

An intelligent system that predicts traffic flow

NTU researchers' program can forecast conditions an hour in advance

By FENG ZENGKUN

IMAGINE an intelligent program that can recommend routes to drivers, and adjust those routes based on predictions of future traffic conditions.

Motorists could find driving a breeze in two years' time if such a computer system, in the works by researchers at Nanyang Technological University (NTU), makes it to the market.

The team has created its main component – a prediction system which forecasts traffic flow on roads up to one hour in advance – and a member will present the research behind it today at the annual Intelligent Transportation Systems Conference in Anchorage, Alaska.

The conference is organised by the Institute of Electrical and Electronics Engineers, which has more than 400,000 members in more than 160 countries.

The NTU team's prediction system relies on a database of previous traffic flows on the roads.

The Land Transport Authority divides the road network here into segments, and tracks the average speed of cars on each segment every two minutes. Each segment is 120m long on average.

If the average speed on a road segment slows down over time, it means the segment is becoming congested.

The researchers plugged two months' worth of data collected in March and April last year into their computer system to create a

database of traffic patterns.

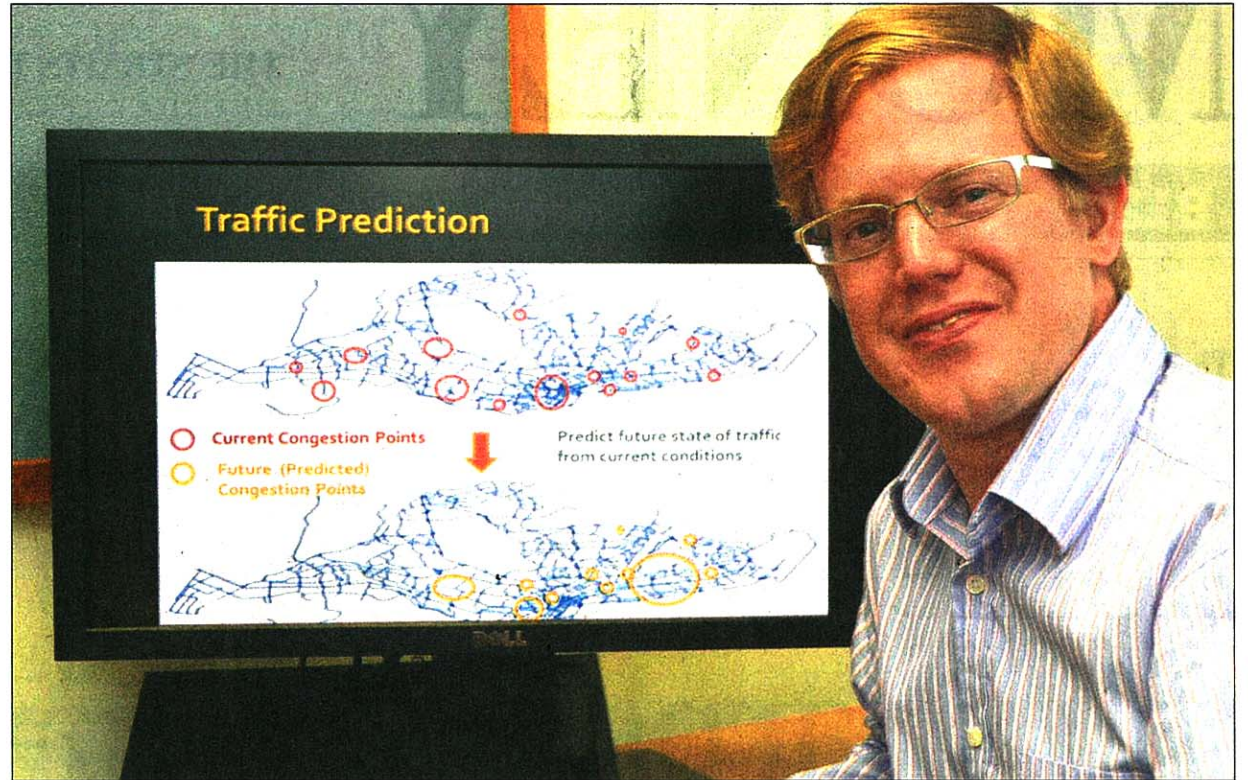
To predict whether a road will be congested, the system looks at the past data to find the most similar set of road conditions for the same spot and time of day.

What happens next should be the same on both days, allowing the system to create the prediction.

Dr Justin Dauwels, 34, an assistant professor at the NTU School of Electrical and Electronic Engineering, said tests showed that the system's predictions were 95 per cent accurate for highways and 85 to 90 per cent accurate for small roads.

But he noted that the system does not take into account outlying events such as floods, changes in speed limits or the building of new highways.

The team plans to make the prediction system more nimble by enabling it to collect other data, such as weather forecasts and information on accidents and other



Dr Justin Dauwels showing his team's research that can predict traffic conditions on Singapore roads. Tests have shown that its predictions were 95 per cent accurate for highways and 85 to 90 per cent accurate for small roads. PHOTO: NTU

events. This can be done by tapping data from government agencies and social media sites.

Dr Dauwels added that the route recommendation system would also offer drivers different options.

"If it gave everyone the same route, we would end up creating new congestions ourselves," he said.

Researchers in other countries, such as the United States and China, and companies, such as com-

puter giant IBM, have also worked on traffic prediction systems.

IBM tested a system here between 2006 and 2007 with results that were over 85 per cent accurate up to one hour in advance.

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