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Deep Learning Alpha Numeric and Multi Object Recognization in Captured Motion

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ABSTRACT

Object detection based on deep learning is an important application due to its strong capability of feature learning and feature reprensentation compared with traditional detection methods. An introduction of Classical methods in object detection is explained first and a detailed approach of relation and difference between classical methods and deep learning is also shown. The paper focusses on the frame work design and working principle of models. It analyzes the model performance in real time using concept of Contour analysis which can be worked in normal camera. Text and face recognition are done. Once known face abd unknown faces are detected using recognizer name of the known persons will be displayed and an email (sms) would be sent to the higher authority.

Keywords : Dataset, Contour Analysis, Detection

I. INTRODUCTION

In pattern recognition, the k-nearest neighbors algorithm (k-NN) is a non-parametric method used for classification and regression.[1] In both cases, the input consists of the k closest training examples in the feature space. The output depends on whether k-NN is used for classification or regression:

In k-NN classification, the output is a class membership. An object is classified by a majority vote of its neighbors, with the object being assigned to the class most common among its k nearest neighbors (k is a positive integer, typically small). If k = 1, then the object is simply assigned to the class of that single nearest neighbor

Bayes' theorem is a formula that describes how to update the probabilities of hypotheses when given evidence. It follows simply from the axioms of conditional probability, but can be used to powerfully reason about a wide range of problems involving belief updates.

II. EXISTING DETECTION SYSTEM USING OPENCV CNN (MATLAB)

Deep learning used by the network has been constantly improving, in addition to the changes in the network structure, the more is to do some tune based on the original network or apply some trick to make the network performance to enhance. The more well-known algorithms of object detection are a series of algorithms based on R-CNN, mainly in the following.

2.1) R-CNN

Paper which the R-CNN (Regions with Convolutional Neural Network) is in has been the state-of-art papers in field of object detection in 2014 years. The idea of this paper has changed the general

idea of object detection. Later, algorithms in many literatures on deep learning of object detection basically inherited this idea which is the core algorithm for object detection with deep learning. One of the most noteworthy points of this paper is

2.2) SPP-Net

SPP-Net [11] is an improvement based on the R-CNN with faster speed. SPP-Net proposed a spatial pyramid pooling (SPP) layer that removes restrictions on network fixed size. SPP-Net only needs to run the convolution layer once (the whole image, regardless of size), and then use the SPP layer to extract features, compared to the R-CNN, to avoid repeat convolution operation the candidate area, reducing the number of convolution times. The speed for SPP-Net calculating the convolution on the Pascal VOC 2007 dataset by 30-170 times faster than the R-CNN, and the overall speed is 24-64 times faster than the R-CNN.

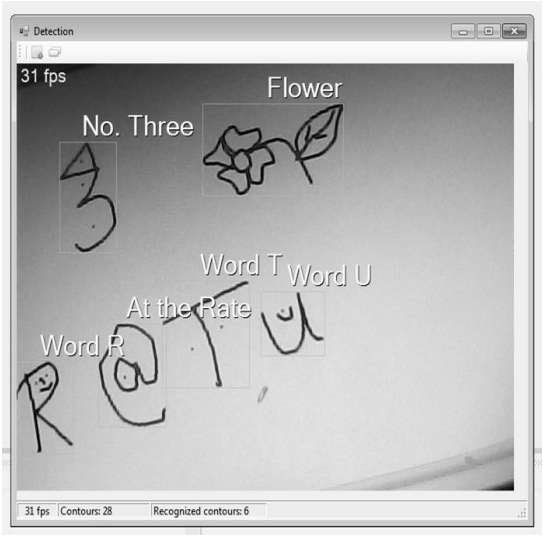
2.3) Fast R-CNN

Higher detection quality (mAP) than R-CNN and SPP-Net; write the loss function of multiple tasks together to achieve single-level training process; in the training can update all the layers; do not need to store features in the disk. Fast R-CNN can improve the speed of training deeper neural networks, such as VGG16. Compared to R-CNN, The speed for Fast R-CNN training stage is 9 times faster and the speed for test is 213 times faster. The speed for Fast R-CNN training stage is 3 times faster than SPP-net and the speed for test is 10 times faster, the accuracy rate also have a certain increase.

