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Implementation of Support Vector Machine to Analysis Text Detection in Images and Videos

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Abstract:
Support Vector Machine (SVM) is a supervised learning model with associated learning algorithms that analyze and recognize data patterns used for regression and classification analysis. So many techniques have been used for the text extraction only from image or only from video. In this project we are using SVM technique for the analysis and extraction of text from both images and videos. Support Vector Machine has proved itself to be a good prediction technique than the Artificial Neural Network (ANN).SVM has been considered the fast and computationally less complex system than the ANN. This project tries to implement the SVM technique for the decision making part of the text recognition. The feature extracted from the video or image which tells that whether the text is present in the image or not. Text from videos is extracted by converting the video into frames. The main advantage of the present work is text extraction from image and video, effective in high dimensional spaces, can model complex, real-world problems such as text and image classifications. Compared to other techniques it will select the model size automatically. We are selected SVM because it has high dimensional input space, few irrelevant features, text categorization problems are linearly separable.

Key word: *SVM, ANN, classification, decision making, text categorization*

1. Introduction

Methods for scene text localization and recognition aims to find all areas in an image or a video that would be considered as a text by human, mark boundaries of the area (usually by rectangular rounding boxes) and output a sequence of (Unicode) characters associated with its content. They allow for real-world images and video processing (i.e. processing of images/videos taken by a standard camera or mobile phone) and "reading" content of each detected area into a digital text format that can be further processed by a computer.
A variety of approaches to text information extraction from images and videos have been proposed for specific applications including page segmentation, address block location, license plate location and content-based image/video indexing. Text in video images can be further classified into caption text, which is artificially overlaid on the image, or scene text, which exists naturally in the image. Some researchers like to use the term 'graphics text' for scene text, and 'superimposed text' or 'artificial text' for caption text. Existing methods for text detection in images are simple: most of them are based on texture estimation or edge detection followed by an accumulation of these characteristics. One of the most design goal of this project was the ability to extract text from still images as well as video sequences.

2. Methodology

The input given is an image. The rgb image is converted into gray image. The text presented in the images is marked by rectangular boxes and the other background is removed. Target is created for SVM to perform this function. Threshold value will be given to convert the image to gray level image. If the input image given is license plate, plate and non-plate regions are identified separately. The non-plates are removed after identifying it. Then the text will be extracted from the plate.
To extract the text from a video the input given is frames. Before giving the input the video must be converted to frames and then the frames should be taken as input. The procedure from here will be same as done for the image text extraction. The resolution of an image or video should be high. From the low resolution image or video the text cannot be identified in a clear view. The range also

should be fixed. If the range exceeds the text from the plate will be removed. If the range decreases then along with the text some background features also be detected.

Path will be created to find the location of the input image. Text can be extracted from n number of images and video. For each extraction and for plate and non-plate region mean, standard, variation and area will be calculated. Images will be given to a particular function. The histogram will be calculated for the conversion. After the calculation of mean, variation, standard and area the edge color, position of the text, bounding box are calculated.

3. Result and Discussion

Figure 1 and 2 shows the output of our project. Fig 1., shows that the text extracted from the image and the figure 2 shows the extraction of the text from a video.

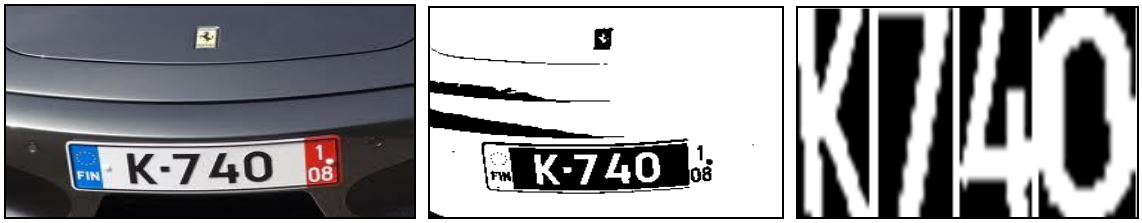

Figure 1: (a) Input rgb image (b) Gray image (c) Output

Figure 2(a): Frames converted from video

Figure 2(b): Output text extracted from video

4. Conclusion

There are so many techniques which are used for extracting the text from images and videos individually. In the present method we are using SVM for the extraction of text from both images and videos. From videos the text is extracted by converting it to frames.

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