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Text Detection and Recognition of Medical Reports

Akshada Shitole[1], Malika Pagare[2], Hemlata Ahire[3]

[1]*Department of Computer Engineering, K K Wagh Institute of Engineering Education & Research, Nashik, Maharashtra, India*
[2]*Department of Computer Engineering, K K Wagh Institute of Engineering Education & Research, Nashik, Maharashtra, India*
[3]*Department of Computer Engineering, K K Wagh Institute of Engineering Education & Research, Nashik, Maharashtra, India*

Abstract - *The Modern Medicines must maintain the proper E-Health Records. These E-health records are used to preserve the complete health information of the patients. These health records are very important in the analysis of the patient's further treatments and the decision making. But sometimes complete health record information is not available during treatments just because of some operational faults or problems. So, to overcome this problem, deep learning algorithms for text detection and recognition of clinical health reports is applied. For Text Detection the patch strategy & for detected text recognition the neural networks are used. This text detection and recognition approach will be helpful to various physicians or doctors to concatenate the verifiable health records and drawing in patients in their own health care insurance.*

Key Words: **Detection, Extraction, Recognition**

1. INTRODUCTION

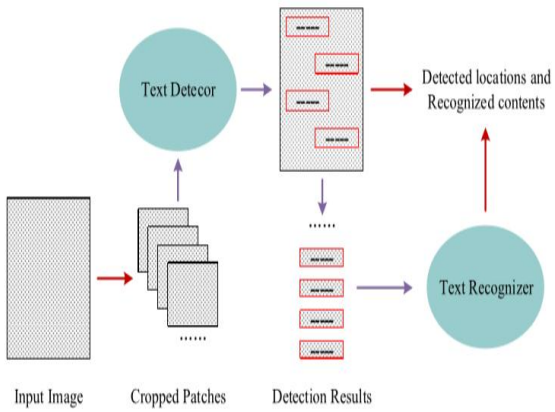
One of the important clinical report of patients is medical laboratory report data. This data is very useful for physicians or doctors for proper diagnosis, analysis, assessments of long-term monitoring. Processing of this digital information may be different in many countries but its need is normal for medical reports and data records in hospitals. On the basis of this background, our purpose is making the medical reports in the digitalized form. The Challenge is to apply a detection and recognition of text on images of medical reports. But the image that taken as an input can be of high resolutions or it can be of the different sizes. So, to overcome this problem the image must be resized to small scale i.e. the large-scale image can be converted into the small-scale image [2,3]. In some images the text can be blurry or it can be difficult to detect therefore the patches are used. The patches will use to detect the text with high resolution or for the text which is difficult to detect. The medical laboratory reports may contain some symbols, numbers or the multi lingual Chinese or Latin texts. For detection of these texts the features from shallow as well as deep layers in the neural networks were used. By using the features of both layers of neural networks we can simply tackle the problem of complex character text detections. The process is divided into two phases. The phases are text detection and text recognition. Initially, apply text detection patch-based strategy and then the text recognition is done with the help of CRNN (Convolutional Recurrent Neural Network) [1].

1.1 Text Detection

The work of text detection is roused by the scene object detection methods as well as the semantic segmentation [4,5]. Here, by using the patch strategy the text is detected. Then the text is trimmed or crop from the input picture and it can be given as a input to the text recognizer [1]. The text detection is carried out based on the patches. To start with this the source picture is crop into little patches or fixes by sliding window. The most extreme texts are selected from the area of sliding window. The patches are randomly selected and combined together in the batches, and then it is sent to detection networks. All the patch predictions will be adjusted to the original picture and Non-Maximum Suppression (NMS) technique is applied. The NMS is used to post process detection candidates to get the output results [1].

1.2 Text Recognition

For recognition the two adjacent features of convolutional layers are combined together. The CRNN is the memory map for recognition. The convolutions are connected to RLU (rectified linear unit). For the text recognition the Adams optimizer is used to train the entire network. The main aim of the recognition is to concatenating the two adjoining layers features contributing an input of the following next layer. The text recognizer takes the output of text detector i.e. the set of bounding boxes containing texts [6]. The text recognizer will take the areas of bounding boxes in source picture and then outputs the results as a recognized text.



2. LITERATURE SURVEY

Wenyuan Xue [1], proposed a methodology for detection and recognition of texts from medical reports using patch strategy and the deep learning. The proposed approach is estimate for both detection of text as well as recognition of text. The tests are done on the dataset called as "Chinese Medical Document Dataset (CMDD)".

Baoguang Shi [2], investigated the issue of recognition of scene text, it is a difficult task in image sequence recognition. Neural network, which joins the sequence modeling, features extraction, detection, and arranging into a unified structure.

Gao Huang [3], observes and presents the Dense Convolutional Network (DenseNet), that interfaces each layer to every other next layer in a feed 4forward design. These traditional convolutional networks with LN layers have the LN connections each layer and its subsequent layers over the network.

Tsung-Yi [4], finds the extraordinary closer view foundation class awkwardness experienced during planning of the thick indicators is the main driver. They have proposed to address this class abnormality by reshaping the standard cross entropy setback such a that it down-loads the incident distributed to the well-classified models.

Evan Shelhamer [5], defines space of the completely convolutional systems it likewise clarifies their applications in spatially dense expectation tasks, and furthermore attracted the associations with earlier models. They have adapted AlexNet convolutional neural network and the VGG net i.e. Visual Geometry Group with the convolutional networks and then they passed the learned representations by fine-tuning to the segmentation tasks.

Zheng Zhang [6], proposed a methodology for text detection in natural pictures. In this approach Both local as well as the global cues are taken into an account for the localizing texts in a coarse to fine techniques.

Qixiang Ye [7], In This approach Existing techniques are classified into the stepwise or coordinated sub-issues are featured including content restriction or text localization, segmentations or divisions, recognitions, verifications.

Ross Girshick[8], essential and adaptable location calculation or computations that serves to improves the mean normal exactness (mAP) by over 30%. This philosophy joins two elements one can apply high-limit convolutional neural frameworks (CNNs) to the base up region recommendation in order to confine and piece articles and second is when named getting ready data is uncommon, overseen pre-planning for an assistant undertaking, trailed by the space specific fine-tuning, yields a significant execution help.

Anand Mishra[9], concentrates on the problem of recognizing texts extracted from the road pictures. They have introduced a framework that exploits both bottom to up and top to down indications.

3. CONCLUSION

Text Detection from medical laboratory reports will enhance the digitalization. Here, a text detection and recognition is carried out using deep learning. Firstly, the input image detects the text using the patch and then the text is recognized by the text recognizer. While detecting the text from the image, the image resolution may act as a barrier which may affect the results. CRNN framework can be applicable for the other region of activities and problems related to the sequence predictions, recognition of images also. Although it can be improved further in many ways. This will not only help in services of digital health care but also helps in solving data sharing problems among the doctors or physicians.

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BIOGRAPHIES

Ms. Akshada Shitole, Completed Diploma in Computer Technology from Government polytechnic, Nashik 2018, currently pursuing B.E from K K Wagh institute of engineering education and research, Nashik.

Ms. Malika Pagare, Completed Diploma in Computer Engineering at Met's Bhujbal Knowledge City, Nashik in 2018. Currently pursuing B.E in Computer Engineering at K K Wagh institute of engineering education and research, Nashik.

Ms. Hemlata Ahire, Completed Diploma in computer Technology from K K Wagh polytechnic, Nashik 2018, currently pursuing B.E from K K Wagh institute of engineering education and research, Nashik.