Mini Projects

Mini project is an activity of a group of students with the intention to work on a specific Topic of common interest which will give an experience of problem –solving along with group members, by using knowledge, facilities available and under the guidance of a faculty. Within a group, one may work on different components of work, or all may work on each activity related work.

Mini projects helps students in different way like the formation of groups, understanding group behavior, improving communication skills, learning in –depth with minimum time, interaction with the guides and outside agencies.

Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students.

As per the guidelines of visvesaraya Technological University, institution is assessing the Mini Projects for Third year students.

PRINCIPAL
SHRIDEVI INSTITUTE OF
ENGINEERING AND TECHNOLOGY
TUMKUR - 572106.

	(h) Seminar: Deliverable at the Institution under the supervision of a Faculty. **(i)** Internship: Preferably at an industry/R and D organization/IT company/Government organization or elsewhere of significant repute for a specified period as mentioned in Scheme of Teaching and Examinations. **(j)** Mandatory Courses (MC): These Courses are mandatory, without the benefit of a grade or credit, for students admitted to B.E./B.Tech. Programme. A pass in each mandatory Course is required to qualify for the award of degree.
18OB3.2	The minimum number of students registered to any Elective Course offered by the Departments shall be not less than ten. However, the above condition shall not be applicable to Programmes having class strength of less than 10. In such cases, only one elective course shall be offered.
18OB3.3	A student shall exercise his option in respect of Elective Course/s and registered for the same at the beginning of the concerned semester. The student may be permitted to opt for a change of Elective Course/s within 15 days from the date of commencement of the semester as per the calendar of the University.
18OB3.4	**Course Registration:** In order to maintain proper academic record of each student at the Institution, every student shall register for the Courses of a semester (Credits) under the supervision of a Faculty Advisor (also called Mentor, Counselor, etc.,) in each semester.
18OB4.0	**Internship/Professional Practice**
18OB4.1	Internship / Professional Practice The Internship shall be completed during the period specified in the Scheme of Teaching and Examinations. **1)** The internship shall preferably be at an industry/R and D organization/IT company/ Government organization of significant repute for a specified period as mentioned in Scheme of Teaching and Examinations. **2)** The Department/college shall nominate staff member/s to facilitate, Guide and supervise students under internship. **3)** The students shall report progress of the internship to the Guide in regular intervals and seek his/her advice. The Guide shall maintain the progress record of the candidates undergoing internship. **4)** After the completion of Internship, students shall submit a report with completion certificate and attendance certificate to the Head of the Department with the approval of both internal and external Guides. **5)** There shall be 40 marks for CIE and 60 marks for SEE. The minimum requirement of CIE marks shall be 50% of the maximum marks. **6)** The internal Guide shall be the internal examiner for the SEE. **7)** The external Guide for Internship shall be the external examiner for SEE. Examination for internship shall be conducted at the college and the date shall be fixed in consultation with the external Guide. The Examiners shall jointly award the SEE marks. [To be read along with 18OB8.9 (f)] **8)** In case the external Guide expresses his inability to conduct the Examination, the Principal /Chief Superintendent of the Institute shall appoint a senior faculty of the Department to conduct the Examination along with the internal Guide. **9)** Non-availability of Internal guide due to inevitable situations for the conduct of SEE, the Principal /Chief Superintendent of respective institute shall appoint a senior faculty of the Department to conduct the Examination. **10)** The students are permitted to carry out the internship anywhere in India or abroad. The University will not provide any kind of financial assistance to any student for carrying out the Internship.
18OB 5.0	**Technical Seminar and Project**
18OB 5.1	**Technical Seminar:** Technical Seminar is one of the head of passing. **(i)** Each candidate shall deliver Technical seminar as per the Scheme of Teaching and Examinations on the topic chosen from the relevant field. **(ii)** The Head of the Department shall make arrangements for the conduct of seminars

