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Efficiency and Distraction Evaluations of Motorcycles Mounted Infotainment Systems and Controls

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Abstract: Due to the advancement of technology and the increase of leisure activities during driving, various types of infotainment systems and controls attached on vehicles, especially motorcycles, are being introduced. However, we do not know much about the efficiency of these infotainment systems and controls, let alone how much they might distract the drivers. The purpose of this study was to evaluate the efficiency of motorcycles' infotainment systems with the embedded interface controls. In addition, to simulate the real-road riding environment, this study aimed to examine the extent to which the combination of systems and interface controls tasks distracted users when simultaneously interacting with an additional visual distraction task. Using a moderate fidelity simulator, three types of infotainment systems (i.e. Standard, Advanced, and Premium) that can have different interface control options (i.e. handlebar controls, soft controls [head unit keys], and touch screen controls) were investigated. A visual distraction task was administered during the operation of each infotainment system. By recording users' completion time on the given tasks, the results showed that the time for all system/control combinations was significantly slowed by the visual distraction task. It was also found that the handlebar controls of the Advanced system had the slowest average response time among all the systems, while the soft controls of the Standard system yielded the fastest response time with and without visual distraction. The results indicate that the Standard system and other similar systems with built-in soft controls are more efficient and safer to use in both stationary and mobile situations.

Keywords: Efficiency, Distraction, Infotainment systems, Motorcycles