

## Demonstration paper for ICME 2012

# LOOK2 - A video-based system for real-time notification of relevant traffic events

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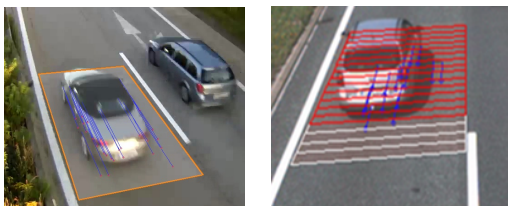
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**Abstract**—We demonstrate our novel video-based real-time traffic event notification and verification system LOOK2. It generates fast and reliable traffic information about relevant traffic state and road conditions changes on observed roads. It utilizes installed road-side sensors providing low-level traffic and environmental data, as well as video sensors which gain high-level traffic information from live video analysis. Spatio-temporal data fusion is applied on all available traffic and environmental data to gain reliable traffic information. This traffic information is published by a DATEXII compliant web service to a web-based traffic desk application. Road network and traffic channel operators receive real-time and relevant traffic event notifications by using this application. The system also enables a visual verification of the notified situations.

LOOK2 is a video-based traffic event notification system for road network and traffic channel operators. It generates fast and reliable traffic information about relevant changes of the traffic state and road conditions in real-time. Therefore, it makes use of installed, common road-side sensors providing low-level traffic and environmental measurement data, as well as video sensors which gain high-level traffic information from live video analysis. The live stream analysis is done either in the compressed video domain as added value to simple, installed surveillance cameras, or in the uncompressed video domain on smart cameras. Figure 1 illustrates the applied method for estimating the mean speed (Figure 1(a)) and traffic density (Figure 1(b)) for individual lanes in the uncompressed video domain.



(a) Motion vector extraction (b) Occupancy computation

Figure 1. Traffic speed and density estimation.

For the compressed video domain, a feature-based traffic state estimation method is applied. The method performs statistical computations on motion vectors and applies supervised learning to estimate the prevailing traffic state.

The gained high-level traffic states are spatio-temporally fused with all available low-level measurements of installed sensors on the roads. The fusion results are then published by a DATEX II compliant service to a web-based traffic desk application. With this application, traffic operators and editors are notified about relevant traffic state and road condition changes on the monitored roads in real-time. A direct relation of published events with available traffic cameras enables for an instant event verification (Figure 2).

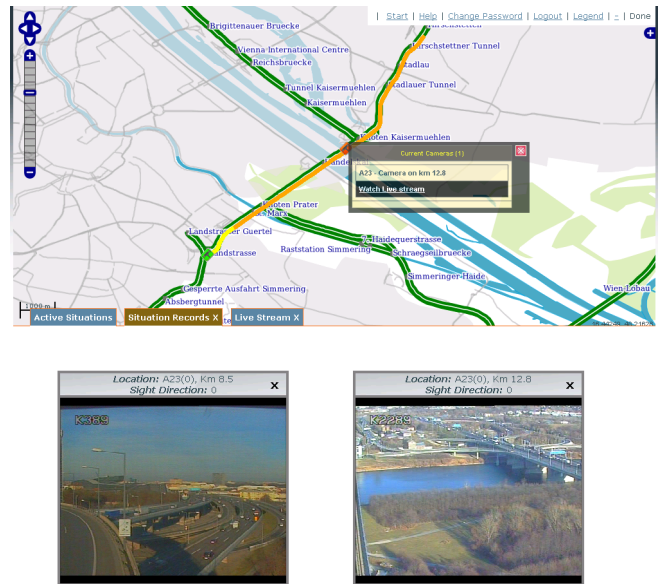


Figure 2. Real-time traffic state verification with camera live streams.

The LOOK2 system has been developed together with ASFINAG - the Austrian operator of motorways and expressways - and has been tested by traffic editors in the production environment for several months.

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