FINAL YEAR PROJECT REPORT

Robo-Cleaner

Project Advisor

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Robo-Cleaner

Project Report submitted to the
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Abstract

Cleanliness is certainly one of the biggest and crucial aspects of our day to day lives. The demand of automatic cleaning in industries and houses is increasing day by day. Automation improves quality as well as saves time. Hence, it was decided to design and build an automatic vacuum cleaner that will help to clean the floor of the room automatically. It also has the capability of avoiding obstacles that come in its path. Robo-Cleaner can clean the floor as well as carpet of a room and is capable to detect and avoid the hurdles. It is microcontroller based machine which provides the input for processing. Sensors have been used for the detection purpose. This project is helpful for household purposes as well as for industrial applications. The main goal of this project is to provide comfort and saving of time. Romba the Vacuum cleaner available in market is much expensive and difficult to buy for consumers. In this project we have tried to make an inexpensive and affordable vacuum cleaner robot.

Dedication

To our respected parents whose utmost love, care and struggle against all odds brought us to this height of knowledge with the blessings and help of the

ALLAH ALMIGHTY

Acknowledgement

First of all, we are grateful to ALMIGHTY ALLAH who gave us the strength to achieve our goals. Without HIS divine help, we could do nothing. Secondly, we would like to pay deep regard to our parents because their selfless and extreme love, were always there to give us the required motivation, courage and confidence to complete our tasks. We would like to salute them because of their patience in managing with our busy routines and tight schedules.

We truly acknowledge the cooperation and help provided by our project advisor Mr.Khan Nazir. He has been a constant source of guidance throughout the course of this project. We would also like to thank lab attendants who provided us with all the equipment during project making.

Special thanks to Muhammad Yousaf, Abdullah Yousaf and Mustajab Ali

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List of Abbreviations

MCU …… Micro Controller Unit

Tx …… IR Transmitter

Rx …… IR Receiver

LED …… Light Emitting Diode

IC …… Integrated Circuit

PWM …… Pulse Width Modulation

DC …… Direct Current

IR …… Infrared

PCB …… Printed Circuit Board

PIC …… Peripheral Interface Controller

Chapter 1

Introduction

Robotics is the branch of technology that deals with the design, construction, operation, structural disposition, manufacture and application of robots. Robotics is related to the sciences of electronics, engineering, mechanics, and software. We were inspired by "Vacuum Cleaner Robot" the very great invention of science so we decided to make a small such robot. Our Robo-Cleaner can clean the floor as well as carpet of a room and is capable to detect and avoid the hurdles. This project is helpful for household purposes as well as for industrial applications. The main goal of this project is to provide comfort and saving of time.

1.1 General Block Diagram:

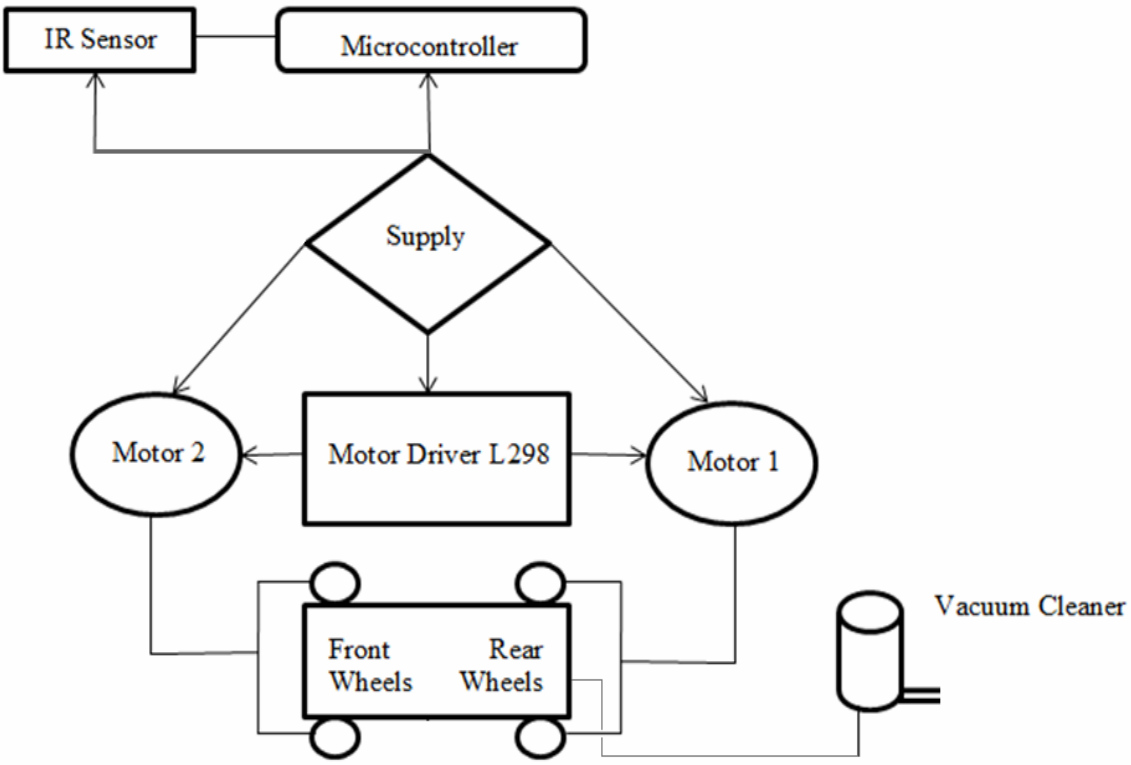

Fig.1.1 General Block Diagram of whole project

This is the general block diagram of our whole project. We have used PIC16f877A microcontroller for automation (Automatic movement of robot) and it will work as brain, which will take input from the IR Sensor and drive the motors as fed into the brain through

coding. Transmitter receiver LED pair is used as the IR sensor to detect obstacles. We have used two batteries, 12V and 5V, as the motors required 12V, and all other ICs operate on 5V. Voltage regulator LM7805 is used for conversion of voltage. Motor driver L298 is used for the bi-directional movement of motors. Vacuum cleaner is attached at the back of the robotic car to clean the floor.

Chapter 2 is about experiments and methods for implementation. How we got the idea of this project, and what changes were required as we preceded our work and searched components in the market.

In chapter 3, a brief description of major components is described, like DC Motor, IR Sensor and Vacuum Cleaner. And also the division of tasks, how we managed to do our project in steps, as our advisor guided us.

In chapter 4, there is a summary of our project, the difficulties we faced during implementation, and the future possibilities through which we can further improve the working of our project.

At the end there are appendices of schematic diagram, hardware implementation, cost of project, software implementation, and datasheets.

1.2 Motivation:

Since the beginning of our degree, the Final Project was the most talked about event of the entire 4 years. It was supposed to be the culmination of our learning, the highlight of the program; the chance to demonstrate our knowledge, problem solving skills, and ability to perform under the pressure of deadlines. In short, we were supposed to show that we had evolved into engineers.

Our earliest motivation was just excitement at the prospect of being given the responsibility of doing a big project. As it was decided that we would work on robot, so we started to watch you tube videos, read from internet web sites and books related to robotics. In this project, we use number of concepts that we studied in our 4 year degree program like Circuits, Electronics, Digital Logic Design, Signals and System, Machines and Power Electronics, Microcontrollers and many more.

As our final year and the inevitable project loomed ever closer, we started consulting teachers as regards to our project advisor. We were immediately pointed in the direction of Mr.Khan Nazir, who was a dedicated instructor. He readily accepted, and from that day one he became our guide and mentor.