

FINAL YEAR PROJECT REPORT

GSM GUIDED ROBOTIC ARM WITH OBJECT HANDLER



Submitted by

SOHAIB SIDDIQUI

101519-129

USMAN ARSHED

101519-184

NAVEED GHAFAR

101519-213

DEPARTMENT OF ELECTRICAL ENGINEERING

SCHOOL OF ENGINEERING

UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

SEPTEMBER 2014

ACKNOWLEDGEMENTS

First of all we would like to thank Allah Almighty who gave us the strength and power to do everything. Who gave us knowledge and wisdom and helped us in each difficulty and problem. He gave us the awareness to choose the right path to do something for mankind. This project is the result of a long period of hard work and support of many individuals who helped us time to time to achieve this goal. We would like to thank all of them for everything they have done for us. On the top of the list we would like to thank our parents who work from dawn to dusk for our comfort, who made everything available for us. They supported us both, morally and financially, had faith in us, believed in us, persuaded us and appreciated us on our accomplishments. Without them it was impossible for us to achieve anything. We cannot return even the smallest amount of that they gave us. In our lives they are truly a blessing of Allah.

We would like to thank our mentors and counselors. It is all because of their support and hard work for we are standing on a position in a society where we can distinguish ourselves from others. We would like to thank our honorable **Project Advisor: Mr. TABRAIZ ALVI** for his assistance and inspiring attitude during the course of our project. They were the one who were there to guide us and familiarize us with all new concepts. They helped us in fulfillment of this project by all true means. We would like to thank our Project Advisor for his extreme cooperation and encouraging attitude during this project.

Last but not the least we would like to thank all the individuals who helped us to accomplish the ultimate goal.

Table of Contents

Chapter1:Introduction	09
1.1 Problem Statement	10
1.2 Objectives	10
Chapter 2: Theoretical Background and Review of Literature	11
2.1 Development in History	11
2.2 GSM	14
2.3 DTMF	16
2.4 Types Of Motors	18
Chapter 3: Details of Theoretical Design	21
3.1 DC Motors	23
3.2 Voltage Regulator	25
3.3 Servo Motor	27
Chapter 4: Practical Implementation	29
4.1 DTMF circuit	29
4.2 IRF540	30
4.3 4n25	30
4.4 Controller	31
Chapter 5: Component Selection and Bill of Material	33
Chapter 6: Testing and Evaluation	34
6.1 Test for Mechanical Arm	36
6.2 Test for Motors	39

6.3 Test for Signal with DTMF	42
6.4 Test for Servo	45
Chapter 7: Results and Error Analysis	48
7.1 Driver circuit	48
7.2 Circuit for Mechanical hand	48
7.3 Motors Controlling Circuit for Robot	48
Chapter 8: Difficulties Faced	49
8.1 Regarding Chassis	49
8.2 DTMF Circuit	49
8.3 Difficulties in Programming	50
Chapter 9: Manufacturability, Usability and Sustainability	51
9.1 Manufacturability	51
9.2 Usability	51
9.3 Sustainability	51
Chapter 10: Future Development	52
Chapter 11: Societal Issues	53
11.1 Ethical	53
11.2 Social	53
11.3 Economical	54
Chapter 12: Conclusions and Recommendations	55
Chapter 13: Reference	56
13.1 Website Reference	56

13.2 Text Book Reference

56

Chapter 14: Explanation of Code

57

ABSTRACT

The main theme of this project is to design a robotic arm which can move up and down and lift objects from one place to another. It is a car moving robot that can move in any direction.

The project is part of embedded system design. Embedded systems are such systems which are controlled by one or more processing cores which makes the use of PIC microcontroller which is programmed by embedded C instructions and use to interface other sensor modules.

Our project is entirely driven by wireless technology and is divided into two circuits.

- 1) Transmitter Circuit
- 2) Receiver Circuit

Mobile phones transmit certain frequencies when their buttons are pressed our project is operating on same principal, which in turn move our robot in different directions. Our specially designed robotic arm mounted on top of robot has wide range of applications.

Usually Radio Frequency (RF) circuits are used for wireless controlled robots which have limited frequency, limited range and limited control. To avoid these limitations and constraints, the use of mobile phone for the robot control is the best option. It provides the advantage of unlimited range of controlling the robot.

Key Notes: GSM, MICROCONTROLLER, MOTORS, MECHANICAL ARM