	(c) For Practical/ Mini-project/Internship/Project work– Phase 2 the maximum CIE marks shall be 40. To appear for the SEE, the minimum CIE marks to be secured shall be 50 % of the maximum marks i.e., 20 marks. **(d)** For all other theory Courses of the Programme, the maximum CIE marks shall be 40. To appear for the SEE, the minimum CIE marks to be secured shall be 40 % of the maximum marks i.e., 16 marks. **(f)** For Additional Mathematics I and II (to be completed by diploma lateral entry students) the maximum CIE marks shall be 40. To appear for the SEE, the minimum CIE marks to be secured shall be 40 % of the maximum marks i.e., 16 marks. **(g)** For Engineering Graphics and Elements of Civil Engineering and Mechanics (of First Year Engineering and to be completed by B.Sc graduates under lateral entry) the maximum CIE marks shall be 40. To appear for the SEE, the minimum CIE marks to be secured shall be respectively 50 % and 40 % of the maximum marks i.e., 20 and 16 marks.
18OB8.2	**Continuous Internal Evaluation Procedure:** [To be read along with 18 OB 8.1and 8.3] **(a) Theory Courses:** **(i)** CIE Marks in each theory Course [including 'Technical English I and II', 'Constitution of India, Professional Ethics and, Cyber Law', 'Environmental Studies', 'Additional Mathematics I and II'], shall be the sum of marks prescribed for tests and assignments. Marks prescribed for tests shall be 30 and that for assignments 10. **(ii)** The CIE marks awarded for tests in the theory Courses shall be based on three tests generally conducted at the end of fifth, tenth and fifteenth week of each semester. Each test shall be conducted for a maximum of 50 marks and the final test marks shall be the average of three tests, proportionately reduced to a maximum of 30 marks. **(iii)** The remaining 10 marks shall be awarded based on the evaluation of assignments/unit tests/written quizzes that support to cover both lower and higher order thinking skills as per Revised Bloom's Taxonomy. **(iv)** Final CIE marks awarded shall be the sum of 18OB8.2 (a) (ii) and (iii) for a maximum of 40 marks. **(v)** The candidates shall write the tests, assignments/unit-tests /written quizzes in Blue Books which shall be preserved by the Principal/ Head of the Department for at least six months after the announcement of University results and shall be made available for verification at the direction of the Registrar (Evaluation). **(b) Engineering Graphics/ Drawing/Field work Courses:** The CIE marks awarded for I year Engineering Graphics Course shall be based on **(i)** Classwork for 24 marks (sketching and Computer Aided Engineering Drawing). **(ii)** Two Tests conducted in the same pattern as that of SEE for 16 marks (The marks secured can be taken as best of the two tests). **(iii)** Final CIE marks awarded for Engineering Graphics shall be the sum of 18OB8.2 (b) (i) and (ii) for a maximum of 40 marks. **(iv)** The CIE marks awarded for higher semester Drawings/ Design Drawings offered by various branches shall be based on the evaluation of the sheets and one test in the ratio 60:40. **(v)** The CIE marks awarded for field work (like Surveying Practice) shall be based on the evaluation of the associated field work and one test in the ratio 60:40. **(c) Practical Courses:** The CIE marks awarded in case of Practical shall be based on the weekly evaluation of laboratory journals/ reports after the conduction of every experiment and one practical test in the ratio 60:40. **(d) Internship:** The CIE marks awarded for internship shall be based on the evaluation of Internship Report, Presentation skill and Question and Answer session in the ratio 50:25:25. **(e) Technical Seminar:** The CIE marks awarded for Technical Seminar shall be based on the evaluation of Seminar Report, Presentation skill and Question and Answer session in the ratio 50:25:25. **(f) Mini – Project:**

REGISTRAR
Visvesvaraya Technological University
BELAGAVI - 590 018.

	The CIE marks awarded for Mini - Project, shall be based on the evaluation of Mini - Project Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.The marks awarded for Mini - Project report shall be the same for all the batch mates. **(g) Main Project Work:** **(i)** Project Work Phase – 1 The CIE marks awarded for project work phase -1 shall be based on the evaluation of project work phase -1 Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.The marks awarded for the Project report shall be the same for all the batch mates. **(ii)** Project Work Phase - 2 The CIE marks awarded for project work phase -2 shall be based on the evaluation of project work phase -2 Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.The marks awarded for Project report shall be the same for all the batch mates.
	(h) Vyavaharika Kannada (Balake Kannada)/Aadalitha Kannada (Samskruthika **Kannada)** **(i)** CIE Marks in Vyavaharika Kannada (Balake Kannada)/Aadalitha Kannada (Samskruthika Kannada) shall be the sum of marks prescribed for tests and assignments. Marks prescribed for tests shall be 75 and that for the assignments shall be 25. **(ii)**The CIE marks awarded for the tests shall be based on three tests generally conducted at the end of fifth, tenth and fifteenth week of each semester. Each test shall be conducted for a maximum of 25 marks and the final CIE marks shall be the sum of the marks of all the three tests. **(iii)** The remaining 25 marks shall be awarded based on the evaluation of assignments/oral discussions/ quizzes that supports communication skills. **(iv)** Final marks awarded shall be the sum of 18OB8.2 (h) (ii) and (iii) for a maximum of 100 marks. **(v)** Students shall write the tests in Blue Books and complete the exercises/activates/ questions given in the University Kannada textbook. These shall be preserved by the Principal/ Head of the Department for at least six months after the announcement of University results and shall be made available for verification at the direction of the Registrar (Evaluation).
18OB8.3	**(a)** The CIE marks in the case of Internship/Technical Seminar/Mini-Project and Project Work Phase 1 and 2 shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. **(b)** A committee constituted by the Head of the Department of Humanities and Social Science shall inspect and authenticate the award the CIE marks for the Course Vyavaharika Kannada (Balake Kannada)/Aadalitha Kannada (Samskruthika Kannada). The committee shall consist of two senior faculty members of the Department and the senior most acting as the Chairperson.
18OB8.4	**(i)** Students satisfying the attendance requirement but failing to secure the minimum percentage of CIE marks, in any Course/s, shall not be eligible for the SEE conducted by the University and they shall be considered as fail in that Course /those Courses. However, they can appear for University examinations conducted in other Courses of the same semester and backlog Course/s if any. **(ii)** Students who have satisfied the attendance requirement but not the CIE requirements shall be permitted to register afresh and appear for SEE after satisfying the CIE requirements in the same Course/s (with or without satisfying the attendance requirement) when offered during subsequent semester/s. **(iii)** Each appearance to SEE to complete a course shall be treated as an attempt.
18OB8.5	CIE marks of those students, who come under 18OB8.4, shall also be sent to the Registrar (Evaluation) along with other course CIE Marks.

