

Haptics in automotive applications and active safety

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Haptics is a rapidly expanding research area with applications from robotics to human behavior, and is now mature enough to be incorporated in devices to reduce visual and cognitive distractions for the driver. A touchscreen with spatial touch feedback, i.e. feelscreen, allows the driver to allocate less attention to the device, and thus keeping the driver focusing on the task of driving. Another direct application of haptics and active safety concerns material properties and finding the right material that provide the right feel without compromising for example material benefits in reducing reflection. The second key aspect of haptics in active safety is the driver's interaction with the materials of the interior of the vehicle. For example, do the controls have the right feel and grip, is the placement of the component optimal for performance, and last but not least, do the materials support the desired haptic effect. The amount of plastics and reinforced plastics in cars and trucks is steadily increasing as these materials enable production of lightweight, innovative and cost-efficient components. Robust manufacturing of plastic parts with attractive aesthetic and haptic properties is, however, not an easy task as the color, gloss, surface texture, etc., are affected by a number of different parameters such as part design, rheology of the plastic material, mould design, packing and holding pressure, cooling etc. A detailed understanding of how different parameters affect the aesthetic and haptic properties of plastic parts is therefore of great importance, to enable robust manufacturing. This is the topic of an ongoing FFI-project project together with the plastic industry and automotive industry in Sweden. The results and knowledge generated within the project will be of great value for the whole value chain from plastic producers to automotive manufacturers.

Keywords: haptics, perception, psychophysics, driver behavior, plastic components, haptic interfaces.