Analyzing the Impact of In-Vehicle Infotainment System on Situation Awareness: A study Utilizing SPAM and Eye-Tracking Technology = Menganalisis Dampak In-vehicle Infotainment system terhadap Situation Awareness: Sebuah Studi Menggunakan SPAM dan Teknologi Eye Tracker

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Abstrak

Studi ini menyelidiki dampak In-Vehicle Infotainment System (IVIS) pada Situation Awareness (SA) pengemudi menggunakan Situation Presence Assessment Method (SPAM) dan teknologi eye tracker. Penelitian ini penting karena peningkatan penggunaan IVIS dalam kendaraan modern dapat menyebabkan gangguan yang berpotensi meningkatkan kecelakaan lalu lintas. Simulasi mengemudi waktu nyata melibatkan 20 peserta (10 pria dan 10 wanita) berusia 19-25 tahun, yang menjalani dua kondisi mengemudi: tanpa gangguan dan dengan gangguan IVIS. Data pelacakan mata dikumpulkan menggunakan kacamata Tobii Pro, dan SA dinilai dengan kuesioner SPAM setiap empat menit selama simulasi. Data dianalisis menggunakan SPSS dan Tobii Pro Analyzer dengan berbagai uji statistik, termasuk uji normalitas, Mann-Whitney, Wilcoxon signed-rank, dan ANOVA. Hasil menunjukkan bahwa IVIS secara signifikan menurunkan SA pengemudi selama kondisi mengemudi yang terganggu. Rekomendasi termasuk mengoptimalkan ukuran dan tata letak layar, mengintegrasikan antarmuka multimodal, dan menerapkan regulasi lalu lintas yang lebih ketat untuk meningkatkan keselamatan pengemudi. Studi ini menekankan perlunya perbaikan desain IVIS dan regulasi untuk mengurangi kecelakaan lalu lintas akibat gangguan.
.....This study investigates the impact of In-Vehicle Infotainment Systems (IVIS) on drivers' Situation Awareness (SA) using the Situation Presence Assessment Method (SPAM) and eye-tracking technology. This research is crucial because the increasing use of IVIS in modern vehicles can cause distractions that potentially increase traffic accidents. A real-time driving simulation involved 20 participants (10 men and 10 women) aged 19-25, who underwent two driving conditions: undistracted and distracted with IVIS. Eye-tracking data was collected using Tobii Pro glasses, and SA was assessed with SPAM questionnaires every four minutes during the simulation. The data was analyzed using SPSS and Tobii Pro Analyzer with various statistical tests, including normality tests, Mann-Whitney tests, Wilcoxon signed-rank tests, and ANOVA. The results showed that IVIS significantly decreased drivers' SA during distracted driving conditions. Recommendations include optimizing screen size and layout, integrating multimodal interfaces, and enforcing stricter traffic regulations to improve driver safety. This study emphasizes the need for improved IVIS design and regulation to reduce traffic accidents caused by distractions.