

## ABSTRACT

Master's thesis: 103 pp., 34 fig., 7 tab., 1 app., 106 sources.

**The relevance.** Prediction state of the vehicle is an important task for the business associated with repair, creating cars or logistics. Using these forecasts will allow manufacturers to improve car parts, repair service quicker to restore the car by prior purchase necessary components. Logistics companies can use this information to optimize traffic for time maintenance and fleet of problematic drivers operating vehicles improperly. In this regard, the actual scientific task is to develop efficient algorithms for data analysis operation of cars and later use them for forecasting of vehicle components and the vehicle as a whole.

**Relationship with academic programs, plans, themes.** Master's thesis is executed according to plan in processes managed optimization department at Institute of Cybernetics of V.M. Glushkov NAS of Ukraine within the research theme «To develop mathematical tools, aimed at creating intellectual information technologies for solving problems of combinatorial optimization and information security» (state registration number 0117U000323, 2015-2017).

**The purpose and objectives of the study.** The aim is to prevent failure of the vehicle components needed for preliminary replacement parts and estimate the remaining life of the vehicle.

To achieve the goal must perform the following tasks:

- perform a review of known algorithms forecasting, including the use of statistical methods and machine learning;
- identify the most relevant for predicting data received from vehicles;
- develop a method for forecasting the battery electric vehicles;
- develop an API for integration algorithm telemetry system of motor vehicles;
- examine the reliability of forecasts.

**The object of study** forecasting process faults car.

**The subject of the study** heuristic forecasting of vehicle components.

**Methods** in paper are based on methods of statistical forecasting, heuristics prediction methods to prevent malfunctions

**The scientific novelty of the results** is to establish principles using empirical algorithms for predicting fault vehicle based on the data received in real time and results of the maintenance and use of these algorithms to assess the viability of the components of the vehicle.

**Publications.** Work results are published in conference abstracts of International Scientific Conference «iScience» [103], in the scientific journal «Young Scientist» [104]

PREDICTION, STATISTICAL FORECASTING METHODS, RESIDUAL LIFESPAN WARNING MALFUNCTION, MACHINE LEARNING, VEHICLES, TELEMETRY DATA, COMPONENTS.

