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Keeping eyes on the road: the role of situated IS delegation in influencing drivers' situational awareness

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Artificial intelligence (AI) and algorithmic technologies are becoming more and more ubiquitous in almost every facet of our personal and professional lives. They have driven innovative solutions and enabled the transformation of many industries and business sectors. One of the important application domains of AI and algorithmic technologies is the design of semi-autonomous vehicles. As a step forward towards self-driving or driverless cars, semi-autonomous vehicles are equipped with AI-powered driver-assistance systems that are designed to enhance driving comfort and improve driver safety. Although such systems are intended to improve driving decisions and prevent car accidents, there is a distinct challenge in realizing these design goals. Specifically, past research suggests that algorithmic aids deployed in semi-autonomous vehicles can give drivers a false sense of safety. The drivers tend to overutilize the aids, when their full attention is required in handling unexpected traffic situations. Such over-reliance on algorithmic technologies can paradoxically reduce drivers' attention, delay their responses to critical traffic events, and result in erroneous decisions and risky driving behaviors.

To understand the role of AI and algorithmic aids in influencing people's attention, decisions, and behaviors, this research centers on IS decision delegation in the context of semi-autonomous vehicles. In particular, we identify some key issues in the conventional AI design for gauging drivers' attention and propose a novel alternative. Drawing upon the concepts of agentic IS artifacts and situated IS decision delegation (Baird & Maruping, 2021), we suggest that an event-based attention gauging approach can help drivers form an accurate expectation of what an AI-enabled driver-assistance system can do and how it functions. Our key idea is to leverage the way AI algorithms pre-process various traffic events in guiding drivers' actions. By providing scenario-specific feedback, such an approach can integrate the decision process of a driver with that of the algorithmic aid. To this end, we show that the novel approach can generate a quicker alert to drivers than the conventional approach that relies on end-to-end processing of the traffic scenario. As an extension to this line of research inquiry, we will further investigate how users of the novel attention gauging approach and those of the conventional counterpart perceive AI technologies in terms of their transparency and predictability. We hypothesize that users of the novel approach are more likely to perceive AI technologies as transparent and predictable than those of the conventional approach.

The present research extends prior IS research on AI and algorithm-based IS design. The study findings can offer valuable insights into the mechanisms underlying situated IS delegation as well as users' perceptions of such decision delegation. They can also help inform IS practitioners of specific design principles that they can follow in the design and development of algorithmic decision aids for semi-autonomous vehicles.

References

Baird, A., & Maruping, L. M. (2021). The Next Generation of Research on IS Use: A Theoretical Framework of Delegation to and from Agentic IS Artifacts. MIS Quarterly, 45(1).