Development of an Autonomous Robot with better Sensing and Accuracy by using an 8051 Microcontroller

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Abstract

This research paper reports a unique autonomous robot design with reduced blind spot areas. The new robot is not only cost-effective but also has improved sensing and accuracy capabilities. The design and fabrication of the new autonomous robot involved the use of the following hardware components: servo motors, infrared or ultrasonic sensors, and a microcontroller. The developmental work involved the design of the line follower and obstacle avoidance robot system using two pairs of line follower circuits and five (5) ultrasonic sensors circuits, including some supporting circuits. The better solution for the line follower and obstacle avoidance functions are provided by using four (4) pairs of LEDs for the receiver, line dependent resistor (LDR) for the line tracking sensor, and five (5) ultrasonic sensors to detect the obstacles. A mechanical structure and motor placement for the electronic device has been fabricated that can perform functions of sensing the obstacle and avoiding it. An 8051 microcontroller has been programmed to control the robot's movement and to respond accurately to the sensor.

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