

Innovative Applications of Robotic Arms with Integrated Software and Hardware in 2023

Here are 5 excellent application cases about Robotic Arms with Integrated Software and Hardware we select to share.

SHENZHEN, GUANGDONG, CHINA, April 13, 2023 /EINPresswire.com/ -- With the rapid development of technology, collaborative robots are becoming increasingly popular in the fields of research and education. At the same time, there are also more and more integrated high-tech software and hardware available. To explore more possibilities, many users, including individual makers, research experts, and educators, are trying to combine robotic arms with different integrated hardware and software to achieve more applications.

Here are the excellent application cases we select to share.

Achieve voice control on [robotic arm](#) [1]

[Elephant Robotics](#) has been

continuously upgrading its products with software improvements, enabling its robotic arms to have wireless control functions such as remote control, smartphone control, and gamepad control. This brings more convenience to users while also providing user-friendliness for beginners.

An individual maker was inspired by the scene in Iron Man where Tony Stark interacts with his robotic arm using voice commands. As a result, he decided to develop the voice control function



for his own robotic arm. By connecting a voice development board to the [myCobot](#) 280 robotic arm and performing a series of operations such as signal processing, environmental programming, and command implantation, he successfully developed an application that allows the robotic arm to perform corresponding movements through voice commands. For example, when the user says:"Hi myCobot.", and robotic arm will reply:"Hi, can I help you?", then the robotic arm will follow the voice commands to finish the movement.



Achieve conveyor control in an industrial simulation [2]

Undoubtedly, collaborative six-axis robotic arms are the best tools for learning industrial robot knowledge. Many universities purchase collaborative robotic arms, such as myCobot and mechArm, to provide students in industrial and robotics majors with learning and practical opportunities. In order to make collaborative robotic arms work in a more sophisticated simulated industrial environment, and enable students to learn more about industrial assembly lines, a professor used myCobot 280 with an Arduino development board, M5Stack Basic Core, and a set of simulated industrial conveyor belts to create a simulated industrial assembly line kit. With this kit, users can learn various aspects of knowledge, including understanding, adjusting, and obtaining the electrical, mechanical, and parameter information of the robotic arm, as well as the process of industrial transportation.

Operate myCobot with the spatial recognition of D455 [3]

An advanced technology department in Japan is currently researching multi-modal reinforcement learning, exploring the combination of camera images and tactile sensors. In order to achieve the so-called "Sim2Real", the department is applying the results of reinforcement learning from simulators to the mechanical arms and cameras of actual robots. To this end, researchers tested myCobot 280 and the RealSense D455 depth camera in the ROS environment. In the test, users learned to apply the reinforcement learning model learned from the simulator to the mechanical arm, improving their experience in robot development and data processing capabilities. This research is expected to promote the development of the robotics field and lay the foundation for achieving more intelligent robot applications.

ChatGPT for robotics [4]

In 2023, ChatGPT, a natural language processing model based on artificial intelligence, is widely popular around the world. Using deep learning technology and trained on a large amount of text data, it can be applied to various fields, such as customer service, education, healthcare, finance, and more, bringing a lot of convenience to different industries. A research team from Microsoft

published a research report discussing how ChatGPT can be applied to robots, using myCobot 280 as a case study. In the case study, they used ChatGPT to control the robotic arm and complete the drawing process of the Microsoft logo. This has led more users to discover the possibility of integrating artificial intelligence with robotic arms and to explore the development and implementation of more applications.

Reinforcement learning with Isaac Gym [5]

When attempting to use robots for deep reinforcement learning, preparing large amounts of training data on physical machines is a very difficult challenge. Therefore, a research scientist in the technology department conducted an experiment: combining a robotic arm with a simulator to achieve the learning ability of the robotic arm using only Python code. The user used myCobot 280 with Isaac Gym to conduct this experiment. Isaac Gym is a physics simulation environment developed by Nvidia for reinforcement learning, and through this simulation environment, collecting a large dataset becomes an easy task. The availability of benchmark testing environments makes it easy to compare and verify new learning algorithms, which is a significant advantage for researchers and analysts with different professional backgrounds.

The Elephant Robotics team is constantly collecting user-shared cases and suggestions to improve the performance of their robotic arms while developing more complementary kits to provide different solutions for education, healthcare, agriculture, commerce, and other fields. The company is also committed to the development and sharing of individual development and educational robots, providing equipment and software adaptations to better support robotics in the future.

Reference

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