SHRIDEVI EDUCATION

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(An ISO 9001-2008 Certified Institution)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

ACADEMIC YEAR 2021-22

6th Semester Mini Project Details

Sl.no.	Group	Student Name	USN	Project title
1	1	AKASH DODAMANI.	1SV19EC001	Rain sensing wiper.
2		AKHILESH YADAV.	1SV19EC002	Rain sensing wiper.
3	2	ARBIYA SULTANA.	1SV19EC003	war field robot
4		SANIYA FATHIMA.	1SV19EC027	war field robot
5	3	BHAVANA. U.	1SV19EC005	forest security monitoring
6		NALINA. D. K.	1SV19EC019	forest security monitoring
7	4	BHOOMIKA. D.	1SV19EC006	automatic water tap control
8		CHANDAN. M. U.	1SV19EC007	automatic water tap control
9	5	DARSHAN. M. MANCHIKOPPAD	1SV19EC009	smart waste bin
10		ARUN. N. R.	1SV18EC003	smart waste bin
11	6	Divya pol		wheel chair
12		PREKSHA NAYAK	1SV19EC033	wheel chair
13	7	GAGANA. V.	1SV19EC011	blind stick
14		HARSHITHA. M.	1SV19EC013	blind stick
15	8	GOWRAMMA. S.	1SV19EC012	solar tracking
16		LOKESHWARI KOTI. B. S.	1SV19EC016	solar tracking
17	9	CRISPINA VIOLET. P.	1SV19EC008	automatic street light
18		SHARANA KUMAR.	1SV19EC028	automatic street light
19	10	K. SANJAY.	1SV19EC015	person counter
20		REHAMAN KHAN. H. K.	1SV19EC023	person counter
21	11	MEGHANA. R.	1SV19EC017	automatic gate control in railways
22		SUPRIYA. N.	1SV19EC029	automatic gate control in railways
23	12	MUSKAN ZAHID.	1SV19EC018	alcohol sensing and eng lock
24		Bindu T S	1SV20EC400	alcohol sensing and eng lock
25	13	PREETHIKA. A. S.	1SV19EC021	smart room temperature controller
26		PRIYADARSHINI. M.	1SV19EC022	smart room temperature controller
27	14	SAHIL SALAM.	1SV19EC025	line following robot

28		Bhavani shankar	1SV19EC032	line following robot
29	15	Lavanya	**1SV20EC402**	smart shopping trolley
30		Ganashree	**1SV20EC401**	smart shopping trolley
31	16	K. S. SANTHOSH.	1SV19EC014	traffic signal control
32		ANIKET ASHOK NEJE	1SV18EC001	traffic signal control
33	17	KARTHIK. S.	1SV19EC024	Vehicle Battery charger
34		YOGISH. K.	1SV19EC031	Vehicle Battery charger
35	18	Yashwanth C	1SV19EC030	home automation

MINI PROJECT COORDINATOR

HOD

HOD
Dept of E&C
SIET, Tumkur-6

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
"JNANA SANGAMA", BELGAVI-590018 KARNATAKA

Mini Project Report (18ECMP68)

ON

"Smart Blind Stick"

Submitted in partial fulfillment of the requirement for the award of degree

BACHELOR OF ENGINEERING

IN

ELECTRONICS & COMMUNICATION ENGINEERING

Submitted by:

GAGANA V (USN: 1SV19EC011)

HARSHITHA M (USN: 1SV19EC013)

Under the Guidance of:

Mr.Raghavendra D.B.E., M.Tech
Assistant Professor, Dept of ECE.,SIET
Tumkuru

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Recognized by govt. of Karnataka, Affiliated to VTU, Belagavi and approved by AICTE,New Delhi)

Sira Road, Tumkur-572106

2021– 2022

SHRIDEVI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Recognized by govt. of Karnataka, Affiliated to VTU, Belagavi and approved by AICTE, New Delhi)
Sira Road, Tumkur-572106, Karnataka
2021-2022

SHRIDEVI EDUCATION

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Certificate

This is to Certified that the mini project work (18ECMP68) entitled "SMART BLIND STICK" has been Successfully carried out by **GAGANA V(USN: 1SV19EC011) ,HARSHITHA M (USN: 1SV19EC013),** a bonafide students of **Shridevi Institute of Engineering and Technology, Tumkur- 572106,** in partial fulfillment for the award of **Bachelor Of Engineering in Electronics & Communication Engineering** of the **Vishvesvaraya Technological University, Jnana Sangama, Belagavi -590018,** during the academic year 2021–2022. It is certified that all corrections/suggestions indicated for internal assessments have been incorporated in the report. The mini project report has been approved as it satisfies the academic requirement with respect to the mini project work prescribed for the said Bachelor Of Engineering degree.

..... 26/7/2022	27/7/2022	.....
Signature of the guide	Signature of the HOD	Signature of the principal
Prof. Ragavendra D **Assistant professor** **Dept. of ECE., SIET** **Tumakuru**	**Prof. Aijaz Ahamed Sharief** **HOD** **Dept. of ECE., SIET** **Tumakuru**	**Dr. Narendra Viswanath** **Principal** **SIET, Tumakuru**

EXTERNAL VIVA

Name of examiners:

1. Raghavendra D
2. Dr. Pradeep K.G.M

Signature with date:

..... 28/7/2022
.....
28/07/2022

Declaration

We are GAGANA V (USN: 1SV19EC011) ,HARSHITHA M (USN: 1SV19EC013), student of VI Semester, **Bachelor Of Engineering in Electronics & Communication Engineering at Shridevi institute of Engineering and Technology, Tumakuru, Karnataka,** hereby declare that, this Mini Project work titled **" SMART BLIND STICK"** is an original and bonafide work carried by us at S.I.E.T Tumkuru, in partial fulfillment of **Bachelor Of Engineering** by the **Visvesvaraya Technological University,Belagavi-590018 during the academic year 2021-22.**

We also declare that, to the best of our Knowledge and belief, the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion by any student.

Date: 26/04/2022
Place: Tumkur

GAGANA V
(USN: 1SV19EC011)

HARSHITHA M
(USN: 1SV19EC013)

ACKNOWLEDGEMENT

Words are not enough to express our deep sense of gratitude, reverence and indebtedness to a number of persons whose contributions have made this mini project work successful.

