ABSTRACT

Current thesis contains 97 pages, 6 tables, 22 figures and 21 bibliographic references.

SYSTEMS OF AUTONOMOUS CONTROL, ARTIFICIAL AGENTS, COMPLEX DECISION MAKING, ARTIFICIAL INTELLIGENCE, OPTIMAL STRATEGIES, REINFORCEMENT LEARNING.

Object of research: autonomous agents for the adoption of complex solutions in the automotive industry and robotics.

Purpose: to design and develop a module of deep reinforcement learning for the needs of the autonomous control system in the system of motor transport.

Subject of research: mathematical models and methods of the artificial agents; system of complex decision making.

The thesis analyzes the methods of machine learning, reviews the existing systems of autonomous driving.

Results of work:

- Several architectures of the unmanned vehicle agents were proposed;
- the offered algorithms are realized and the analysis of efficiency of their work on several criteria is carried out;
- A client for the desktop version has been developed.

Novelty of work:

- the use of Reinforcement Learning methods during construction of the system is substantiated;
- A set of criterias has been selected that can characterize the quality of the agents;

The results of this work are recommended as a basis for the development of agents that will operate in real-time interaction with other road users. For further research in this area, it would be advisable to study approaches to the analysis and processing of more complex factors available in this system, such as: weather

conditions, pedestrian interaction and control signals. The prospect of this study is to create a real prototype based on diesel-engined car designed to drive on the roads of Ukraine.