**ROBOT TECHNOLOGY AND ITS APPLICATIONS**

Robotics is a branch of science, engineering, and technology that develops devices known as robots that replicate or replace humans in various occupations. The development of robotics as it is used today has grown and expanded to include the creation, use, and development of bots that perform tasks in a variety of fields. Robot technology will play a significant role in positively improving human lives because robots have diverse uses in automotive, aerospace, and everyday life.

Robots are intelligent machines that can mimic or replace human beings in performing various activities. They have numerous applications in different areas like the automotive sector, aerospace industry, and daily life. The history of robotics can be traced back to 1921 when the term "robot" first appeared in a play by Karel Capek, but the first fully mobile and intelligent robot, Shakey, was invented by SRI International in the 1960s. The evolution of robots can be attributed to three technologies: sensors, actuators, and AI. Robots are used extensively in the automotive sector for industrial purposes like welding, assembly, paint spraying, quality check, and cleaning activities. They can be programmed to perform complex and repetitive tasks, eliminating the need for human intervention, and improving safety and dependability. Automotive robotics is the area that generates the largest incorporation of industrial robots worldwide. Currently, industrial robots and manipulators cover 30% of total investments in the industry sector. The use of autonomous robots across the whole manufacturing process enables significant process automation, and CNC machine tools and industrial robots are essential for automation in the production of passenger cars and vehicles for transportation. The applications of robotics in the automotive industry that we could point out are, Kuric (2019):

• increase process accuracy and annual production rates in the automotive industry,

• some tasks are automated and elaborated with limited human intervention,

• health is guaranteed, and possible occupational risks are reduced for workers

• effective activities and operations are generated for the handling of heavy and oversized materials.

Bartoš (2021) explains that automotive robotics has transformed the production processes in the automotive sector. Industrial robots are capable of modifying processes and motion trajectory instantly by updating the program, and they are flexible for a variety of uses. They have the capacity to move in three dimensions with sophisticated spatial motion. This ability allows for significant process automation and eliminates the need for human operators in repetitive tasks, thereby improving safety and dependability. Robots are also used for arc and spot welding, automated assembly, joint sealing, visual inspection, and quality check. Automotive industries are now using robots for new projects, such as the robotic tightening of screws on automobiles. This project involves building a robotic cell that will replace a human operator at the bolt-tightening station on the production line for car seats at a third-party auto industry supplier. The robot is supported by a base made of a welded steel frame that enables the robot's workspace to line up with the locations it needs to access given the location of the conveyor.

Apart from the automotive industry, robots have a significant impact on the aerospace industry. Robots are used in the manufacture of aircraft and spacecraft parts, assembly of aircraft, inspection, and maintenance. The use of robots in the aerospace industry helps to ensure precision and reliability in the production process. According to Lutovac et al. (2021), robots are being developed to carry out tasks such as satellite assembly, space debris removal, and maintenance of orbital infrastructures. The development of such robots is essential to increase the efficiency and effectiveness of space exploration activities.

ROBOTS X HUMANS

Robots are also becoming more common in daily life. They are used for tasks such as cleaning, delivery, and entertainment. For example, robotic vacuums like the Roomba have become popular for their convenience and efficiency in cleaning. Amazon has also been experimenting with delivery robots, which are used to deliver packages to customers' homes. Robots like Pepper and Nao are used for entertainment purposes and as receptionists in hotels and offices. The development of such robots is aimed at enhancing human-robot interaction and improving customer service.

The use of robots in different sectors has numerous benefits. One of the significant advantages is that robots can perform complex and repetitive tasks with precision and consistency, which reduces the chances of errors and defects. They also improve safety in hazardous environments, such as space and nuclear power plants, where human intervention is dangerous. Robots can work 24/7 without getting tired or needing breaks, which increases productivity and efficiency. The use of robots in manufacturing processes also reduces labor costs and allows for faster production cycles, which results in more profitability for the companies and total production cost.

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