A SYSTEM TO AUTOMATE TRAFFIC MANAGEMENT PLANS

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Abstract

The evolution of the technology has made possible the application of more sophisticated systems and knowledge models to traffic control and management, the Intelligent Traffic Systems (ITS). These systems are suitable tools to control and automate traffic tasks and allow to traffic managers to improve traffic flows and road safety.

The present paper shows the evolution of the software application to automate traffic management plans (TMP) for weather problems. Basically a TMP is structured in three levels of information: scenarios, measures and actions. The scenario defines the current situation of the incident. The measures define the set of procedures to be applied depending on the scenario and the actions define the activities to develop each measure. The development of the plans goes from the traditional versions in paper format up to the new version using a Multiagent system. The new version includes a TMP formal definition in XML.

The XML approach improves the use of traffic management plans. This format facilitates the computerized use of the TMPs in different tasks: Creation, modification and upgrading TMPs, exchange traffic information between Traffic Control Centres and develop intelligent system to automate the information provided by traffic data capture stations.

A cooperative multiagent system has been developed to help road traffic operator using the XML-TMP format. The main agents that compose the system are: Meteo agents which monitor weather parameters. Manager agent is responsible for processing the information provided by meteo agents. When a weather problem appears, it determines the road event and the current scenario. TMP agent chooses the measures and actions to be developed. Web agent uses the information of the road event to exchange information with other web services. All these agents use communication protocols to control and to coordinate the multiagent system.

A Spanish road motorway has been simulated in order to test the system. The evaluation of first results are positives, the system allows: 1) to monitor a huge road network, 2) to detect automatically weather incidents and 3) to propose control and management traffic measures compatibles with the current traffic strategies.