



Benefit of infrared images in visibility appreciation for fog conditions

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Fog situations induce an increase in both accident probability and severity. They constitute a significant part in accident rate. There is very few means to forecast fog, nor to appreciate its density, and its associated visibility decrease. An approach consists in developing on-board tools to qualify and to quantify the fog, and to improve the visibility within each vehicle. Infrared technology is now more common, so solutions based on this specific spectral band could be considered. LW infrared has demonstrated its value in the case of passenger cars. Its use could be discussed too, in particular in the case of obstacles detection. The study presented here deals mainly with the extraction of a visibility distance from LW thermal images in the presence of fog.

A French facility in Clermont-Ferrand allows the generation of fog. It can be generated in day or night conditions. The facility is 30 m long, for a 220 m³ volume. The fog is generated spraying water micro droplets, which size is controlled and measured. Experimental conditions could be adapted through water pressure, water nature as an example. Visibility is appreciated with a device measuring light transmission.

In the case of infrared, visibility is obtained through the definition of contrast of an object on a given background. On such a basis, infrared spectral band provides a factor 2 benefit on a conventional road sign, and of a factor 4 in the case of a heated one, with meteorological visibility of 20 m. Some theoretical aspects will be described, along with a description of the whole experimental setup.