

CONTROL OF THE GRABBER ROBOT BASED ON THE ARDUINO MICROPROCESSOR

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The continuous development of technology makes all technological specialists continuously develop their skills and qualifications. Robotic technologies are actively being implemented in industrial (robotic arms in car factories) and medical (da Vinci Xi surgical robot) fields, as well as in everyday life (robotic vacuum cleaners). The application of these mechanisms can be extensive, and work in this area is full of potential.

This work aims to get acquainted with the arm robot of "The Fischertechnik" company and further programming it for subsequent operation. A mini-version of an industrial robot manipulator, known as an "arm", was used in this work. It is mounted on a base and designed to perform monotonous tasks.

"The Grabber" is a robotic arm from the "Fischertechnik" that is capable of performing operations such as identification, gripping, and sorting of objects. In addition, "The Grabber" can be used to perform various tasks in automating production processes. The controllers from the "Fischertechnik" are prominent microcontrollers in the market compared to their competitors. However, there are other microcontrollers, such as Arduino, which is a popular option for learning how to program microcontrollers. Arduino is a simple microcontroller board with analog and digital inputs and outputs, which operates on 5V. This microcontroller can be controlled in its own programming environment, such as the Arduino IDE, which will be used to control the robot. "The Grabber" consists of various elements, including sensors, mechanical parts, actuators, electronic control, and software. The development of software for Arduino may vary depending on the type of control used, such as the first type of control using a potentiometer. The essence of this method is that we enter the desired potentiometer values in the data input line, separating them with commas. The robot will move to the corresponding values with the appropriate tolerance when the program is launched. This form of control is not very practical because it is difficult to move to specific positions using these values. Therefore, a better option is to use Cartesian coordinates for control. This type of control is provided in the Arduino IDE, where there is a «go-to» function, in which three coordinates x, y, and z can be entered. After entering the data, the arm will move to the specified point in its coordinate system. This allows for more precise and

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efficient control of the arm. In addition, to improve the efficiency and accuracy of "The Grabber," extra sensors such as cameras or distance sensors can be used. For example, installing a camera allows the robot to determine the location of objects on the work surface and automatically perform gripping and sorting operations.

In conclusion, based on the above, we can confidently assert that this field of activity is promising worldwide, so we must implement the study and use of robotics in our educational process. As a result of the conducted analysis, the structure and operating principle of the arm-robot have been identified, which allows for its further implementation into operation with controller programming.

R e f e r e n c e

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