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Titel des Beitrags: Method to analyze the body movement for the mirror view and test method to verify the simulated results

Abstract: RAMSIS cognitive is a powerful tool to analyze sight requirements for the driver in the cab of a vehicle. Although RAMSIS offers an extensive amount of features, it does not at this point allow the simulation of driver’s mirror glancing behavior. Drivers move their body to increase their field of view and to see objects in the periphery. Especially in trucks, this behavior can be observed in situations where the trailer covers most of the field of view. For creating new systems for indirect vision like camera-monitor-systems, it's necessary to know the dynamic ranges of the mirrors field of view. A method is developed in order to incorporate mirror glancing behavior in to the RAMSIS model. A road scenario containing a RAMSIS-manikin sitting in the truck cabin with mirrors and an object to observe is built with CATIA. The object is placed out of the normal field of view at a driver’s point of interest (e.g. the end of a trailer by turning around). From this object a geometrical model showing the area where the object is visible in the mirror. Essentially, a cone is constructed from the object to the mirror and then reflected away from the mirror again. Besides the normal truck restrictions to calculate the position and posture of the manikin (feet to the pedals, H-Point to the seating field, etc.), a new restriction placing the eyepoint into this cone (from the mirror to the cabin) is made. Combined body and eye movements are simulated this way in the RAMSIS environment. To prove the results of the model an experiment is made in a real truck setting, where body and eye movements are measured. In this research, six Vicon cameras were mounted inside the truck cabin to capture the body movement of the driver.
Markers were placed on to specific points of the participants. The eye movements were captured by the head mounted Dikablis-System. Vicon and Dikablis were synchronized so that the correlation between the two parameters (eye and body movement) can be made. A comparison between the modeled posture and the real behavior can be done afterwards. Drafting a generic experiment combining the body movement of a person and their eye movements can make the simulated behavior in human models more realistic. By knowing the real correlation between eye and body movements and to implement them in a digital human model, the understanding of drivers’ behavior is facilitated in the preliminary phase of creating a new cabin design.

Herausgeber:
Reed, Matt

Kongress-/Buchtitel:
International Ergonomics Association Technical Committee on Human Simulation and Virtual Environments

Jahr:
2013

Occurences:
Einrichtungen > Fakultäten > Fakultät für Maschinenwesen > Institut für Produktionstechnik > Lehrstuhl für Ergonomie (Prof. Bengler) > 2013_Gesamt

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