# Visual complexity in traffic as indicated by image analysis

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**Abstract**

The purpose of this paper is to analyse the road context as it is perceived visually by the driver and how this influences the journey. A vehicle was specially equipped with a set of TV cameras for the aim of this study. The cameras were arranged in such a way as to record driving activity and the road context during a drive along a road situated in Messina (Italy), where many accidents occur. The filmed recordings, the subsequent extraction of images and their classification in accordance with the driver's posture and, lastly, the processing using Image Analysis techniques, enable a driver's visual load to be quantified. This rating parameter is called the Visual Load Index (VLI).

**Aim of the Research**

This research project aims to analyse certain behaviours adopted by the driver on a journey and to obtain a single score that measures a visual load (Visual Load Index) in relation to the following variables: traffic, any emergency manoeuvres, handling of speed according to morphological complexity, the light and weather conditions, the presence of any road signs or any slip roads or junctions (Bosurgi et al., 2003).

Image processing techniques were adopted to achieve the desired goals (Gonzales & Wood, 2001). The aim is to extract from the images certain relevant parameters that can be measured consistently and to eliminate details considered to be of little relevance, thereby focussing attention only on the elements of interest (Iannizzotto, 2001).

Given that the variables we wish to monitor originate from eye movements, in relation to the complexity of the road context (Bosurgi et al., 1999; Bosurgi et al., 2000), the information needed was acquired using a set of TV cameras installed in a vehicle and interfaced with a acquisition and processing system. In this case, the objective was to perform trials on a road normally open to traffic, without the driver being distracted by devices that are highly invasive, and consequently even potentially dangerous.