AI IN CRASH PREDICTION

Transportation Institute is harnessing the power of AI for yet another aspect of traffic management – safety

Researchers at Texas A&M Transportation Institute are using AI to predict exactly where and when crashes will occur so that road authorities can prioritise funding for safety improvements in a more targeted fashion than ever before.

Whereas traditionally such predictions would be made using a simple statistical model, AI algorithms can deliver much more accurate predictions, even down to the time of day an accident is likely to occur on a particular stretch of road.

"In the conventional model we just use roadway geometric information and traffic volume," explains Subasish Das, associate transportation researcher at Texas A&M Transportation Institute. "But other data such as operating speed – which is very important in predicting crash severity – and weather conditions, are never used in the statistical model. In the AI tools we can import this kind of granular information, which helps to make it much more accurate."

"In conventional statistical models, we develop annual crash predictions. So, we can say that on that road, annually, 20 crashes will happen. But in one AI project I recently finished for USDOT for their Safety Data Initiative project, we developed a daily model. And we are now trying to get even more detail, down to daytime crashes versus night-time crashes."

To get predictions with this level of detail, big data is required – on average each state in the USA has around 80,000 miles of roadway, operating 24 hours a day, 365 days a year. "Conventional statistical models cannot process that kind of information," says Das. "We need some advanced AI to get that done and from there we can offer predictions that are daily or even hourly."

Once the predictions are delivered, road authorities can view them on a heat map to help decide in which areas they will invest in countermeasures in an attempt to improve safety and cool the accident hot spots.

> # WE ARE NOW TRYING TO GET EVEN MORE DETAIL, DOWN TO DAYTIME CRASHES VERSUS NIGHT-TIME CRASHES

Subasish Das, associate transportation researcher, Texas A&M Transportation Institute

equally, I know that Covid will last quite some time, and it will not outpace micro-transit. There is definitely a huge demand for that in the US, because we're so spread out. So, there has been a little bit of a pause, but we are seeing transit ramp back up in general now."

A recent example of EventFlow in action was when it was able to predict the scale of recent Black Lives Matter protests and ensure that city managers were not caught unawares by the popularity of these events. And, being AI, the more it's used, the more accurate it will get.

"One of the greatest things about AI is that it learns," says Parker. "It might say, 'OK, there was an informal religious gathering this size and with this popularity. And then there was this informal gathering for rights of individuals it had this level popularity, and it was this large.' It's always learning over time."

EventFlow can also predict how the popularity of an event might be affected by external factors