

VISIBILITY MONITORING AND FORECASTING SYSTEM FOR TRAFFIC SAFETY

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The interest in short-term weather warnings with higher localization accuracy has been increased recently. The significant and hazardous meteorological events jeopardise many activities of the society especially traffic.

Almost all fog events in Dubai region are of radiation origin culminating in the early morning hours of the traffic rush. Several fog events were cause of serious traffic incidents. Ghantoot incident (accident near Ghantoot, UAE with more than 200 cars involved in 2008) aroused interest of Dubai Municipality for possibilities to monitor and also forecast fog events. It resulted in cooperation with Microstep-MIS Company.

Our solution is **Visibility Monitoring and Forecasting System for Traffic Safety** (2009) in Dubai which consists of:

- 14 automated weather stations for visibility and other weather condition monitoring, majority of stations have also camera
- Climatological database UDCS/CLDB (for data collection and storage)
- Web Real-time display to monitor actual weather condition online
- Weather prediction modul
- Fog prediction modul
- Sandstorm prediction modul
- Satellite images browser

The Groundwork for **fog predictions** comes from three sources:

- Physical model outputs (3D model WRF, 1D model Pafog)
- Model based on data mining methods
- Satellite images with high frequency (5-min, 15-min)



Fig. 1. Output of the Visibility Monitoring and Forecasting System for Traffic Safety

The **sandstorm modelling system** is based on the art of 3D numerical weather prediction and model for sand dispersion. Outputs of sandstorm modelling:

- Maps of sand particles uplift and dispersion two times daily (run 0000 and 1200UTC)
- Sandstorm warning icons for whole Dubai area

Part of our Visibility Monitoring and Forecasting for Traffic Safety System in Dubai is **real time display** - tool to monitor decrease of the visibility and other measured weather parameters online in real time at all stations.

There is also possibility to analyse all measured data retrospectively, because they are all saved in **Climatological database**. There are also tools to filter, select and visualise measured data.

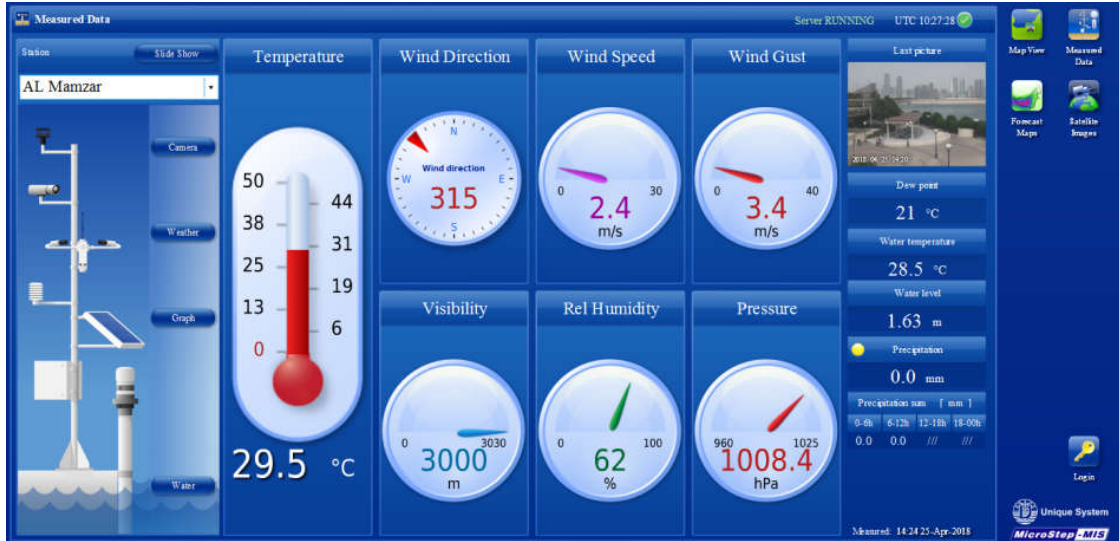


Fig. 2. Real-time display

Other strong tool to monitor fog or sandstorm development are satellite images. Our Visibility Monitoring and Forecasting System consists of **Satellite images browser** which allows to monitor situation on different satellite RGB composites online.

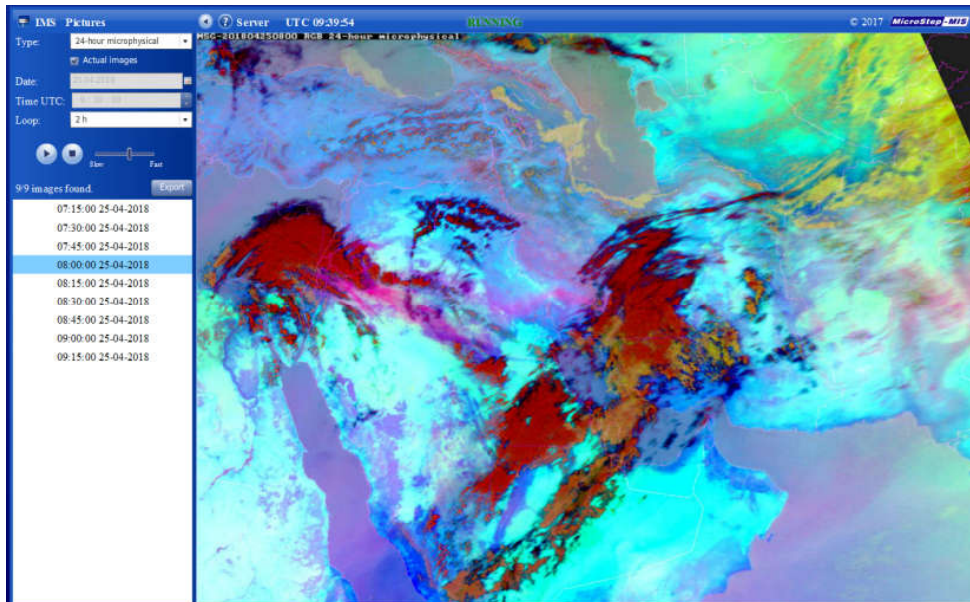


Fig. 3. Satellite images browser