VISION IN VEHICLES – IV
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BREAKING UP OPEN-LOOP STEERING CONTROL ACTIONS THE STEERING WHEEL AS AN ACTIVE CONTROL DEVICE

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Abstract

Active control devices have been used mainly in the field of aviation to reduce operator workload. At the handling level of car driving, the steering wheel can be used as an active control device to transmit relevant proprioceptive-tactual information cues for lateral control. To examine the use of proprioceptive-tactual information signals, an experiment was conducted in a fixed-base driving simulator. The driver had to initiate a lane change manoeuver, which can be described by an open-loop control behavior and during the manoeuver a warning signal could occur to inform the driver to stay in the right lane. This would break up open-loop control and transfer it to closed-loop control. Different proprioceptive-tactual signal cues via the active steering wheel (e.g. short vibrating torque shift, short steady torque shift) were compared with an auditory signal cue as the control condition. The results show, that proprioceptive-tactual feedback can be used to break up open-loop mode driving behaviour and that the steering wheel as an active control device supports the driver in his/her driving task.

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