**Robot Navigation using Optical Odometry**

Submitted in partial fulfilment of the requirements

of the degree of

**Bachelor of Engineering**

by

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**2014-15**



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# CERTIFICATE

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**Project Report Approval**

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**Declaration**

We declare that this written submission for B.E project entitled “Robot Navigation Using Optical Odometry” represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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**ABSTRACT**

The objective of the project is to design a robot which uses optical odometry for navigation and distance calculation in a given a fixed working environment. Optical odometry is one in which the distance travelled is measured by optical means. Optical mouse consists of a single LED (Light Emitting Diode) which it bounces the light off the surface. It can determine how far the mouse has moved across your desk and at what speed. Coordinates are then sent to the host. The collected displacement data is initially sent to an Arduino microprocessor, which in turn sends this data to a Graphical User Interface for onward transmission.

The report includes the following chapters:

Chapter 1 introduces the system by giving its general description and the motivation for designing the system. It also includes the problem definition, and the basic outline of the project.

Chapter 2 describes the existing systems and their shortcomings. The chapter also describes the measures taken to provide an alternate solution for the users.

Chapter 3 details the feasibility of the system on various accounts like technical, operational, economic, and schedule feasibility. The chapter also describes the functional and non-functional requirements of the system. The hardware and software requirements are also mentioned.

Chapter 4 lists and describes the components of the system, such as the Atmel 89C51 microcontroller, IR sensor for obstacle detection, IR sensor for path following, the relay system, and the DC motors used in the system. Integration of the components with each other is also described. Diagrams such as the sequence diagram, collaboration diagram, activity diagram, data flow diagram are included for the better understanding of the system.

Chapter 5 includes the implementation details of the system. The algorithm and flow-chart of the working of the system is included in this chapter.

Chapter 6 deals with the testing of the system. The testing of the tools and equipment is described. The different test cases are also mentioned in the chapter.

Chapter 7 mentions the planning and scheduling of the project. The timeline or Gnatt chart is included, as well as the distribution of work among the project members.

Chapter 8 brings an end to the report by including the conclusion and future scope of the system. The future scope of the system includes adding various components to the system such as RFID, speech recognition, Buzzer, and color sensors.

**CONTENTS**

i Approval Sheet

ii Declaration of Academic Honesty and Integrity

iii Abstract

iv Contents

vi List of Figures

vii List of Tables

Chapter 1: Introduction.....................................................................................................................1

* 1. Project Overview..................................................................................................................1
  2. Motivation of the project......................................................................................................1
  3. Problem Definition...............................................................................................................2
  4. Outline of the project............................................................................................................2

Chapter 2: Literature Survey .............................................................................................................4

2.1 Study of existing system........................................................................................................4

2.2 Proposed system ...................................................................................................................6

Chapter 3: Project Analysis .............................................................................................................10

3.1 Feasibility Analysis ............................................................................................................10

3.1.1 Technical Feasibility..................................................................................................11

3.1.2 Operational Feasibility...............................................................................................11

3.1.3 Economic Feasibility..................................................................................................11

3.1.4 Schedule Feasibility...................................................................................................12

3.2 Requirement Analysis..........................................................................................................12

3.3.1 Functional Requirements...........................................................................................12

3.3.2 Non-Functional Requirements...................................................................................13

3.3 Hardware and Software Requirements................................................................................14

Chapter 4: Hardware and Software Architecture.............................................................................16

4.1 System Architecture.............................................................................................................16

4.1.1 Atmega 328p microcontroller....................................................................................17

4.1.2 PS/2 Connector.................................................................................................22

4.1.3 IR Optical Mouse (A2639B)......................................................................................25

4.1.4 DC motors..............................................................................................................27

4.2 Circuit connections..............................................................................................................33

4.2.1 Microcontroller to relay system...........................................................................33

4.2.2 Microcontroller to line sensor..............................................................................34

4.2.3 Microcontroller to obstacle detector sensor.........................................................34

4.2.4 Microcontroller to keypad...................................................................................34

4.3 Diagrams..............................................................................................................................35

