

WE CLAIM:

1. A system for automated vehicles license plates characters segmentation and recognition comprising
an imaging processor connected to atleast one image grabber module or camera;
5 said image grabber module captures images of the vehicles and forwards it to said connected imaging processor; and
said imaging processor segments and recognizes the vehicles license plates character region including the region with deformed license plates characters in the captured vehicle images by involving binarization of maximally stable
10 external regions corresponding to probable license plate region in the captured vehicle images.
2. The system as claimed in claim 1, wherein the imaging processor includes
LP localizer cooperating with the image grabber module or camera to receive
15 captured images of the vehicles and localizes probable license plate region in the received images of the vehicles;
generic character segmenter connected to said LP localizer to receive the probable license plate region and separate most of non-license plate noisy regions from therefrom for segregating actual license plate regions and
20 subsequently discarding the non-license plate noisy regions; and
character segmenter connected to said generic character segmenter to receive the actual license plate regions and segmenting license plates characters including deformed license plates characters therefrom free of noisy components by involving distinguishing pixel statistics belonging to foreground and
25 background of the actual license plate regions thus identified through maximally stable external regions.
3. The system as claimed in claim 2, wherein the LP localizer localizes probable license plate region in the received images of the vehicles by deploying any

standard License plate localization techniques based on Image processing, machine learning or Deep learning technology.

4. The system as claimed in claim 2, wherein the generic character segmenter
5 separates non-license plate noisy regions from the probable license plate region and segregates the actual license plate regions by applying different filtering criteria like number of connected components, dimensions of the connected components etc. at different steps of the presented invention.

10 5. The system as claimed in claim 4, wherein the character segmenter is configured to operate on gray-scale of the actual license plate regions subjected to image enhancement schemes whereby said character segmenter involves maximally stable external regions to first crudely segment characters in the actual license plate regions covering all the characters which corresponds the
15 foreground objects of the license plate regions along with noisy components while remaining of the license plate regions as the background object.

6. The system as claimed in claim 4, wherein the character segmenter segments the license plates characters including deformed license plates characters
20 therefrom free of noisy components by involving

calculating pixel values belonging to the foreground and the background of the actual license plate regions and selectively converting the actual license plate regions into grey scale based on median of the pixel values for having darkish foreground and whitish background;

25 applying local-binarization on the gray-scale image for removing of noise component from the binarized output;

applying morphological closing operation on remaining components to get a closed image and thereby removing row-column based extra regions from the closed image to obtain mask image for discarding of noisy components therein based on the pixel values;

- 5 involving tight bound rectangle rotation to correct skew in the image and obtain a gray-scale skew corrected image and discarding the noisy components therein based on the pixel values;

applying a line fitting algorithm to remove noisy components based on bounding box information of remaining characters and applying another noise removal
10 scheme to get the final output binary image containing all the characters properly segmented.

7. The system as claimed in claim 6, wherein the character segmenter selectively converts the actual license plate regions into grey scale based on median of the
15 pixel values for having darkish foreground and whitish background when the median value of the foreground pixels is greater than the median value of the background pixels.

8. The system as claimed in claim 6, wherein the character segmenter which
20 applies the line fitting algorithm to remove noisy components based on bounding box information of remaining characters involves minimum bounding rectangles as final ROIs to prevent discarding of the deformed characters attached to noises whereby remaining binary components which are outside the minimum bounding rectangles are discarded as noise.

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9. A method for automated vehicles license plates characters segmentation and recognition involving the system as claimed in claim 2 comprising
involving the LP localizer cooperating with camera to receive images of the
30 vehicles captured by said camera;

localizing probable license plate region in the received images of the vehicles by the LP localizer;

involving the generic character segmenter to receive the probable license plate region for separating most of the non-license plate noisy regions from the
5 probable license plate region

segregating actual license plate regions and subsequently discarding the non-license plate noisy regions by the generic character segmenter; and

involving the character segmenter to receive the actual license plate regions and segmenting license plates characters including deformed license plates characters
10 therefrom free of noisy components by involving distinguishing pixel statistics belonging to foreground and background of the actual license plate regions thus identified through maximally stable external regions.

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