International Journal of Advanced Multidisciplinary Research (IJAMR)
ISSN: 2393-8870
www.ijarm.com
Coden:IJAMHQ(USA)

Research Article

Use of robotic system for creator's solution in completing the assigned task and dealing with the physics of the environment around it.

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Keywords

inspired robotics, information processing.

Abstract

Robotics is the branch of mechanical engineering, electrical engineering, electronic engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. Many of today's robots are inspired by nature contributing to the field of bio-inspired robotics.

Introduction

There are many types of robots; they are used in many different environments and for many different uses, although being very diverse in application and form they all share three basic similarities when it comes to their construction: Robots all have some kind of mechanical construction, a frame, form or shape designed to achieve a particular task. For example, a robot designed to travel across heavy dirt or mud, might use caterpillar tracks. The technical aspect is mostly the creator's solution to completing the assigned task and dealing with the physics of the environment around it.

Figure1. Diagram of robotic system interpretation

Robots have electrical components which power and control the machinery. For example, the robot with caterpillar tracks would need some kind of power to move the tracker treads [1]. That power comes in the form of electricity, which will have to travel through a wire and originate from a battery, a basic electrical circuit. Even gas powered machines that get their power mainly from gas still require an electric current to start the gas using process which is why most gas powered machines like cars, have batteries. The electrical aspect of robots is used for movement (through motors), sensing (where electrical signals are used to measure things like heat, sound, position, and energy status) and operation .

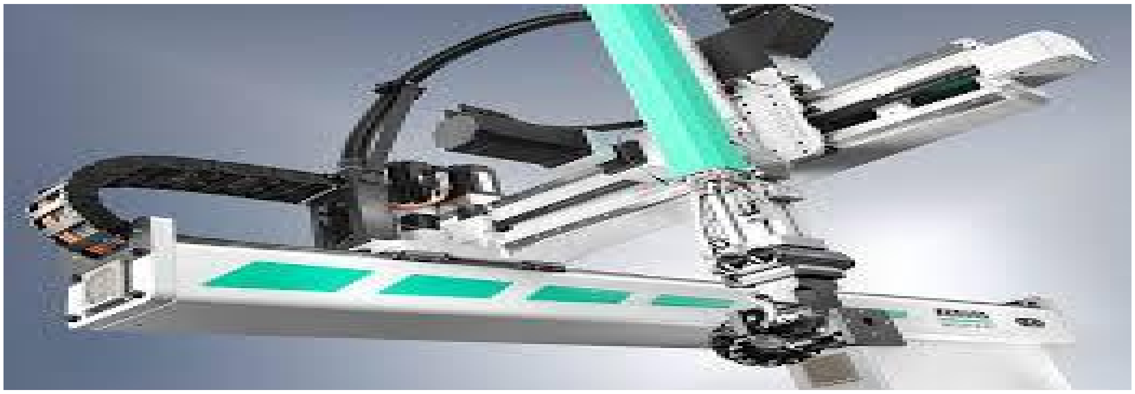

Figure2. Robotic system with latest technology amendments

A **multi-agent system** (**M.A.S.**) is a computerized system composed of multiple interacting intelligent agents within an environment. Multi-agent systems can be used to solve problems that are difficult or impossible for an individual agent or a monolithic system to solve. Intelligence may include some methodic, functional, procedural approach, algorithmic search or reinforcement learning [2]. Although there is considerable overlap, a multi-agent system is not always the same as an agent-based model (ABM). The goal of an ABM is to search for explanatory insight into the collective behavior of agents.

Figure3 Comparison of one robotic system with other robotic system

The terminology of ABM tends to be used more often in the sciences and MAS in engineering and technology [3]. Topics where multi-agent systems research may deliver an appropriate approach include online trading, disaster response, and modeling social structures. Modular self-reconfiguring robotic systems or self-reconfigurable modular robots are autonomous kinematics machines with variable morphology. Beyond conventional actuation, sensing and control typically found in fixed-morphology robots, self-reconfiguring robots are also able to deliberately change their own shape by rearranging the connectivity of their parts, in order to adapt to new circumstances, perform new tasks, or recover from damage. For example, a robot made of such components could assume a worm-like shape to move through a narrow pipe, reassemble into something with spider-like legs to cross uneven terrain, then form a third arbitrary object (like a ball or wheel that can spin itself) to move quickly over a fairly flat terrain; it can also be used for making "fixed" objects, such as walls, shelters, or buildings. In some cases this involves each module having 2 or more connectors for connecting several together. They can contain electronics, sensors, computer processors, memory, and power supplies; they can also contain actuators that are used for manipulating their location in the environment and in relation with each other. A feature found in some cases is the ability of the modules to automatically connect and disconnect themselves to and from each other, and to form into many objects or perform many tasks moving or manipulating the environment [4].

Conclusion

The roots of the concept of modular self-reconfigurable robots can be traced back to the “quick change” end effectors and automatic tool changers in computer numerical controlled machining centres in the 1970s. Here, special modules each with a common connection mechanism could be automatically swapped out on the end of a robotic arm. However, taking the basic concept of the common connection mechanism and applying it to the whole robot was introduced by Toshio Fukuda with the CEBOT in the late 1980s.

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