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Development of a driving VR prototype for distraction awareness employing eye tracking

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Abstract: According to the World Health Organization, car accidents are amongst the top ten worldwide causes of death as a result of speeding, driving while under the influence of alcohol or other psychoactive substances, non-use of safety restraints, and distractions. The current appropriation and impact of mobile devices are changing how people perform daily activities, which is leading to distractions that are increasing the risk of traffic accidents. Attention skills play an important role while driving and have become a field of study that is employing professional driving simulators to create awareness amongst drivers about the dangers of distractions. However, high-end simulators are not available to the general population due to costs and technical requirements, and often used in industry and research. In this paper, we present the development of a virtual simulator that employs consumer grade eye-tracking for measuring attention during driving while receiving incoming calls and texts on a mobile device. The eye tracking metrics provide gaze data that allows determining what caused a distraction during the simulation.

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Contents

I. Introduction

According to the World Health Organization (WHO), driving accidents result in nearly 1.3 million deaths in road crashes each year, costing an estimate of USD \$518 billion globally, ranking as the ninth leading cause of worldwide death [1]. The WHO has identified speeding, driving while the influence of alcohol and other psychoactive substances, non-use of safety restraints, and distractions as the main causes for road accidents. However, accidents caused by mobile device distractions are rising by causing slow reaction times, making it difficult to focus on the elements in the road, and decreasing the awareness required to keep proper distances [1].

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