We feel self-honored to place our warm salutation to the **Authorities of Shridevi Charitable Trust (R.),** Sira Road, Tumakuru-572106.

And to our Department of Electronic & Communication Engineering, **Shridevi Institute of Engineering and Technology, Tumakuru,** which give us the opportunity to obtain a strong base in **Bachelor Of Engineering** and profound knowledge**.**

We are highly grateful to **Dr. Narendra viswanath,** Principal, SIET, Tumakuru for encouragement of this work.

We are grateful to **Prof. Aijaz Ahamed Sharief**, HOD Dept. of ECE, S.I.E.T, and Tumakuru for his concern about our work and constructive suggestions.

We are take this opportunity to express our deep sense of gratitude to our guide, **Mr. RAGHAVENDRA D,** Asst. Professor, Dept. of ECE, S.I.E.T, Tumakuru for his/her keen interest and invaluable help throughout the course of this work and also in shaping our profession.

We would like to thank all the teaching and non-teaching staff of SIET, Tumakuru for their kind co-operation during the course of the work. The support provided by the college and departmental library is greatly acknowledged.

Finally, We are thankful to my parents and also my friends, who helped us in one way or the other throughout our work.

GAGANA V
(USN: 1SV19EC011)

HARSHITHA M
(USN: 1SV19EC013)

ABSTRACT

Blind person finds it difficult to detect the presence of any obstacles in their way while moving from one place to another and it is very difficult to find the exact location of the stick if it have been misplaced. Thus, the smart stick comes as a proposed solution to help the visually impaired people in their day to day living without the help of others. In this project we proposed a solution for the blind people by using an ultrasonic sensor in the blind stick. The instrument stands used to perceive the obstacles at the range of four meters and infrared instrument is castoff to perceive the nearer complications in front of the blind people. Thus the vibration motor helps the user to know there is some object in front, right and left of the smart stick. This proposed method uses the Arduino UNO as controller. The branch is accomplished of sensing all difficulties in front of the user. The smart stick is of user friendly, quick response, very low power consumption, lighter weight and it is easy to hold and fold by the user. The Smart stick also sends a message to the user if the stick is fallen from the user hands with the help of ADXL335

LIST OF FIGURES

LIST OF TABLES

CONTENTS

Chapter : 1

INTRODUCTION

in real Blindness is a very common disability among the people throughout the globe. About 90% of the world's populations which are visually impaired live in developing countries. They need help to walk and do their essential work of daily life. Smart Blind Stick is a fully automated as well as manually operated, easy to maintain, cheap and comfortable to use device. It is an innovative device designed for visually disabled people for refined navigation and advanced obstacle detection. In this device, we propose advanced blind stick that allows visually challenged people to navigate with relieve using advanced technology. The blind stick is integrated with three ultrasonic sensors, panic switch, navigation switch, and Bluetooth and soil moisture detector along with Arduino UNO. \

Visually impaired persons have difficulty to interact and feel their environment. They have little contact with surroundings. Physical movement is a challenge for visually impaired persons, because it can become tricky to distinguish obstacles appearing in front of them, and they are not able to move from one place to another.

They depend on their families for mobility and financial support. Their mobility opposes them from interacting with people and social activities. in the past, different systems are designed with limitations without a solid understanding of the nonvisual perception. Researchers have spent the decades to develop an intelligent and smart stick to assist and alert visually impaired persons from obstacles and give information about their location. Over the last decades, research has been conducted for new devices to design a good and reliable system for visually impaired persons to detect obstacles and warn them at danger places.

The three ultrasonic sensors are used to detect obstacles ahead using ultrasonic waves. The technologies used for the device include embedded C language for programming and coding, Atmega328 microcontroller is used which is a low power microcontroller

GSM (Global System for Mobile Communication) for SMS communication, It is not an effortless task for a blind person to use this device with complete accuracy as it requires a necessary training to help the user understand the information and to react to them time.

1.1 OBJECTIVE

The main objective of this project is to design a smart walking stick that alerts visually impaired people over obstacles and water in front could help them in walking with less accident. It outlines a better navigational tool for the visually impaired. It consists of a simple walking stick equipped with sensors to give information about the environment. The user can choose the location from the set of destinations stored in the memory and will lead in the correct direction of the stick.

1.2 MOTIVATION

The mobility of blind people in unknown environment seems impossible without external help, because they don't have any proper idea about their surroundings. So, we are developing a smart walking stick which helps them to know about their surroundings and also guide them during travelling.

1.3 PROBLEM STATEMENT

1. Blind people finding of way through a complex environment.
2. The orientation and navigation for these people in unknown environment seems possible.
3. Blind peoples are fearless or comfortable about independent mobility or travel.

1.4 SOLUTION TO THE PROBLEM

The Blind Walking Stick has been finally made into prototype that can be used to guide the blind. It aims to solve the problems faced by the blind people in their daily life. The system also takes the measure to ensure their safety. This project will help all the blind people in the world and will make it easier for them to walk. It was done to help the blind move ahead very well. It helps to facilitate the movement ensuring safety

