

Haptic feedback implementation in assistance and warning car systems

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Abstract

New era has just started in the car infotainment with the use of larger touchscreen including several integrated functionalities, even becoming an extension of user smartphones. Besides, due to new minimalistic dashboard, designs are leading to disappear nearly all the physical buttons, commonly used to control audio systems or to set the interior temperature of the vehicle. Moreover, warnings are displayed in the digital dashboard. Unfortunately, drivers who are not familiar with these configurations require them rather more visual attention raising safety concerns and on the other side; make the warnings less efficient. However, automotive industry is deploying in parallel, a technology called haptic feedback to include the latest technologies without compromising the security. This technology allows to deliver tactile feedback to the elements which surrounds the driving position, such as the seat belt, the screens or the steering wheel. Therefore, this study focus on how the haptic technologies are implemented in cars. First and foremost, two categories have been developed in order to understand how and where these technologies can be applied. Regarding the first category refers to haptic assistance that usually takes place in the seat and the dashboard displays. Mainly it is aimed to help the user when he or she needs to interact with the infotainment or to control any function of the vehicle as well as achieving a more immersive and intuitive experience. On the other hand, the second category is haptic warning which allows to prevent frontal crashes, to alert in case of speeding, lane departure prevention or awareness of surroundings. It is known that the key point is to be as fast as possible to convey information to the driver. Furthermore It has been proved that they react faster when tactile feedback is received rather than a visual or auditory stimulus. Finally, this project provides perspectives of haptic technologies in short term.