

Part 2: Design implication to resolve the phenomenon

To deal with the information overload problem in the driving context, it is crucial to introduce context-aware information filtering. This design suggestion can make the ITS system smarter to better meet the needs of drivers and improve road safety.

Based on multiple literatures, to implement context-aware information filtering function, the following aspects should be considered.

1)Real-time situation analysis: A study points out the importance of real-time situational analysis in intelligent transportation systems. Research by Wang et al. (2013) shows that by integrating information from GPS data, vehicle sensors and traffic monitoring systems, the system can monitor the driver's situation in real time, including traffic flow, weather conditions and road conditions.

Alavi et al. have also suggested that drivers should not only obtain information from traditional ways, with the improvement of computer computing power, vehicles can be connected to global intelligent transportation service networks, relying on ubiquitous sensors on intelligent lines. Infrastructure, developing real-time monitoring and control functions for large-scale transportation systems, enabling low-latency data exchange, and being able to provide drivers with more up-to-date news in real time. (2022)

For example, under normal circumstances, two driving cars can only judge whether they are too close to each other through visual inspection by the driver or induction by on-board sensors, and there is a risk of collision. But if both cars are connected to the intelligent transportation network, the system can determine the relative positions of the two vehicles through calculations and transmit the relevant information to the driver in real time.

This situational awareness helps the system provide navigation suggestions and traffic alerts more accurately, reducing the driver's cognitive load.

2)Intelligent information sorting: Based on real-time situational analysis, the system should be able to intelligently sort and filter information. For example, when driving on the highway, the system should prioritize displaying navigation instructions, traffic conditions ahead and vehicle health status, while suppressing irrelevant entertainment

information. The effectiveness of this design suggestion has been verified in multiple studies. Researchers have found that by adopting an information prioritization approach, drivers can increase their attention to vital information, thereby reducing driving distraction and improving road safety (Mohi-Alden et al., 2022).

3)Personalization: Drivers should be able to personalize settings according to their preferences to adjust the parameters of information filtering. This includes setting preferred audio or visual notifications, traffic information of interest, and safety and health reminders. Personalization is critical to improving user satisfaction and interaction experience. According to Deng et al. (2019), users prefer to be able to customize their information filtering settings to meet their specific needs and habits. This kind of personalization can increase the user's sense of control and comfort and improve their interaction with the ITS system.

4)Learning ability: The ITS system should be able to learn the driver's preferences and behavior patterns to continuously improve the accuracy of information filtering. For example, the system can learn the driver's preferences in specific traffic conditions and adjust the presentation of information accordingly. This point was studied in the study of Dejong (1990). He proposed a machine learning-based method to continuously improve the information filtering strategy by analyzing driver behavior and feedback. This adaptive approach adjusts to different driver preferences and needs, providing smarter filtering of information. This concept is still not out of date, and with the current advancement of computer computing power, big data language models such as ChatGPT have emerged. Some of the concepts proposed at that time can already be gradually realized. On the one hand, its system should have personalized attributes, and the driver can automatically set and adjust it according to his own preferences. On the other hand, its system should be able to learn the driver's driving rules and habits from the driver's decisions.

Taken together, context-aware information filtering is a key factor in improving driver interaction with intelligent transportation systems. Relevant research shows that this design proposal can reduce information overload, improve driver satisfaction, improve driver decision-making efficiency, and improve road safety. By combining real-time

situational analysis, intelligent information sorting, personalization and learning capabilities, intelligent transportation systems can better meet the needs of drivers and enhance their driving experience. Provide drivers with the most real-time and effective information and provide a personalized and intelligent driving environment. This design suggestion is expected to promote the further development of ITS systems to better adapt to increasingly complex driving scenarios and user needs.