomalous test cases and were working on writing a paper publishing their work.

We then decided to switch to the problem of Handwritten Text Recognition, which is a very challenging task owing to the large amount of variability in language, fonts, textures, lighting conditions, background and style of handwritings. Though significant work has been done in this field, most of the work was centered around the use of conventional Machine Learning approach, involving careful selection of features. This drastically reduces the dataset for which the algorithms could effectively be used, resulting in more restrictions on the user for the type of handwritten texts that could be given to the model for text recognition. We plan on creating a more generalized algorithm using convolutional neural network and Long Short-Term Memory (LSTMs) for detection of handwritten text in the data and recognition of the text.

In this regard, we read the following articles:

[1] B. Moysset, C. Kermorvant, and C. Wolf, Full-Page Text Recognition: Learning Where to Start and When to Stop, 2017.

[2] B. Wang, J. Xu, and J. Li, Scene Text Recognition Algorithm Based on Faster RCNN.

[3] T. Wang, D. J. Wu, a Coates, and a Y. Ng, End-to-end text recognition with convolutional neural networks, 21st Int. Conf. Pattern Recognition,2012, no. Icpr, pp. 33043308, 2012.