

RETRIEVING ROBOT

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ABSTRACT

This report will show the construction and working of the "Retrieving Robot". The meaning of retrieving robot in the project is, develop a wireless robot that can identify the materials and shape of object, pick it and bring it back to the instructor.

Technically, the implementation of this project uses quite a number of sensors. The medium range infrared sensor is used to avoid the robot from bumping and hitting into obstacle. Installation of the long analog distance sensor is to search of the box which could be in a range 1.5 meters away from the starting point. When the robot moves to the items collection point (a box), it randomly picked up the item, turn back, put the item on the force sensor to sense its weight. If the robot cannot find the box, it will rotate at that point until the box is placed there. If the item is listed as the programmed item; then the robot will grasp it and bring back to original point. However, if the item is not on the programmed list, then robot will drop the item at the side. The process is then repeated again.

In order to program the robot to identify the item, PIC microcontroller is used. In this project, PIC16F876A microcontroller and wireless circuit has been used to instruct and control the robot motion. Other sensors such as medium range infrared sensor, long analog distance sensor and force sensor also used and integrated into the system. The wireless circuit used is a RF 433MHz transceiver circuit. There are few buttons to press at the transmitter. When the button is pressed, RF 433MHz signal will send to the receiver. At the receiver, RF 433MHz receiver will identify the transmit signal then instruct the microcontroller to move the DC motor in clockwise direction. At this moment the long analog distance sensor will detect of the box. Once the box is found, the robot moves forward until it reaches the box. When the front medium range infrared sensor is activated, the DC motor stops running and hence stops moving the robot. After 1 second, the servo motor at the first arm is activated then followed by second arm so that object can be picked up. After this, the robot grasps, turned back and measures the weight of that object. The microcontroller makes decision based on the signal send from the force sensor, if the signal is equal to programmed signal, then robot will hold the object, and microcontroller activate the servo motor turn to 180° and activate the DC motor again so that robot can return back to origin point or stating point.

To the end of the report, the objectives of the project has not only can be achieved but most importantly, I gain the knowledge and skill needed to be applied to complete this project.