

Traffic and Safety Monitoring

The principle

Efficient traffic management relies on up-to-date information about the state of the road network. As more traffic and other data sources become available, more accurate estimation and prediction of road traffic conditions utilising all data sources is becoming essential to reduce congestion and increase traffic safety.

The rationale

Increasing amount of data are being collected and often for one specific application. If these data are converted into useful traffic indicators describing the traffic conditions, appropriate traffic management plan can be activated. Pro-active traffic management actions can be taken more efficiently if traffic conditions are predicted a short time ahead. The INTRO "Traffic and safety monitoring" strand focuses on developing methodologies for predicting traffic conditions and for monitoring traffic safety using data measured from traffic sensors and float car data. The effect of weather on traffic conditions is also an important factor to be taken into account. Furthermore, knowing when traffic conditions are unsafe and acting on this information to warn drivers still needs investigation. The outcomes from this research will improve prediction of traffic conditions and evaluation of traffic safety, leading to safer driving condition and better use of road network.

The practice

First the most relevant traffic indicators characterising traffic flow conditions for different applications will be evaluated and selected. Methodologies for dynamic traffic indicator estimation using floating car data from two floating car trials in Stockholm and Vienna will be developed; and the methodologies evaluated using traffic simulation.

Traffic data collected by different sensors, both fixed and mobile and weather data will be investigated in order to demonstrate a method for fusing data to provide a consistent and comprehensive picture of network traffic conditions. The data fusion technique takes into account the qualities and imperfections of each source and combined the data to generate a single estimate of traffic conditions in areas of the network where data is available.

Inclement weather condition affects driving behaviour, traffic safety and traffic capacity. To investigate the weather effects, quantitative analysis on the changes in traffic characteristics under various weather conditions, and study on the effect of fog using driving simulator will be carried out.

Finally, relevant safety indicators to estimate and forecast the safety level at different locations on the road network will be formulated. A well calibrated and validated traffic simulation against observed accident data will also be employed to simulate different scenarios to evaluate the sensitivity of the safety indicators formulated.

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