Risk Analysis Releases Special Issue on the Social Science of Automated Driving

Herndon, Va. (Feb. 8, 2019) – Risk Analysis, An International Journal has published a special issue, “Social Science of Automated Driving,” which features several articles examining the human side of automated driving, focusing on questions about morality, the role of feeling, trust and risk perceptions.

Autonomous vehicles are more than just an improvement on existing vehicles, they are a brand new technology. The widespread acceptance and adoption of autonomous vehicles hinges less on the technological challenges of creating the vehicles and more on the attitudes and perception of the people the technology is intended to serve. Public uncertainty raises significant societal questions about safety, infrastructure spending, regulations, insurance law and more. This collection of papers underscores the key roles of consumer attitudes and perceptions of risk in understanding acceptance of autonomous vehicles.

The issue begins with an article that explores whether an autonomous vehicle should swerve or stay in its lane when confronted with a situation in which either action could result in a collision with a pedestrian. In two empirical studies, Meder and his colleagues found that most people generally preferred that the autonomous vehicle defaults to staying in its travel lane, especially when the likelihood of collision was unknown. This preference held up even in hindsight when a hypothetical accident had already occurred.

The next article, by Liu, Yang and Xu explores the expected safety levels of automated vehicles. The authors used an expressed-preference approach to measure the acceptable level of risk as compared with human-driven vehicles. They found that people expect autonomous vehicles to be four to five times safer than human drivers and that the autonomous vehicles would have to reduce traffic fatalities by 75 percent before they would be accepted.

In a second paper Liu, Yang and Xu investigated the role of social trust and risk/benefit perceptions in the public acceptance of automated driving. The researchers employed a survey to measure three facets of acceptance: general acceptance of automated driving; willingness to pay for automated vehicles; and the intention to use, purchase or recommend automated vehicles. They found that social perceptions of trust directly affected all measures of acceptance.

The study by Brell, Philipsen and Ziefle also looked at risk and benefit perceptions by using a two-step empirical approach to explore risk perceptions of connected and autonomous vehicles in comparison to conventional driving. They found that autonomous driving was perceived as riskier but that increased experience with driver assistance systems resulted in decreased perceptions of riskiness.

The special issue concludes with a study aimed at understanding how feelings related to conventional driving affect the perception and acceptance of autonomous vehicles. Raue and her colleagues explored how feelings related to traditional driving were used as information to make judgments about self-driving cars. They also found that those who had more experience with vehicle automation technologies had lower risk and higher benefit perceptions, as well as higher trust feelings with regard to autonomous vehicles.

Articles included in this special issue:
- “How should autonomous cars drive? A preference for defaults in moral judgments under risk and uncertainty” by Björn Meder, Max Planck Institute for Human Development, Nadine Fleischhut, Max Planck Institute for Human Development, Nina-Carolin Krumnau, Max Planck Institute for Human Development, and Michael R. Waldmann, University of Göttingen
- “How safe is safe enough for self-driving vehicles?” by Peng Liu, Tianjin University, Run Yang, Tianjin University, and Zhigang Xu, Chang’an University
- “Public acceptance of fully automated driving: Effects of social trust and risk/benefit perceptions” by Peng Liu, Run Yang and Zhigang Xu
- “sCARy! Risk perceptions in autonomous driving – The influence of experience on perceived benefits and barriers” by Teresa Brell, Ralf Philipsen and Martina Ziefle, RWTH Aachen University
- “The influence of feelings while driving regular cars on the perception and acceptance of self-driving cars” by Martina Raue, Massachusetts Institute of Technology (MIT), Lisa A. D’Ambrosio, MIT, Carley Ward, MIT, Chaiwoo Lee, MIT, Claire Jacquillat, Carnegie Mellon University, and Joseph F. Coughlin, MIT

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