Universidad Carlos III de Madrid

## OO/UC3M/62- TRAFFIC SIGN RECOGNITION SYSTEM

The research group CAOS at the Computing Department of the Carlos III University of Madrid, Spain, offers an efficient recognition system for traffic signs using a set of classifiers. This system can be used as part of an active security system in cars. The fact that the system is based on a set of classifiers facilitates a distributed implementation, resulting in cheaper hardware and an improvement in fault-tolerance.

### Description and special features

The growing number of cars and the high rate of car accidents all over the world motivate the search of new methods to prevent such accidents. In recent years, work has been done in incorporating intelligent systems in vehicles to assist drivers in order to prevent and avoid accidents. An example of such a system is the Advanced Driver Assistance System (ADAS), which warns the driver of dangerous situations. Some of these systems are specialized to urban environments where the presence of pedestrians and traffic sign recognition presents additional challenges. In particular, traffic sign recognition can be difficult due to (partly) hidden or damaged signs. Traffic sign recognition is recently attracting interest due to its application to the ADAS, since traffic signs may automatically limit a car speed or indicate that the limit has been exceeded.

Within the machine learning community there is an agreement on the need of combining several classifiers, what it is called the set of classifiers, to take decisions. The contribution of each classifier and even the decision as to which classifier is best in each case can be considered as well. The key idea is that sets of classifiers are more precise than each of the classifiers separately.

Taking into consideration the application setting and the research area mentioned above, our system is focused on traffic sign recognition once the signs have been detected. The system is basically composed of two modules: the image pre-processing module and the image recognition module. The pre-processing module includes tools for selecting the characteristics that reduce the amount of information needed to identify a traffic sign. Thanks to this reduction, the recognition module works only with the information it needs, resulting in a more efficient system. On the other hand, the recognition module is composed of a set of specialized classifiers that can classify each traffic sign in a distributed manner. This distribution is mapped directly to hardware, allowing the use of mid-range hardware.

### Innovative aspects

The automatic selection of traffic sign characteristics and sign classification by means of specialized sets of classifiers makes the proposed system different to current systems.

### Competitive advantages

Companies that develop Advanced Driver Assistance System, that are able of recognizing traffic signs increasing safety and ease of driving, will increase the worth of its final product if it is efficient in any environment what Driving takes place.

### Technology Keywords

Artificial Intelligence; Image, image processing, model recognition

**Contact Person:** María Dolores García-Plaza
**Phone:** + 34 916249016
**E-mail:** comercializacion@pcf.uc3m.es