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16. Abstract <p>This experiment compared pedestrian detection using far-infrared (FIR) and near-infrared (NIR) night vision systems, combined with automatic warnings at one of two distances or no warning at all. Sixteen subjects (eight younger than 30 years and eight older than 60 years) pressed a button as soon as they saw a pedestrian on a night vision system in the center console of a vehicle simulator. In addition, they performed a concurrent simulated steering task that required almost continuous viewing of the forward scene, similar to real driving.</p> <p>As in a previous experiment (Tsimhoni, Bärghman, Minoda, and Flannagan, 2004), detection distances with FIR systems were substantially greater than with NIR systems. Detection distances with both systems were shorter than in the previous experiment by about 20 m, probably because of the addition of simulated steering in the present experiment. The automatic visual warning was a blue rectangle that zoomed in on the pedestrian in the video display. In the long-distance condition, it was presented when the pedestrian was 150 m away. Detection distance and accuracy for both night vision systems increased, but the effects were more prominent for the NIR system. Automatic warnings at 75 m improved performance with NIR but worsened performance with FIR, perhaps because in some trials subjects waited for the automatic warning before responding. Subjective ratings of mental workload and of effort were higher for NIR than for FIR, but the addition of automatic warnings did not decrease perceived workload significantly. Overall, automatic visual warnings based on image processing were effective in increasing accuracy and detection distance for pedestrians except when short-distance warnings were used with the FIR system.</p>					
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