Study of driver's behavior during overtaking situations

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Abstract

Driving is often a highly complex task mainly because of the growing traffic density. Car manufacturers and equipment suppliers propose more and more driving assistance systems in order to keep safety at the higher possible level. Some of these assistance systems deal with longitudinal aspects of the driving task (ABS, ACC …) but few with lateral aspects.
However, systems dedicated to the prevention of hazardous lane changes should significantly improve road safety. Our work focuses on this issue and aims, in a first step, at a better knowledge of driving behaviors during overtaking situations.

Keywords – driver behavior, driving simulation, lane change situation, Principal Component Analysis, time windowing

1. Introduction

Nowadays, driving is often a highly complex task, mainly because of the growing traffic density. Car manufacturers and equipment suppliers propose more and more driving assistance systems in order to keep the safety at the higher possible level in spite of this increasing traffic density. Dealing with longitudinal aspects of the driving task, some systems are now common such as ABS (Anti Blockier System), BAS (Braking Assistance System), or ACC (Adaptative Cruise Control [1]).

Systems dealing with lateral aspects of the driving task are rarer. LDW (Lane Departure Warning) aims at warning the driver when his vehicle "involuntarily" moves out of its current lane (more exactly, unless a turn indicator is on in the right direction). Some manufacturers also propose the BLIS (Blind Spot Information System) in order to protect against some collisions when switching lanes.

These two systems are a great help to the driver, but they cope only with a part of hazardous lane changes and a more general assistance system should significantly improve road safety. Our work focuses on this issue and aims, in a first step, at a better knowledge of driving behaviors during overtaking situations.