4.3.1 Sequence Diagram.....................................................................................................35

4.3.2 Activity Diagram...............................................................................................36

4.3.3 Data Flow Diagram..................................................................................................37

Chapter 5: Implementation Details.................................................................................................41

5.1 Algorithm.............................................................................................................................41

5.2 Flowchart.............................................................................................................................43

5.3 Entire system.......................................................................................................................45

Chapter 6: Testing..........................................................................................................................47

6.1 Hardware Testing.................................................................................................................48

6.1.1 Tools....................................................................................................................48

6.1.2 Equipment............................................................................................................49

6.2 Test Cases............................................................................................................................49

6.2.1 Module Testing....................................................................................................49

6.2.2 Integration Testing...............................................................................................50

Chapter 7: Project Planning and Scheduling..................................................................................51

7.1 Timeline Chart..............................................................................................................51

7.2 Work Distribution Table...............................................................................................52

Chapter 8: Conclusion and Future Work........................................................................................53

8.1 Conclusion...........................................................................................................................53

8.2 Future Work.........................................................................................................................53

APPENDIX......................................................................................................................................55

References

Acknowledgements

**LIST OF FIGURES:-**

|  |  |  |
| --- | --- | --- |
| **Figure** | **Name** | **Page Number** |
| Figure 2.1 | The Scarab lunar rover | 4 |
| Figure 2.2 | optical sensor used on Scarab | 5 |
| Figure 2.3 | Surveyor's wheel | 17 |
| Figure 2.4 | Trundle Wheel | 19 |
| Figure 4.1 | Atmega328p microcontroller | 22 |
| Figure 4.2 | Pin Diagram of Atmega328p | 23 |
| Figure 4.3 | PS\2 Connector | 24 |
| Figure 4.4 | Pin Diagram of A2639B | 25 |
| Fig. 4.5 | The SDIP 12 PIN Package for USB/PS2 All-In-One Mouse A2639B | 25 |
| Figure 4.6 | DC motor | 26 |
| Figure 4.9 (a) | Reflection of light in IR sensors | 27 |
| Figure 4.9 (b) | Schematic diagram for IR sensor | 27 |
| Figure 4.10 | Structure of electromechanical relay | 28 |
| Figure 4.11 | 4 channel relay system | 31 |
| Figure 4.12 | DC motor | 31 |
| Figure 4.13 | Circuit Connections | 33 |
| Figure 4.14 | Sequence diagram | 35 |
| Figure 4.15 | Collaboration diagram | 36 |
| Figure 4.16 | Activity Diagram | 37 |
| Figure 4.17 | Level 0 DFD | 38 |
| Figure 4.18 | Level 1 DFD | 39 |
| Figure 4.19 | Level 2 DFD | 40 |
| Figure 5.1 | Flowchart | 44 |
| Figure 5.2 | Top view of robot | 45 |
| Figure 5.3 | Bottom view of robot | 46 |
| Figure 5.4 | Front view of robot | 46 |
| Figure 7.1 | Timeline chart | 51 |

**LIST OF TABLES:-**

|  |  |  |
| --- | --- | --- |
| **Table** | **Name** | **Page Number** |
| Table 2.1 | Navigation | 7 |
| Table 3.1 | Hardware Requirement Table | 14 |
| Table 3.2 | Software Requirement Table | 15 |
| Table 4.1 | Pin Description of AT89C51 | 19 |
| Table 4.2 | Special features provided by Port 3 pins | 22 |
| Table 4.3 | Pin description of IR sensor for obstacle detection | 23 |
| Table 4.4 | Pin description of IR sensor for path following | 26 |
| Table 6.1 | Test cases for module testing | 49 |
| Table 6.2 | Test cases for integration testing | 50 |
| Table 7.1 | Work Distribution Table | 52 |