**USES AND FUNCTIONS­**

The field of robotics has made remarkable progress in recent years through the emergence of Artificial Intelligence (AI), which revolutionized the capabilities of robots. By incorporating AI algorithms into their programming, robots can perform a wide range of task with great precision, accuracy, and autonomy. These tasks include working in collaboration with humans, performing challenging and high-level jobs, recognizing and sorting objects, processing vast volumes of data in real-time, and learning and adapting to new tasks and environments. Nowadays, robots become powerful tools because of their ability to think autonomously, achieved with the coexistence of AI and robotics. Artificial Intelligence (AI) is also employed in robotics through machine learning and edge computing. And there are multiple tasks incorporated to robots with the help of AI and machine learning involving computer vision, grasping the objects, navigation, motion control, real-world observation, and natural language processing.

Robots utilize Artificial Intelligence (AI) through machine learning, which enables them to learn and conduct specific jobs by observing and imitating human behavior. With AI, robots are equipped with computer vision to navigate, detect, and respond appropriately, allowing them to be more than just machines that perform repetitive tasks. They can now collaborate as cognitive partners with humans.

AI-based control systems and machine learning are also used in robotics to enable automation to grasp and manipulate objects, which has traditionally proven difficult for robots. Robots can grip and manipulate objects by analyzing visual input from camera and sensors using advanced algorithms, which allows them to comprehend the direction, orientation, characteristics, and forms of the items in their surroundings. With this knowledge, robots can plan and execute precise motions to control and grip the objects without human intervention.

Moreover, robots are more autonomous because of improved machine learning capabilities, eliminating the need for humans to organize and control process flows and navigation pathways. AI and machine learning assist robots in evaluating their environment, maintaining their balance, and directing their movements, allowing them to avoid obstacles. For instance, a robot with motion control could move through a congested warehouse, shifting its path when it comes across barrier or other moving objects.

For robots to operate with autonomy, they need to learn about their immediate environment. This comprehension is the result of natural process language and real-world observation. Machine learning has demonstrated an important potential for assisting computers in comprehending data and seeing patterns so they can take appropriate action. In addition, natural language processing allows robots to understand and interpret human language, including speech recognition. This skill is essential in applications where people must speak orally with the robot, like personal assistant robots. Hence, robots can understand spoken commands and reply accordingly by employing natural language processing algorithms, which improves their usefulness and usability.

Another way is employing AI in robotics through edge computing, where the information collected by robot-based sensors is examined in real-time near the machine, giving robots real-time awareness and the ability to respond quickly. The employment of many different sensors, including time-of-flight optical sensors, temperature and humidity sensors, ultrasonic sensors, vibration sensors, and millimeter-wave sensors, helps AI in assisting robots to learn and adapt. These sensors help robots become smarter and better able to behave and respond in various situations.

Therefore, AI has multiple uses in robotics, including accomplishing an array of tasks with high precision, accuracy, and autonomy with the aid of other disciplines, like machine learning and edge computing. Other activities incorporated into robots are computer vision, grasping objects, navigation, motion control, real-world observation, and natural language processing. Robots are getting more intelligent, accurate, and effective. And once humans realize the full potential of AI and robotic systems, they will advance further in the coming decades.

**References:**

<https://onlinedegrees.sandiego.edu/application-of-ai-in-robotics/>

<https://emeritus.org/in/learn/role-of-artificial-intelligence-and-machine-learning-in-robotics/#:~:text=Precise%20machine%20learning%20processes%20are,on%20unseen%20data%20and%20situations>.

<https://www.techtarget.com/searchenterpriseai/feature/Application-of-AI-in-robotics-boosts-enterprise-potential>