

# ROBOT TO NAVIGATE BETWEEN MOVEABLE OBJECTS

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## ABSTRACT

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The aim of the project is to build an autonomous robot that moves from point A to point B. the robot has to detect the obstacle in its path and lift the obstacle, or push this obstacle from its path. After this is done, the robot has to place the object (obstacle) back to its original position. O the robot is unable to lift or push the object, then it has to bypass the object.

The brain of this project is the Peripheral Interface Controller (PIC). PIC16F877A is used in this project. The PIC is programmed using mikroC. Five infrared (IR) sensors are fixed on the vehicle. The purpose of these IR sensors is to detect any obstacle in the path of the robot. The 5 UR sensors are connected to pins RC0, RC1, RC2, RC3, RC4, RC5 and RC6 of the preprogrammed PIC16F877A. These pins are normally high (+5V). When the sensors detect an obstacle, the pins go to low (0V) that stops the show motor thereby stopping the car.

If only the IR sensor in middle detects an obstacle, relays controlling the DC motor of the claw turn on and the robot will grab the obstacle. After tit has been grabbed, the 2 relays controlling the DC motor of lift-up lever turn on and lift the object with the help of gears. When the object is lifted up to the maximum height which is programmed in the PIC, the lift-up lever stops. At this point a checking is done by the middle sensor to confirm whether the object has been lifted up or not. If the sensor detects any object still, it means the object s not lifted and it is heavy. In this case, the claw grabs the object and pushes 180° anticlockwise with the help of a servo motor. On the other hand, if the object is successfully lifted up, the servo motor turns on and rotates the object 180° anticlockwise. Then the car moves 22cm forward and keeps the object back into its original position by opening the claw. After this, claw and lift-up lever go back into its initial position and robot continues to move forward. If all sensors detect an obstacle in the same time, the robot by-passes the object through its left side. After approximately 5m, the robot stops with the help of a magnetic switch.

The major objectives and aims have been achieved. The sensor performed its function with no hassle. Besides that, the arm was also able to lift up the obstacle that is at a certain weight. In addition to this, there are moments when the vehicle does not respond appropriately.

**Keywords:** PIC, IR sensors, mikroC, DC motor, servo motor, relays, magnetic switch.