

УДК 629.047.6

Вовк Я. – учень 11 класу

Тернопільський технічний ліцей

ТЕЛЕМАТИЧНІ ДАТЧИКИ В АВТОМОБІЛЬНОМУ ТРАНСПОРТІ: ПЕРСПЕКТИВИ РОЗВИТКУ

Науковий керівник: к.т.н., доц. Вовк Ю.Я.

Vovk Ya.

Ternopil Technical Lyceum

TELEMATIC SENSORS IN ROAD TRANSPORT: DEVELOPMENT PROSPECTS

Supervisor: PhD, Assoc. Prof. Vovk Yu.Ya.

Ключові слова: Телематичні датчики, автомобільний транспорт, інтелектуальні транспортні системи

Keywords: Telematic sensors, road transport, intelligent transport systems

Telematics sensors are electronic devices that use telecommunications technology to transmit data about physical conditions or events from remote locations to a central data processing system. They are used in various industries, including automotive, in intelligent transportation systems, to improve efficiency, safety, and productivity (Vovk, 2016). In the automotive industry, telematics sensors monitor and transmit data on various aspects of vehicle performance, including speed, location, and fuel consumption.

There are several types of telematics sensors used in motor vehicles, including:

Global Positioning System (GPS) sensors use satellite signals to determine the vehicle's location.

Accelerometers: These sensors measure the acceleration of a vehicle and can be used to detect sudden changes in speed or direction.

Gyroscopes: These sensors measure the vehicle's rotation and can be used to detect changes in direction.

Fuel gauges: These gauges measure the fuel level in the vehicle's tank and can be used to monitor fuel consumption.

Engine Sensors: These sensors measure various aspects of the vehicle's engine performance, including temperature, pressure, and speed.

According to a study by Frost & Sullivan (2021), the global market for automotive telematics sensors is expected to grow significantly in the coming years due to the growing demand for connected vehicles and the increasing adoption of electric vehicles. The study also highlights the potential of telematics sensors to improve vehicle safety and reduce the risk of crashes by providing real-time data on driver behavior and road conditions.

Another study by MarketsandMarkets (2020) predicts that the automotive telematics sensor market will grow by 11.3% between 2020 and 2025, driven by growing demand for advanced driver assistance systems (ADAS) and the increasing adoption of electric and hybrid vehicles. The study also highlights the potential of telematics sensors to enable predictive maintenance and reduce vehicle maintenance downtime.

Overall, telematics sensors have shown great potential in the automotive industry and are expected to play an increasingly important role in improving vehicle performance, safety, and efficiency.

One potential development area is using advanced driver assistance systems (ADAS) to improve vehicle safety and driver comfort. ADAS systems rely on sensors that can detect and respond to changes in the vehicle's environment, including other vehicles, pedestrians, and road conditions.

One type of sensor already used in some ADAS systems is the LiDAR sensor, which uses laser pulses to create a 3D map of the car's surroundings. This can provide more detailed and accurate environmental information than traditional sensors such as cameras or radar.

One development area is the use of advanced driver assistance systems (ADAS), which rely on a range of sensors to detect and respond to changes in the vehicle's environment. These sensors include cameras, radar, and LiDAR, which use lasers to create 3D maps of the vehicle's surroundings. By combining data from these sensors, ADAS systems can provide a complete picture of the vehicle's environment and respond to potential hazards more quickly and effectively.

Another development area is using sensors to monitor vehicle occupants' health and well-being. For example, sensors could be used to detect the presence of alcohol or drugs in a driver's breath or to monitor their heart rate and other vital signs. This could help to reduce the risk of accidents caused by driver impairment or health issues.

In addition to these areas, there is also potential for developing sensors that can monitor and transmit data about the condition of roads and other infrastructure. This could include sensors that detect potholes, cracks, and other damage to road surfaces, as well as sensors that monitor traffic flow and congestion. By providing real-time data on road conditions, these sensors could help improve transportation networks' safety and efficiency.

Overall, the development of new types of telematics sensors is likely driven by the need to improve vehicle safety, efficiency, and sustainability and the increasing demand for connected and autonomous vehicles. As technology advances, we will likely see even more innovative and powerful sensors being developed that can help transform the automotive industry.

References:

Frost & Sullivan. (2021). Global Automotive Telematics Sensor Market Forecast to 2025. Retrieved from <https://store.frost.com/global-automotive-telematics-sensor-market-forecast-to-2025.html>

MarketsandMarkets. (2020). Automotive Telematics Market by Channel, Vehicle Type, Services, Form Factor, Connectivity, and Region - Global Forecast to 2025. Retrieved from <https://www.marketsandmarkets.com/Market-Reports/automotive-telematics-market-120.html>

Vovk, Y. (2016). Resource-efficient intelligent transportation systems as a basis for sustainable development. Overview of initiatives and strategies. *Journal of Sustainable Development of Transport and Logistics*, 1(1), 6–10. <https://doi.org/10.14254/jsdtl.2016.1-1.1>