Chapter : 2

LITERATURE SURVEY

The reference paper by the authors Arnesh Sen , Kaustaubh Sen and Jayoti Das –from "Institute of Electrical and Electronics Engineers" Ultrasonic Blind Stick for completely Blind people To avoid any kind of Obstacles of 2018 proposes a smart stick that is intended and executed to aid blind persons so that they can walk independently without much difficulty knee above obstacle detection and avoidance system is implemented by using and extra ultrasonic sensor on the highest of the stick with turn an alarm and vibration ON when there's a person, obstacle or wall at a distance of fifty cm ahead to avoid an accident and thus helping the person to maneuver independently. This proposed system apparatus a new technique for supporting blind people by means of the ultrasonic sensors and a global positioning system modem. The system will make available the obstacles hindrance feature and avoiding vehicle dash to the blind people. Another learning on the paper by Manisha Bansode, Shivani Jadhav and Angela Kashyap from "International Conference on Advanced Computing and Communication" of 2020 analyzes the troubles of blind people who face many difficulties to interact with their nearby surrounding. The aim of this paper is to supply a tool which can help blind people to navigate also as sense the obstacles. We decide to propose a working model which is Walking persist with in-built ultrasonic sensor with a microcontroller system. The Android application also shows the situation of the blind man to his loved one. In this way, blind man is guided to maneuver along the trail by his loved one via the Android Mobile Application. This paper aims to style a man-made navigating system with adjustable sensitivity with the assistance of ultrasonic proximity sensor and a GPS module to help these blind men. It also consists an Android Application that guides the user and his family about the current location

CHAPER:3

DESIGN AND IMPLEMENTATION

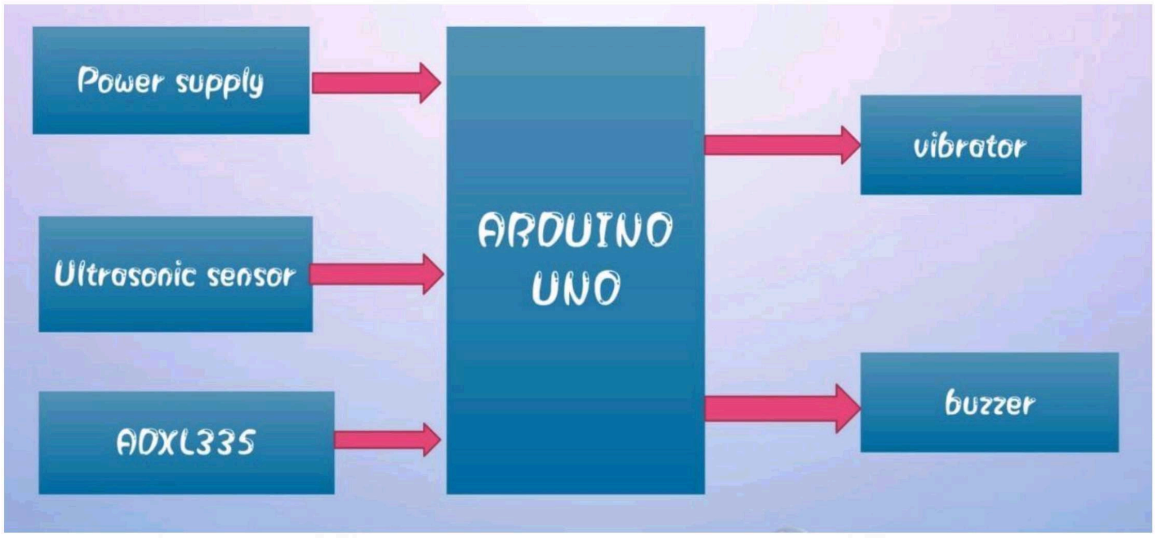


FIG3.1:BLOCK DIAGRAM

Block diagram are illustrations consisting of several blocks connected by arrows or lines,the connectors are used to show the relationship between the neighbouring blocks.these diagrams give a better overview and explanation of the complex components of a system.here power supply.ultrasonic sensor.adxl335 are used as input components which are connected to the ardino uno board.ardino uno is an microcontroller board based on the microchip ATMEGA328P microcontroller and developed by Arduino uno.cc.the board is equipped with sets of digital and analog i/o pins that may be interfaced to various expansion boards and other ckts.vibrator and buzzer are referred to output components

