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Eye Tracking Device as a Tool to Study the Impact of Texting while Driving

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Abstract: Research has shown that there is a correlation between distracted driving and an increase in crash fatality rates. Cell phones have been a major source of a driving distraction, and the study conducted in this paper addresses the effect texting has on driving. Participants in the age group of 18 to 22 years were selected from the student population of Morgan State University. Each participant had at least a couple of years of driving experience. Driving simulator (GTR2©) and eye tracking system from Applied Science Laboratory (ASL©) were used to collect data on driving with texting as distraction and without distraction. Three text messages were sent to the drivers 30m seconds after the start. The experiments were conducted under the normal daytime conditions. Area of interests (AOIs) were created within the visual field of the drivers. Data on eye fixation points and total fixation durations within each of the areas of interest were collected using eye tracking software (ASL Result). The data under distracted and undistracted conditions were analyzed using Pairwise t-test. The results of the analysis showed that there was a significant difference in the number of fixation points and the time spent in each AOI between distracted and undistracted driving. As anticipated more fixation points lied within the area of interest containing the phone compared to any other AOI while driving distracted, and this AOI also accumulated the most total fixation duration. More fixation points and total duration of fixations occurred in the AOI containing major portion of the road while driving undistracted, thus indicating that texting can make the driver lose concentration on the road. The details of the study have been presented in the paper.

Keywords: Eye Tracking, Driving Simulator