CONTEXT INFORMATION CAPTURES ACCEPTABILITY OF ALERTS TO PEDESTRIANS

Jan-Erik Källhammer
Autoliv Development AB
Vårgårda, Sweden
jan-erik.kallhammer@autoliv.com

Kip Smith
Naval Postgraduate School
Monterey, CA, U.S.A.
kip51smith@gmail.com

Summary:

This presentation discusses a research method used to evaluate the design of the alerting logic of an automotive pedestrian warning system. We show how an empirical approach to quantifying the relative level with which drivers are likely to accept pedestrian alerts can be used to define an alerting algorithm. We used the method to investigate a range of contextual factors likely to influence driver acceptance of pedestrian alerts.

The study had two parts: a field operational test (FOT) that gathered a set of 300 video clips of pedestrian alerts with a night-vision system, and a post-hoc or retrospective ratings experiment in which volunteers viewed the clips and rated the relative acceptability of the alerts. We document the consistency of these subjective ratings across groups of raters with different levels of experience with the system. This finding supports the argument that laboratory reviews of FOT data are likely to generalize across the population of drivers.

The derived measure of acceptance was then used to investigate a range of contextual and quantitative factors likely to influence driver acceptance of alerts to pedestrians issued by a night vision active safety system. Four factors of pedestrian location and motion relative to the road explain 85% of the variability in ratings. Time to Impact (TTI) did not improve the regression model. The results suggest that these four contextual factors are likely essential to driver acceptance of pedestrian alerts and largely define the perceptual cues that drivers use to estimate the relative levels of risk posed by pedestrians.

The work demonstrates the utility of subjective driver acceptance criteria as a tool to inform the development of pedestrian alerting criteria. By enhancing our understanding of when and why drivers accept system alerts, we are better able to develop warning strategies that will likely lead to higher levels of driver trust and system acceptance.

Keywords: Intelligent vehicle systems, Pedestrian safety, Acceptance measurement