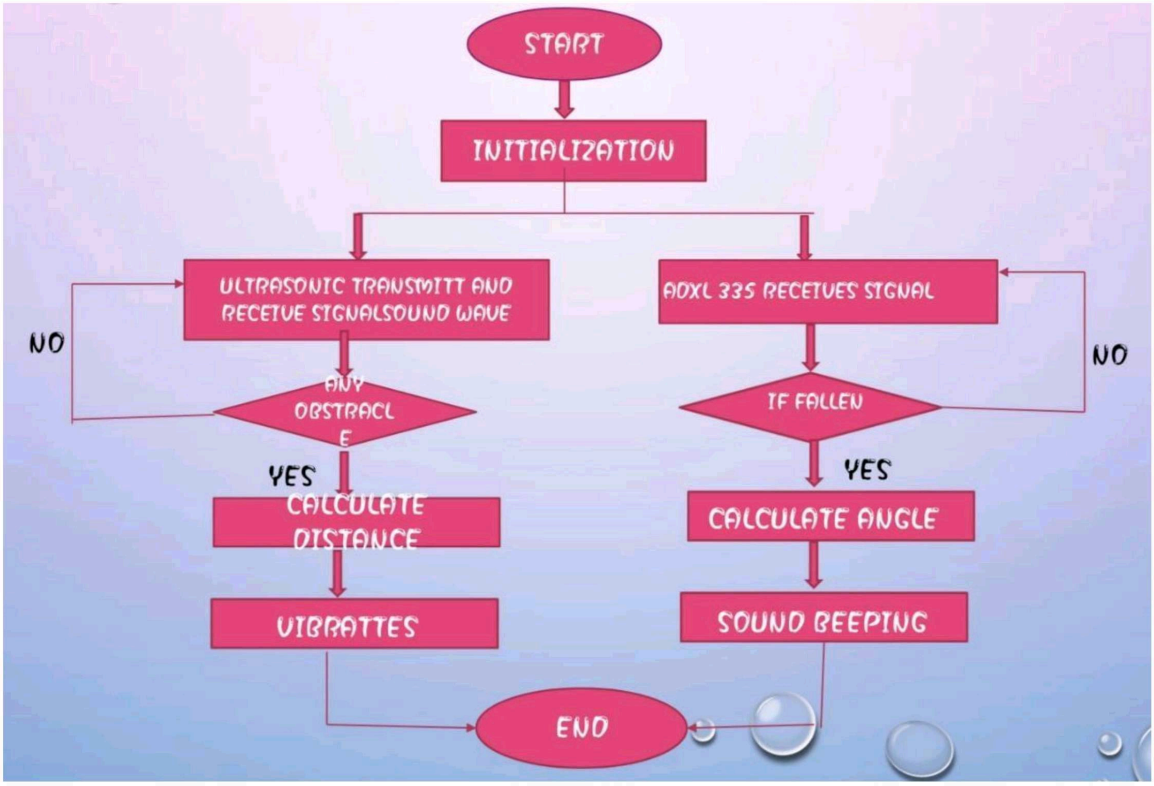


FIG3.2:FLOW CHART

- Fig above represent the flow chart of smart blind stick
- As shown first we will initiliase the components
- When we look at ultrasonic sensor.it will transmit and receives the signal.if there is any obstscle found then it will calculate distance if distance is less than 1m vibration moter starts vibrating
- In adxl 335 it will only receive the signal.whenever the stick tilts it will calculate the angle if the angle is more than 15 degree then it will send the message to the buzzer .then buzzer starts beeping

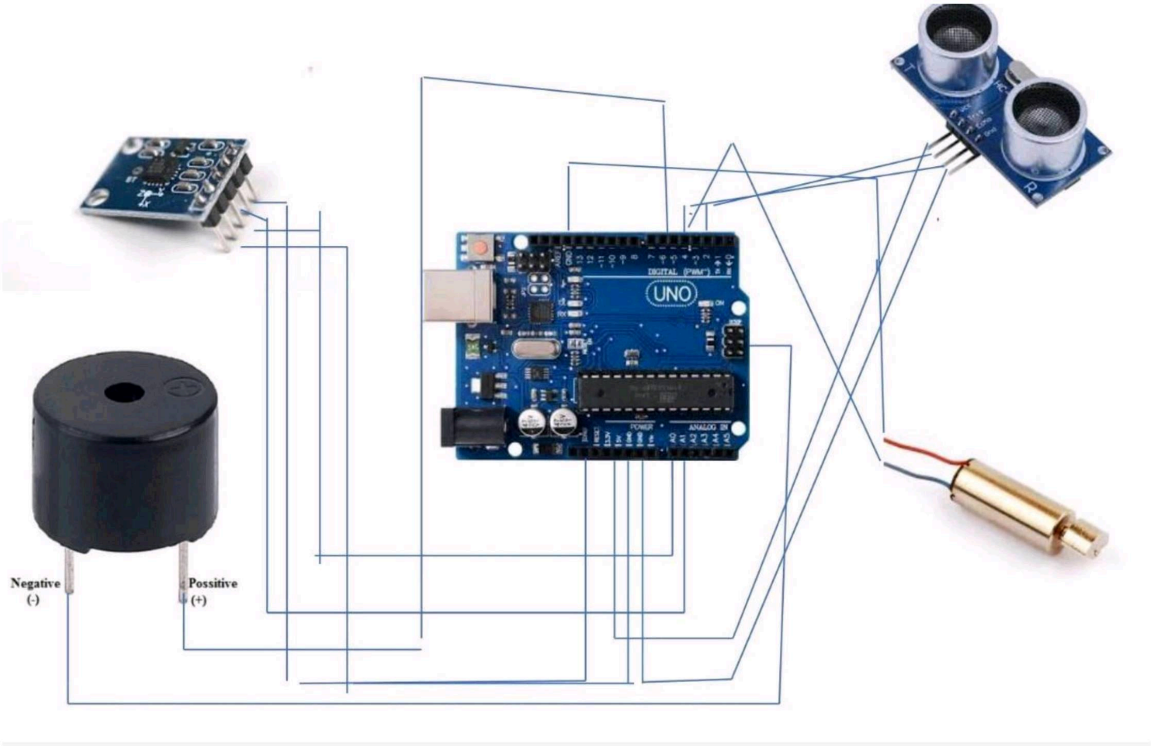


FIG3.3 :CIRCUIT DIAGRAM

- Above fig represents the circuit diagram of smart blind stick
- Ultrasonic sensor contains echo.trigger.vcc and ground pins where all pins of ultrasonic sensor are connected to digital pins of Arduino uno i.e echo is connected to pin3.trig is connected to pin2.vcc is connected to 5v.grnd is connected to grnd
- Buzzer contains positive and negative pins which are connected to digital pins of Arduino uno i.e positive for pin5 and negative for ground
- Vibration motor contains positive and negative pins which are also connected for Arduino uno i.e positive for pin4 and negative for ground
- ADXL335 contains x.y..z.grnd and vcc.here we are used only x.y pins which are connected to analog pins of Arduino i.e x is A0 and y is A1.vcc for 5v and grnd to grnd

Chapter : 4

HARDWARE REQUIREMENTS

- power supply
- Arduino UNo
- Ultrasonic sensor
- Vibrator
- ADXL
- Buzzer

HARDWARE COMPONENTS EXPLANATION

4.1 ARDUINO UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some version of the hardware are available

The word "uno" means "one" in Italian and was chosen to mark the initial release of Arduino Software. The Uno board is the first in a series of USB-based Arduino boards; it and version 1.0 of the Arduino IDE were the reference versions of Arduino, which have now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware

Fig4.1:ardino uno

While the Uno communicates using the original STK500 protocol, it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

4.1.1 TECHNICAL SPECIFICATION

• Microcontroller: Microchip ATmega328P.

