AI application in road safety

❯❯ Driver-assist systems could analyse dangerous conditions and reduce crash incidents, says expert

■ BY **JOSHUA PURUSHOTMAN**
newsdesk@thesundaily.com

KUALA LUMPUR: Artificial intelligence (AI) can play a pivotal role in enhancing traffic safety and addressing the increasing number of road crash fatalities in Malaysia, said Prof Dr Manjit Singh Sidhu, from the College of Computing and Informatics at Universiti Tenaga Nasional.

Calling AI part of a multifaceted approach to mitigating automobile crashes in the country, he said a key application involves predictive analytics, in which AI algorithms analyse previous case data, traffic patterns and environmental factors to identify and predict possibilities in crash prone areas.

"This information can be used strategically to deploy resources such as law enforcement or road maintenance in high risk zones and prevent crashes before they occur," he said.

Manjit cited Transport Ministry records that showed there were 545,588 road crashes in 2022 with 6,080 deaths, and 370,286 in 2021 with 4,539 fatalities.

"A study by the Malaysian Institute of Road Safety Research also revealed human behaviour was the primary cause of road crashes, followed by factors such as the design and condition of road infrastructure, as well as the condition of vehicles."

He said road safety has been revolutionised by the fast-changing AI landscape, with vehicles now incorporating its technologies to elevate driving safety standards and even becoming driverless.

Some vehicles can also recognise possible risks and provide motorists with instantaneous guidance.

"Thanks to the development of AI, the distant dream of self-driven cars has become a reality now. These intelligent vehicles use sensors, cameras and sophisticated software algorithms to drive themselves without human intervention on the road.

"The systems have tremendously reduced crash incidents associated with human error as they can analyse huge amounts of data in a split-second."

Manjit said a major component of the rise in the automotive industry involving AI is the potential of improving road safety.

"The World Health Organisation estimates that globally, close to 1.35 million people die annually due to motor vehicle crashes. The incorporation of AI technology in vehicles can make a substantial difference by actively preventing collisions and reducing their severity."

Manjit said AI-powered smart traffic management systems could also optimise traffic flow.

"Adjusting traffic signals based on real-time data can reduce congestion and consequently, lower the likelihood of road crashes while integrating adaptive traffic management can change road conditions."

He said AI driver assistance systems offer another layer of safety, with features such as lane departure warnings, collision avoidance and adaptive cruise control that can alert drivers to potential dangers.

Manjit said the implementation of AI-facilitated vehicle-to-everything communication enables real-time exchange of information between vehicles, infrastructure and pedestrians, adding that such communication helps in avoiding collisions, particularly at intersections, by providing timely warnings.

Behavioural analysis and monitoring through AI could also be used to assess driver behaviour by analysing data from vehicles.

"Identifying patterns associated with risky driving allows for targeted interventions, such as providing feedback to drivers and insurers, ultimately encouraging safer driving habits."

Manjit said emergency response optimisation is another area AI can make a significant impact on road safety.

He said AI algorithms can predict accident severity and enable quicker dispatch of appropriate resources for emergency response. Such timely assistance can reduce the impact of crashes and enhance overall road safety.

"Ultimately, Malaysia needs a comprehensive strategy that integrates all these AI applications with effective policies, public awareness campaigns and law enforcement efforts.

"Collaborative efforts between government agencies, the private sector and technology developers can ensure the successful implementation and sustainability of these initiatives and contribute significantly to reducing vehicle crashes and fatalities in Malaysia."