

UDC 004.837

## **FEATURES OF INTELLECTUAL SAFETY MANAGEMENT OF PREMISES BY MOBILE ROBOTS**

**<sup>1</sup>Tokhtar B., <sup>1</sup>Kaztaeva D., <sup>2</sup>Tulkibai S., <sup>2</sup>Suindikov E.**

deka12.10.96@mail.ru

<sup>1</sup>Master students of Space Engineering and Technology L.N. Gumilyov ENU,  
Nur-Sultan, Kazakhstan

<sup>2</sup>Students of Space Engineering and Technology L.N. Gumilyov ENU  
Nur-Sultan, Kazakhstan

Scientific adviser – Moldamurat Kh.

Currently, more and more people are thinking about ensuring the security of their property and housing. This fact is associated not only with criminal risk, but also with the risk of man-made accidents. In everyday life this could be a gas leak, flooding or fire. Therefore, it is important to create an intelligent security management system that combines all the advantages of typical security systems: affordable pricing, ease of maintenance and installation. full autonomy through the management of an artificial intelligence system.

Keywords: robotics, control systems, artificial intelligence, safety, industrial robot.

A single, generally accepted definition of modern robots and the generally accepted classification does not yet exist. However, many definitions are similar to each other and in one form or another reflect the fact that the robot actively interacts with the external environment and at the same time manifests some elements of rationality.

First of all, the general concept of “robot” is interpreted by individual authors in different ways [1,2]. For example, in the technical literature one can come across the following definition: a robot is an autonomously functioning universal automatic machine designed to reproduce certain physical, motor, and mental functions of a human, endowed with some kind of feedback means (hearing, seeing, touch, etc.), as well as the ability to learn and adapt in the process of active interaction with the environment.

Since the advent of the first industrial robot, three bots of robotization have passed. The first one began in 1968 using microprocessors to control robots and quickly ended due to the unreliability and imperfection of first-generation robots. The second boom is associated with the advent of adaptive robots in 1972, when the possibilities of robotics began to expand. The appearance in 1980 of robots with elements of artificial intelligence was the beginning of the third boom of industrial robotics.

Currently, there are about 2 million robots in the world - industrial, domestic and toy, and sales of the last two categories are growing rapidly.

The main base of hardware mechanisms is concentrated in Japan, Europe, North America. Of course, we are lagging behind in this area a few years ago, but President NursultanNazarbayev pays more attention to this issue, big money is allocated, all conditions are created for the development of modern robotics. Robotics lessons are being introduced in universities, schools, specialties in this specialty are being opened.

Of course, most robots are used in industry - about 1 million. About half of them work in Japan. In Europe - 300 thousand, in North America - 150 thousand industrial robots used mainly on assembly lines [3].

Further research on new types of mobile robots is stimulated by numerous applications in the most diverse areas of human activity (vehicle traffic control automation, combating terrorism and demining suspicious objects, working in conditions of heavy smoke during fire extinguishing, inspection of territories, contaminated chemicals, self-patrolling of designated areas, etc.).

In operation, the robot can use a video camera, analogs of a thermal imager, sound sensors, pyroelectric sensors, position sensors, internal sensors of a robot, a laser range finder, a radar, air quality sensors, a microphone [4].

Among the added options are GPS, night-vision cameras, biological, chemical systems, as well as the background radiation detection system.



Picture 1 – Smart rooms mobile robots

It is not difficult to guess how robots would make our lives easier and more secure, protecting our homes, doing our chores, helping us in our workplaces. These robots will be able to control and secure residential and business premises from emergency situations. Their mission is to protect an apartment or office, in cases of fire, burglary or other emergencies, to send to the cell phone or selected owners an e-mail address to record any “disorder”.

In order to perform actions without human intervention (usually in a non-deterministic, changing environment), robots must have artificial intelligence. In this regard, unlike other robots, mobile robots with automatic control in information sources are usually called autonomous. Autonomous mobile robots are robots that are able (depending on the signals from the sensors) to make decisions in a changing environment. Sometimes they are also called self-learning robots.

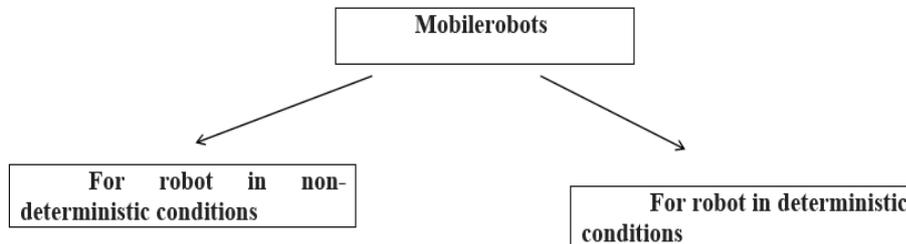
Artificial intelligence is a scientific field that develops methods that allow an electronic computer to solve intellectual tasks, if they are solved by a human. The concept of “artificial intelligence” refers to the functionality of a machine to solve human problems. Artificial intelligence is aimed at improving the effectiveness of various forms of human mental labor. An intelligent robot is a robot whose control program can be fully or partially automatically generated in accordance with the set task and depending on the state of the working environment.

A distinctive feature of intelligent robots is their ability to learn by experience and adapt in the process of solving problems. In general, an intelligent robot is able to carry on a dialogue with a person, to form a model of the production environment. Recognize and analyze situations, learn concepts and skills, plan behavior, build program movements of the locomotor system and carry out

their reliable testing in the conditions of obstacles and incomplete awareness of changing production conditions.

Table 1

Software development of the touch platform mobile system



In connection with the rapid development of neuro computers and neural network technologies, it became possible to create fourth-generation robots - robots with neural control systems. The principles of neural control are largely similar to the principles of the brain and the nervous system of man. Such systems do not program in advance. They are trained and self-organized to solve various motor, information and intellectual tasks [5].

An intelligent robot is a robot whose control program can be fully or partially automatically generated according to the task set and depending on the state of the working environment. It was the desire to replace a person with hard and dangerous jobs that gave rise to the idea of a robot, then the first attempts to implement it (in the middle ages) and, finally, led to the emergence and development of modern robotics and robotics. In the near future, there will surely be a few robots in every home house that will do all the domestic boring work. The introduction of robots in everyday life is becoming not only fashionable, but also useful.

### Literature

1. Makarov I. M., Topcheev Yu.I. Robotics: History and Perspectives//M.: Science; MAI Publishing House, –2013. –P.349.
2. Isagulova J.R., Atanov S.K. “Features of hardware implementation of information protection in microcontrollers of automatic control systems I International Scientific and Practical Conference” Information Security in the Light of the Strategy Kazakhstan - 2050”, Astana, – September 2014, –P.302.
3. Atanov S.K., Moldamurat H. Microcontroller implementation of fuzzy logic in artificial intelligence systems//Bulletin of ENU named after L.N. Gumilyov, –2012, –P.226-228.