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Trust in AV: An Uncertainty Reduction Model of AV-Pedestrian Interactions

Abstract: Autonomous vehicles (AVs) have the potential to improve road safety. Trust in AVs, especially among pedestrians, is vital to alleviating public skepticism. Yet, much of the research has focused on trust between the AV and its driver/passengers. To address this shortcoming, we examined the interactions between AVs and pedestrians using uncertainty reduction theory (URT). We empirically verify this model with a user study in an immersive virtual reality environment (IVE). The study manipulated two factors: AV driving behavior (defensive, normal and aggressive) and the type of crosswalk (signalized and unsignalized). Results suggest that the impact of aggressive driving on trust in AVs depends on the type of crosswalk. At signalized crosswalks the AV's driving behavior had little impact on trust, but at unsignalized crosswalks the AV's driving behavior was a major determinant of trust. We also find evidence of too much trust (i.e. overtrusting) in the form of jaywalking and other problematic behaviors. Our findings have the potential to shed new insights on trust between AVs and pedestrians.

Biography: Lionel P. Robert Jr. is an Associate Professor in the School of Information (UMSI) at the University of Michigan. He completed his Ph.D. in Information Systems from Indiana University where he was a BAT fellow and KPMG scholar. He is the director of the Michigan Autonomous Vehicle Research Intergroup Collaboration (MAVRIC), an affiliate of the Michigan Interactive and Social Computing (MISC) Research Group, Michigan Robotics, Information Behavior and Interaction (IBI) Research Group and the National Center for Institutional Diversity (NCID) all at the University of Michigan and an affiliate of the Center for Computer-Mediated Communication (CCMC) at Indiana University. His research has been sponsored by the U.S. Army, Toyota Research Institute, MCity, Lieberthal-Rogel Center for Chinese Studies and the National Science Foundation.



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