• Operating Voltage: 5 Volts.

• Input Voltage: 7 to 20 Volts.

• Digital I/O Pins: 14 (of which 6 can provide PWM output).

• UART: 1.

• I2C: 1.

• SPPI: 1.

• Analog Input Pins: 6.

• DC Current per I/O Pin: 20 Ma.

• DC Current for 3.3V Pin: 50 mA.

• Flash Memory: 32 KB of which 0.5 KB used by bootloader.

• SRAM: 2 KB. • EEPROM: 1 KB.

• Clock Speed: 16 MHz.

• Length: 68.6 mm.

• Width: 53.4 mm.

• Weight: 25 g.

4.1.2 GENERAL PIN FUNCTION

• LED: There is a built-in LED driven by digital pin 13. When the pin is high value, the LED is on, when the pin is low, it is off.

• VIN: The input voltage to the Arduino/Genuino board when it is using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.

• 5V: This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 20V), the USB connector (5V), or the VIN pin of the board (7-20V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage the board.

• 3V3: A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.

• GND: Ground pins.

• IOREF: This pin on the Arduino/Genuino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source, or enable voltage translators on the outputs to work with the 5V or 3.3V.

• Reset: Typically used to add a reset button to shields that block the one on the board

4.1.3 SPECIAL PIN FUNCTION

Each of the 14 digital pins and 6 analog pins on the Uno can be used as an input or output, under software control (using pinMode(), digitalWrite(), and digitalRead() functions). They operate at 5 volts. Each pin can provide or receive 20 mA as the recommended operating condition and has an internal pull-up resistor (disconnected by default) of 20-50K ohm. A maximum of 40mA must not be exceeded on any I/O pin to avoid permanent damage to the microcontroller. The Uno has 6 analog inputs, labeled A0 through A5; each provides 10 bits of resolution (i.e. 1024 different values). By default, they measure from ground to 5 volts, though it is possible to change the upper end of the range using the AREF pin and the analogReference() function.

In addition, some pins have specialized functions:

• Serial / UART: pins 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USBto-TTL serial chip.

• External interrupts: pins 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value.

• PWM (pulse-width modulation): pins 3, 5, 6, 9, 10, and 11. Can provide 8-bit PWM output with the analogWrite() function.

• SPI (Serial Peripheral Interface): pins 10 (SS), 11 (MOSI), 12 (MISO), and 13 (SCK). These pins support SPI communication using the SPI library.

• TWI (two-wire interface) / I²C: pin SDA (A4) and pin SCL (A5). Support TWI communication using the Wire library.

• AREF (analog reference): Reference voltage for the analog inputs.[7]

4.1.4 COMMUNICATION

The Arduino/Genuino Uno has a number of facilities for communicating with a computer, another Arduino/Genuino board, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An

ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The 16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a .inf file is required. Arduino Software (IDE) includes a serial monitor which allows simple textual data to be sent to and from the board. The RX and TX LEDs on the board will 16 flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A SoftwareSerial library allows serial communication on any of the Uno's digital pins.

4.1.5 AUTOMATIC (SOFTWARE) RESET

Rather than requiring a physical press of the reset button before an upload, the Arduino/Genuino Uno board is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 nanofarad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip.

This setup has other implications. When the Uno is connected to a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following halfsecond or so, the bootloader is running on the Uno. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened.

4.2 POWER SUPPLY

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load. As a result, power supplies are sometimes referred to as electric power converters. Some power supplies are separate standalone pieces of equipment, while others are built into the load appliances that they power.

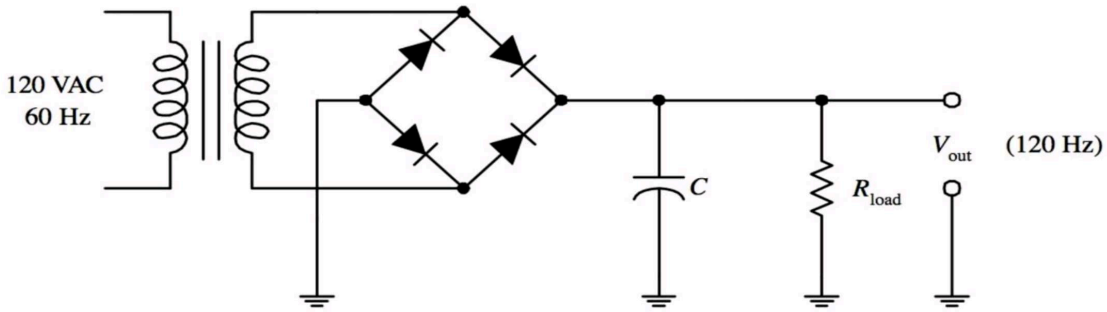


FIG 4.2 : CIRCUIT DIAGRAM OF POWER SUPPLY

All power supplies have a power input connection, which receives energy in the form of electric current from a source, and one or more power output connections that deliver current to the load. The source power may come from the electric power grid, such as an electrical outlet, energy storage devices such as batteries or fuel cells. The power supply which we are using consists of transformers which reduces alternating current to required voltage coming with the flow of power supply after reduction of voltage then we use a full wave bridge rectifier to convert AC to DC and then the DC current obtained is fed to the filters and then to the required voltage regulator and the to a load, the output of this power supply is obtained from the load and given to the components and the microcontroller. The function of a linear voltage regulator is to convert a varying DC voltage to a constant, often specific, lower DC voltage. In addition, they often provide a current limiting function to protect the power supply and load from overcurrent (excessive, potentially destructive current). A constant output voltage is required in many power supply applications, but the voltage provided by many energy sources will vary with changes in load impedance. Furthermore, when an unregulated DC power supply is the energy source, its

output voltage will also vary with changing input voltage. To circumvent this, some power supplies use a linear voltage regulator to maintain the output voltage at a steady value, independent of fluctuations in input voltage and load impedance. Linear regulators can also reduce the magnitude of ripple and noise on the output voltage.