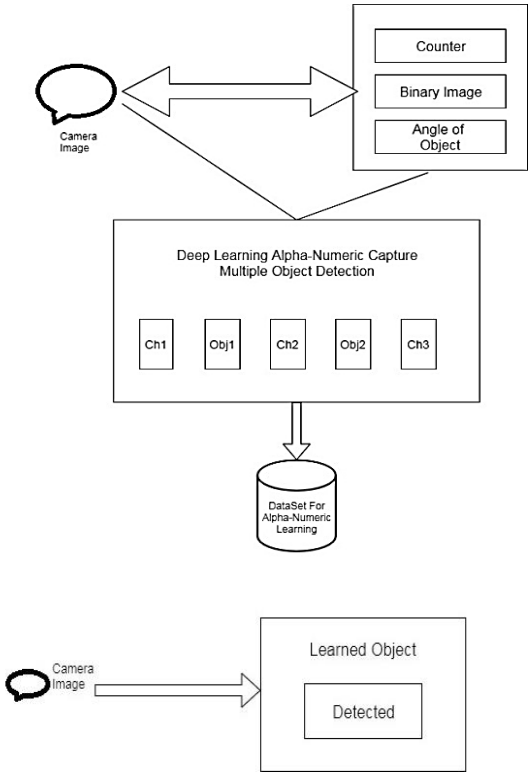
2.4) Faster R-CNN

The emergence of SPP-net and Fast R-CNN has greatly reduced the running time of the object detection network. However, the time they take for the regional proposal method is too long, and the task of getting regional proposal is a bottleneck. Faster R-CNN [13] presents a solution to this that the CNN is applied to the candidate box to extract the feature vector, and the second is to propose a way to effectively train large CNNs. It is supervised pre-training on large dataset such ILSVRC, and then do some fine-tuning training in a specific range on a small dataset such PASCAL.

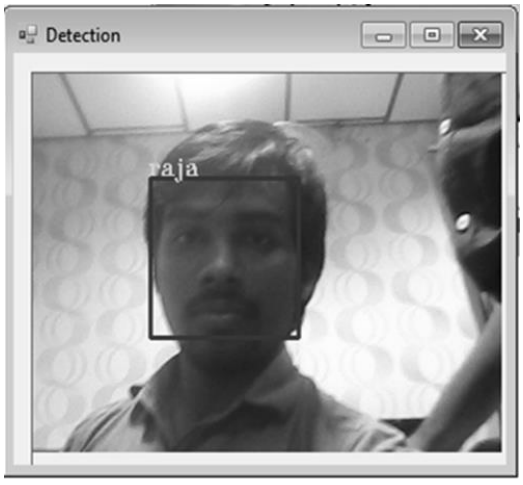
Red marked in the figure is the corner flag, blue marked is soccer goal, green marked is football, and yellow marked is player. In the process of marking the image, in addition to marking each of the four categories of object, but also marked the location of the object which is shown with form of bounding box, and also marked whether objects is clipped or not, whether the object is well recognized, and marked the angle of the player, and marked whether the image is a long view or a close view. These annotated messages are saved in xml format. Take the simplest Figure 2 as an example, and its label of the xml format is shown below.



III. ARCHITECTURE DIAGRAM (CA)



IV. CONTOUR OUTPUT



TRAINED FACES :

V. CONCLUSION

This paper we proposed the method called contour analysis is used it is easily to detect the boundary of the image dataset is used to compare the both dataset image as well as captured image. If the image is not same that image will send to the authorized person.

VI. REFERENCES

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