

Autonomous Robot Software Blog

For the past one and half a decade, the use of robotics for working autonomously, particularly within the industry, has been increased. They have been equipped with cameras that are used in place of eyes in order to help them search or to reach out somewhere to their destination. For instance, besides the “[Automated guided vehicles \(AGVs\)](#)” that are exploited to transport goods from one place to another within the warehouses, now drones and other flying robots are also used to respond to various tasks in a matter of seconds. Similarly, underwater robots are used to figure out and search the shipwrecks that might have plunged into the deep sea or oceans and seemed difficult to be found by humans. As the exploitation of robots has been recognized to be effectively incredible for the past few years, the above-mentioned examples might not signify the use of a self-governing robotic system in its true sense.

1 Imitating Learning Robots

In our company, we have designed and developed an [Artificial intelligence \(AI\) system software](#) that enables the robots to get the know-how of their environment through the AI learning process instigated inside the software. The software has been created in such a way that it is trained exclusively via computer simulations and these simulations are then deployed over the physical body of the robot. Thus, it learns from its environment and performs or imitates the tasks automatically once it is done.

2 Key Components and their Functions

Our autonomous robot system software comprises of three most crucial components, which are as follows:

2.1 Learning Insight

For a human being, learning insights mostly rely on five of the basic senses comprising of eyes, hair, skin, ears, and several other sensory organs that are used to distinguish and recognize the world.

In the same manner, robots always sense and have a perception of their environment via sensors. In our AI-designed robotic software, these sensors are “laser scanners and cameras” that work as eyes for the robots, “bumps sensors” work as hair and skin, “force-torque sensors” works as muscle

strain. All of these input devices are used to enable the robots' system to sense and perceive the surrounding environment.

2.2 Decision Making

In human, all of the decisions are made by the “brain”, in a similar manner, [autonomous robots](#) have “computers” in them that works as brain to the robots and makes the decision on the basis of the mission to be accomplished as well as the received information.

The AI system in our robots has been fed in such a way that they operate by taking permission from the safety system that is already instigated within the computer software (brain). Here, the embedded system plays a significant role that assists the robots to operate faster and decide to stop if any obstacle comes in their way.

2.3 Actuating Mechanism

The actuation mechanism works in the same way as muscles do to humans. This actuation mechanism enables the robots to perform various kinds of functions such as holding a cup of tea, cleaning the garden or piling up the blocks, etc.

3 Autonomous Robot Software Algorithm

In our autonomous robotic software, an algorithm for a “[one-shot imitating learning](#)” system has been developed that enables the human to tell how to perform the task by executing it in virtual reality (VR). The designed self-governing robotic system needs a single demonstration to imitate the task from the arbitrary initial configuration.

3.1 How it works

Our designed robots have the potential to mimic how humans control and regulate the robots, for instance, humans controlling the robots via teleoperations, autonomous mobile robots (AMRs), or other similar user interfaces. The developed AI mechanism can practice the sensory information comprising of making decisions, capturing images, and commanding the output movements to the robots in such a way that robots can perform their tasks autonomously.

4 Applications of AI Autonomous Robots Softwares

The Artificial intelligence (AI) based system within the robots is capable of handling industrial robotic arms, lawnmowers, delivery robots, and several other routine jobs.

4.1 Application in Logistics

Our AI autonomous robot software can be implemented in robots that are used for [material transportation](#). They are capable enough to transport the orders all across the warehouses and can provide the shipping facilities. Transportation being a labor-intensive task can be done by autonomous robot software freeing the human for other imperative tasks without disordering the workflows.

4.2 Application in Data Centers

Autonomous robot software can greatly help in several data center operations and research facilities. The robots via autonomous software are outfitted with several cabinets and lockboxes that safely transport the important material by following the protocol of “chain of custody” in a proper way enabling the accurate, and instantly available documentation of the whole process.

4.3 Application in Biotech and Healthcare

The market of [biomedicines and pharmaceuticals](#) is increasing exponentially particularly in these days of pandemics. For this purpose, Biotech and biomedical companies have to comply with strict regulatory processes, that need labor-intensive tasks. In order to accomplish these tasks, companies need [autonomous robots](#) that are capable of handling the significant processing inputs and can monitor the tasks in a safe manner while managing the waste removal from the production line. Our AI autonomous software programs can make the robots perform these tasks by focusing on the several critical steps that are required in [biotech manufacture processing](#).

4.4 Application in E-Commerce

Autonomous robot software can help regarding several e-commerce applications, like moving carts to the other mobile and desktop manipulations, etc. As the autonomous software can be programmed in multiple tasks, their flexibility makes the robots ideal for numerous kinds of applications, even these [autonomous robots](#) can be programmed to sort the data and information. Our AI-based autonomous robot software makes the robots perform the following tasks:

- Order completion
- Material transportation
- Data sorting
- Return handling
- Inventory management

- Parcel Arrangement

Our autonomous robot software makes the robot perform all of the above-mentioned applications and tasks with at least one camera. Furthermore, Auxiliary sensors within the robots are employed in such a way that they assist in reducing the demonstration required by the robots.

5 References

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