

Supporting elderly cyclist with rear-view assistance

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ABSTRACT

The number of seriously injured older cyclists in traffic is increasing. About 85% of these seriously injured cyclists are victim of a single-sided accident, an accident in which no other party is involved [1]. Research has shown that older cyclists have trouble looking over their shoulder, a cycling activity which has been related to falling [2]. Elderly cyclists (>65 years old) would appreciate assistance for detecting traffic from behind [3]. A corresponding potential technological solution might be a rear-view assistant. Technology acceptance and successful implementation requires, among others, a design that is adjusted to the cyclist and provides optimum desired support with minimal cognitive workload. The aim of this study was evaluating rear-view assistance for older cyclists by applying various forms of feed-forward technology to warn for upcoming traffic from behind.

To gain understanding of the effects of feed-forward (FF) on cyclists, mental workload of ten elderly participants (>65 years) and acceptance of the system were registered under different FF conditions (FF-light, FF-vibration and no-FF warning). Mental workload was measured by means of a secondary task (PDT) and subjective measures. The study was carried out in a laboratory setting on a cycling simulator. The participants were asked to cycle on a normal bicycle, which was positioned on an indoor bicycle trainer. Projections on a large screen in front and in the rear displayed the cycling environment.

Our participants experienced the FF support of the rear-view assistance while cycling as very useful and pleasant (score 34 to 45 of 45). Particularly, the FF by vibration warning was experienced as less strenuous compared to no FF warning or FF by light. The FF vibration warning did not influence the mental workload.

In conclusion, FF warning of upcoming traffic from behind can support the older cyclist successfully without increasing their workload unnecessary.

Keywords: elderly cyclists, feed-forward, mental workload, laboratory.

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