Секція 2.
ТЕХНІЧНА ЕКСПЛУАТАЦІЯ І СЕРВІС АВТОМОБІЛІВ

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CYBER PHYSICAL MONITORING TRANSPORT TECHNICAL CONDITION

The quality of transport services depends on the reliability and satisfactory operation of all its components. Therefore, remote online mode to obtain information about the condition and positioning of each car is one of the essential services for trouble-free operation of cyber physical transport system constructed by Internet of Things technologies.

The innovative idea of intelligent cyber physical transport system (ICTS) is not inform after the accident fact by using contents of the black boxes, but to prevent collision on the basis of continuous monitoring. In order to ensure the timeliness and accuracy of parametric information delivering it is necessary to diversify telecommunication channels of data from each vehicle to the control cloud.

It is necessary to use the channels of satellite and differential positioning GPS, GLONASS, mobile channels, telematics, including online Wi-Fi-car communication with each other and with the road infrastructure transponders (wireless protocol Wi-Fi, 802.15.4, BT, Lora, Cellular). Thus, ICTS allows remotely monitoring the car parameters and the transports route, performing diagnostics, simple repairs and emergency control of a vehicle in the critical situations.

For the implementation of the mentioned services within ICTS computing components are leveraged as on-board vehicle equipment, specialized applications, transceivers, electronic gadgets including mobile [1].

On the side of the cloud control and monitoring should be fog network of transponders mounted in the road infrastructure for telemetry data collection and transmission to the local and/or global big data centers. Services of traffic control clouds perform data analysis on each vehicle and local traffic situations with the subsequent sending actuation sygnals to drivers and traffic lights.

Cyber physical infrastructure of the exact transport monitoring and control contains each vehicle cloud office [2], interacting with telematics module satellite navigation and communications, driver, on-board monitoring system, storage and data transmission, automatic vehicle identification means.

Extremely important innovation is an anonymous delegate of his vehicle positioning and routing to the cloud service of monitoring and traffic control. This makes it possible to optimize traffic flows in the local and global scale by issuing recommendations for moving through the problem traffic area when booked route in advance. For the driver's knowledge of traffic conditions on the movement route would eliminate the emergency situation on the basis of accurate prediction of traffic signals and collision with the car driving out from the visually closed crossings. This vital information should be supplied to the vehicle screen from cloud service in order to warn the driver of a possible collision, while maintaining the same motion parameters.

Cloud micro services of the transport enterprise include functionality: protection, storage and analysis of data, vehicle identification, monitoring and diagnostics of technical condition, prediction of operational parameters of the vehicle components [3], the control operability of the vehicle park [4]; monitoring the impact of transport on the environment and decision-making to prevent its contamination; energy saving [5, 6, 7].

Thus, the positioning and monitoring of the vehicles positioning and movement in automobile companies and their subsequent cloud management enables to optimize the execution of orders for transportation of passengers and cargo, significantly reduce material and/or time-consuming. It should be noted that the monitoring parameters of the technical condition of vehicles in the framework of cloud services enables transport companies to eliminate accidents in the operation of road transport, and thus to significantly increase revenues.

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