

ROBOTIC HAND

Prepared by: Woo Jia Jun

ABSTRACT

This project is essentially a low-cost robotic arm with four degree of freedom that is able to be controlled through computer interface by the user. The robotic arm's structure, bending and movement is built by imitating that of a human's arm, it is capable of performing simple tasks such as holding and picking up objects within certain sizes. With further development and improvement, the robotic arm can be used in handling hazardous and dangerous tasks, such as those involving high-temperature or corrosive substances. The project is separated into two main parts, which is the hardware and software part.

Hardware part: robotic arm structure, base station circuit & parallel port

Software part: VB interface & PIC coding

The hardware part consists of a main controller PIC16F877A circuit whose function is to receive signal from parallel port and send signals to move servo motors. Those servo motors are 180° servo motors and the robotic arm's locomotion system is initiated by four servo motors. The four axis of the robotic arm includes the gripper, elbow, shoulder and base station.

The software part, MikroC is used as high level programming language to write programs for the PIC16F877A microcontroller. Meanwhile, a computer interface is built using Visual Basic 6.0, a user-friendly graphical user interface(GUI) to make controlling the movement of robotic arm simple and easy by just clicking on command buttons and scroll bars on the computer screen. Instructions given to the computer interface are then sent to the controller circuit via parallel port.

Conceptual knowledge learnt previously was put into full use in the process of constructing the project. Although many complications were faced, most of them were successfully solved. These may prove to be useful in the future.