

Traffic Sign Recognition  
Functional Requirements List and Performance Specifications

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## **Introduction**

The objective of the Traffic Sign Recognition project is to identify a traffic sign from a digital photograph. The sign may be viewed from various angles and in many diverse background situations. The identified sign will then be highlighted after identification. All image processing will be done in MATLAB. The design team hopes to create a system that can be expanded, in the future, to become part of a real-time autonomous vehicle control system.

## **Overall System Block Diagram**

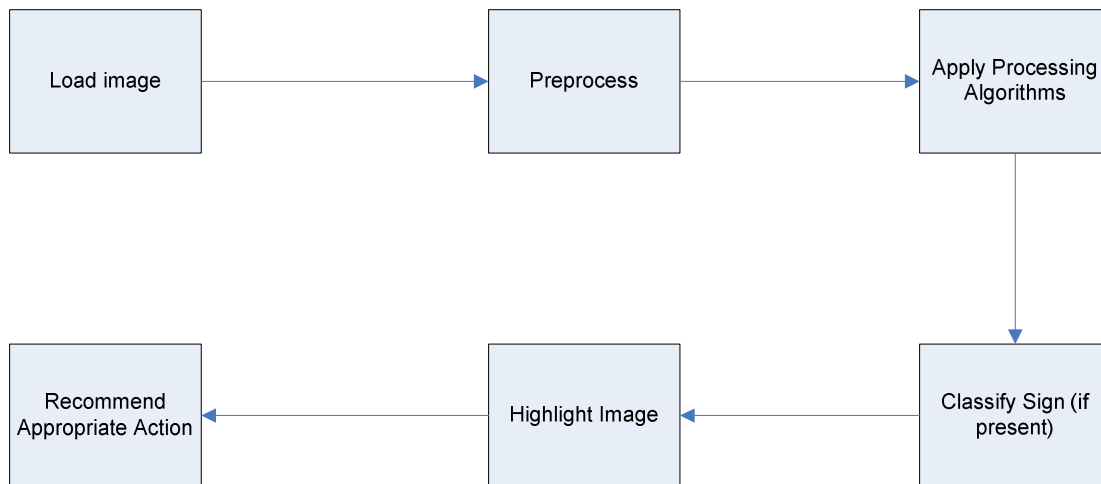


Figure 1 – Overall system block diagram

Input to the system will be an image loaded from the computer's hard drive. Preprocessing including contrast, brightness, clarity will then be performed. The actual image processing including color detection and edge detection will be applied next, and the software will then attempt to determine if a sign is present. If present, the sign will be classified and highlighted. To allow for future expansion, action will be recommended to a hypothetical vehicle based on the nature of the sign observed. Figure 1 shows an overall system block diagram for the project.

## **Functional Requirements**

Preprocessing will check contrast, brightness, and clarity. This block will make sure the image is ready to have image processing done to it. After passing through this preprocessing block, the image shall be ready to have processing algorithms applied to it.

The application of processing algorithms shall take the preprocessed image and find colors of interest and look for shapes relating to the sign or signs we are searching for. This block shall find regions of interest on the image and these will be further processed to obtain the type of sign. This is done in the following block.

The classify sign block shall take the regions of interest passed from the algorithms block. These regions will be analyzed and used to compare to 'templates' of known

signs. This allows for the system to identify exactly what sign is contained in the image that was processed.

The highlight image subsystem shall create some sort of distinguishing box or highlight around the actual sign.

The recommend appropriate action subsystem shall give a recommended action as an output based on the type of sign encountered.