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THE DIRECTION OF DEVELOPMENT OF SERVICE ROBOTS

In this article describe such directions can be evolved in the development of service robotics. Dynamics of development and expected trends in robotics require consistently high activity in the research and development of service robots. This fact supports and structures sectors and scientific - research area of service robots, which can be understood as an open system with continuous refilling and refinement.

Keywords: service robots, development trends, modular robots.

Introduction to the topic

Analysis of global surveys on the structure of the sale of each category of robots confirms that in addition to possession of pace in "traditional" categories of robots (industrial robots) recorded significant expansion of the "new" category of robots (service robots). This fact significantly affected and continues to affect global trends in robotics. The need for service robots induced penetration of automation and robotics in non-industrial practice, which determines the requirements for their functional features and characteristics arising from their destination for technology and technically new tasks in the service activities carried out in the application and operationally new environment. The term service activities are understood non-productive activities (services, service activities), which do not contribute to the industrial production of goods, but are useful to humans or the operational and technical systems. According to a survey of the European robotic Agency (Europe) is Europe's position in the field of robotics close to the Japanese world leadership position. In Japan, the priority of service robots, whose structure is analogous to the construction of the human body. In Korea, for 10 years has been declared a national program that aims to gain leadership in industrial and service robotics. In Europe, the EU Member States for intensive use and development of robotics framework programs to promote research and development. These characters jotted down by Europe's research status and level of research robotics in the world.

Main directions of development

Development is moving innovative approaches to the design and arrangement of the embodiment of the action and locomotor mechanism of robots induced by applying knowledge Biorobotics, application of generations and innovative new features and components for the construction of the mobile service robots. Basis for routing own development of service robots are derived from:

1. The development of automation - Robotics - requirements, needs and problems of the kind given to the development of robotic devices and robotic systems are caused by:

- development of automation of production, non-production and service processes motivated by the need to stabilize them and increase the quality, maintaining and increasing their productivity, increase their flexibility;
- upgrading of existing and development of new technologies, manufacturing, non-manufacturing and service processes with regard to their automation;
- development requirements to minimize technological and handling operations in the implementation process;
- development of hybrid structures of automated production systems to the new role of man in the system
- development of structures of automated production systems through reducing the number of elements in the structure and consequently reduce the number of their links
- development of new structures of automated production systems through application of parallel mechanisms in the construction of their elements;

- stronger linking principles of technical (technological) and biological structures in approaches compilation robotic equipment and systems - qualitative breakthrough in artificial systems capabilities, which "intelligence" will be able to carry out internal processes of intelligence - is the limit "intelligence" on the basis of intelligence core of man-made;
 - integration means of automation and information technology (software management systems), diagnostics and automated security systems; component-based automation for modular manufacturing technology and machine design - Totally Integrated Automation capable of full automation with distributed intelligence, creating automated systems based on prefabricated components and subsystems (reuse), defined communication interface allows to combine components from different manufacturers (universal connectivity, support standard technology, openness, universal applicability, comprehensiveness solutions);
 - the emergence of new principles and a new generation of components for the construction of robotic devices (mechatronic approach, biomechanical principles of integrated intelligent components and elements ...);
 - the emergence of new categories of robots, which are intended mainly in non-traditional application areas and new destination;
 - intensifying automation of production / non-production processes on the principles of BMC models (Bionic Manufacturing Systems), IMS (Intelligent Manufacturing Systems), CHIM (Human Computer Integrated Manufacturing), ICIM (Intelligent Computer Integrated Manufacturing), AI - Agents - Holons - Fractals, etc., new systemic approach to the interpretation and application;
 - application of robots in dangerous and unhealthy environments based dynamization current social requirements (nuclear energy, military, security services, chemical industry, pharmaceutical industry, forestry and agriculture, health, social services, ...);
2. general trends in the development of machines (technical systems for power transmission and information) - development of structures robotic device is triggered by:
- development of structures of machines, multifunction machines, combination of kinematic structures, the combination of power transmission systems, a high proportion of electromechanical components, a high proportion of electronic components, a high proportion of programmable resources and the operation of the machine, the impact of non-conventional technologies;
 - general trends in automation service activities - development of service robotics systems and related technology development service forms the set of new requirements for the development of service robots,
 - general trends biorobotics (the study of biological systems and processes to exploit the knowledge and principles for solving robotics: biomechanism - construction engineering mechanisms for knowledge structures of living organisms and their behavior; biocontrol - Management of technical systems and systems for knowledge management physiological systems; biointegration - interpretation of knowledge and principles of discernment, decision making, planning, and the roles of the physiological systems of artificial intelligence to solve technical systems; biosensorics - interpretation of knowledge on perceptual systems physiological systems in dealing with intelligent sensor systems) - learning structures, concepts and principles biorobotics and transfer them to development and solutions for service robots.

Conclusion

Implied characteristic effects declares that the sector's own development of service robots in terms of objectives, charges and content is broad and diverse character. Despite this finding of parallel activities on the development of service robots can classify and characterize trends in:

- in the development of the principles of locomotion,
- in the development of design,

- in the development of control and navigation,
- in the development and operation of applications.

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