

Mechatronics Applications and Detecting Technological Convergence

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DESCRIPTION

Robots were created as a result of the fusion of numerous advanced technologies, including mechanical engineering, control systems, electronics, and software, and they have significantly contributed to the automation of the manufacturing sector. Unfortunately, their rate of adoption in the service industries, particularly the healthcare and medical industries, is far slower than anticipated. One of the factors promoting the entrance of robots in new industries, such as the medical and healthcare sectors, may be the convergence of technologies.

The general characteristics of technology convergence could be determined by these metrics, but additional in-depth investigations are needed to pinpoint the precise patterns and occurrences of this convergence. The goal is to first extract the patterns of technology convergence; then, to identify the processes of technology convergence more precisely than before by using a new methodology called "module-based mining methodology;" and finally, to look at the processes of technology convergence (TC) in the field of robotics. Recently, there has been an increased emphasis on TC. The majority of the items on the market today are related to developing industries, such as biotechnology, robotics, information and communication technology (ICT), nutraceuticals, and functional foods.

Robots are available in an array of designs and are employed for a wide variety of settings. Although they all have extremely different applications and forms, they all have three fundamental constructional parallels in common. All robots have some sort of mechanical construction, such as a frame, form, or shape that is intended to carry out a certain duty. For instance, a robot with caterpillar tracks might be used to move through mud or heavy dirt. The robot's mechanical design is mostly the creator's response to how to carry out the given duty and deal with the physics of its surroundings. A robot with caterpillar tracks, for instance, would require some sort of electricity to move the tracker treads.

Electricity, the source of that power, must pass through a wire and begin in a battery, completing a fundamental electrical circuit.

Even devices driven mostly by gasoline need an electric current to initiate the combustion process, thus the reason why the majority of gasoline-powered vehicles, including cars, contain batteries. Robots' electrical components are utilized for sensing, operation, and movement (*via* motors), which can sense things like heat, sound, position, and energy status (robots need some level of electrical energy provided to their motors and sensors to turn them on and carry out fundamental functions).

Applications

This kind of classification is becoming pertinent as more and more robots are created for certain activities. For example, even though many robots are designed for assembly work, they might not be readily adaptable to other usage. They are referred to as "assembly robots". For seam welding, several businesses offer integrated systems that include the robot, the welding apparatus, and other material handling instruments like turntables, etc. An integrated robotic system of this type is described as a "welding robot," despite the fact that its individual manipulator unit may be set up to do a variety of tasks. Heavy-duty robots are some robots that are made primarily for manipulating big loads.

Applications that are currently being developed include:

- Military robots.
- Robotics (collaborative robots).
- Decontaminating sites that have been contaminated by hazardous waste or nuclear power plants.
- Household robots.
- Nano robots.
- Robotic swarms.
- Drones with autonomy.
- Line markings on athletic fields.
- Robots for construction. The three groups into which construction robots can be separated are traditional robots, robotic arms, and robotic exoskeletons.
- Robotic tractors (AgRobots). Drone use and the concept of AI-assisted precision agriculture are closely tied to the use of robots in agriculture.

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