4.3ACCELEROMETER

Acceleration is a process in which velocity is changed with respect to time and it is a vector quantity. Similarly, velocity is a speed and direction. There are two ways for explaining acceleration of anything first one is change in speed and second one is change in direction. Sometimes both are changed simultaneously. If we talk about ADXL 335 accelerometer, then this accelerometer is a device that is used for measuring acceleration of any object. It measures the acceleration in the form of analog inputs, in three dimension direction such as X,Y and Z. It is low noise and less power consume device. When it is used for acceleration measure purposes then it is interfaced with any

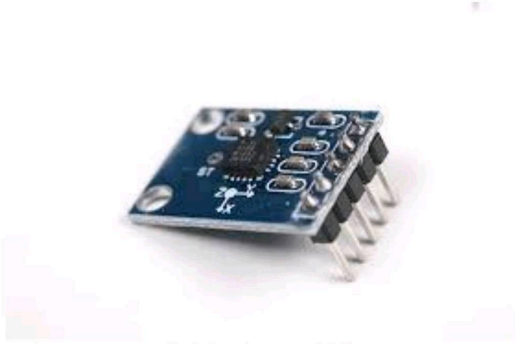


FIG 4.3 : ADXL 335

type of controller such as microcontroller or Arduino etc. It is mostly used in construction working machines such as drilling ,driving piles and demolition etc., human activities machines such running, walking, dancing and skipping etc. It is easily available in market or online shop. A simple ADXL 335 accelerometer is shown below

4.3.1 PIN CONFIGURE OF ADXL 335 ACCELEROMETER

Every ADXL 335 accelerometer consists of five pins which are used for different purposes.

NUMBER OF PIN	CONFIGURATION
1	This is VCC pin and is used for power on the ADXL 335 accelerometer. It is connected with 3.3V dc power sourc
2	This is ground pin and is used for supplying ground to this ADXL335 accelerometer. It is connected with source ground.
3	This is X pin and is used for analog input in x axis dimension. This pin provides analog input signal to controller which is measured by ADXL 335 accelerome te
4	This is Y pin and is used for analog input in y axis dimension. This pin provides analog input signal to controller which is measured by ADXL 335 accelerometer.
5	This is Z pin and is used for analog input in Z axis dimension. This pin provides analog input signal to controller which is measured by ADXL 335 accelerometer.

4.3.2 WORKING PRINCIPLE OF ADXL 335 ACCELEROMETER

Currently different types of accelerometers are available in market which are used for different purposes. Some works on the principle of MEMS(micro electro mechanical sensor) working. Which consists of a small mass which is etched into silicon surface and then integrated into a small circuit. When force is applied on this mass then it covers some displacement, so acceleration is produced in this mass according to newton second law of motion F= ma which is sensed by its sensor. Similarly, if we talk about analog accelerometers then they work on two principles such as capacitive sensing and piezo electric sensing. Both have different advantages

and disadvantages. Similary, ADXL335 accelerometer is an analog accelerometer therefore it works on the principle of capacitive sensing. In capacitive sensing accelerometer, when it is moved in any direction then its capacitance is changed. When this capacitance is changed then its analog voltages are changed which is sensed by its interfacing controller.

4.4 ULTRASONIC SENSOR

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e. the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target). In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver. The formula for this calculation is D = ½ T x C (where D is the distance, T is the time, and C is the speed of sound ~ 343 meters/second). For example, if a scientist set up an ultrasonic sensor aimed at a box and it took 0.025 seconds for the sound to bounce back, the distance between the ultrasonic sensor and the box would be: D = 0.5 x 0.025 x 343 or about 4.2875 mete

FIG 4.4:ULTRASONIC SENSOR

Ultrasonic sensors are used primarily as proximity sensors. They can be found in automobile self-parking technology and anti-collision safety systems. Ultrasonic sensors are also used in robotic obstacle detection systems, as well as manufacturing technology. In comparison to infrared (IR) sensors in proximity sensing applications, ultrasonic sensors are not as susceptible

to interference of smoke, gas, and other airborne particles (though the physical components are still affected by variables such as heat). Ultrasonic sensors are also used as level sensors to detect, monitor, and regulate liquid levels in closed containers (such as vats in chemical factories). Most notably, ultrasonic technology has enabled the medical industry to produce images of internal organs, identify tumors, and ensure the health of babies in the womb

4.5 BUZZER

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click

FIG 4.5: BUZZER

4.5.1 TYPES

• Electromechanical

Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz (the contacts buzz at line frequency if powered by alternating current) Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.

• Mechanical A joy buzzer is an example of a purely mechanical buzzer and they require drivers. Other examples of them are doorbells

• Piezoelectric

A piezoelectric element may be driven by an oscillating electronic circuit or other audio signal source, driven with a piezoelectric audio amplifier. Sounds commonly used to indicate that a button has been pressed are a click, a ring or a beep.

Interior of a readymade loudspeaker, showing a piezoelectric-disk-beeper (With 3 electrodes ... including 1 feedback-electrode (the central, small electrode joined with red wire in this photo), and an oscillator to self-drive the buzzer. A piezoelectric buzzer/beeper also depends on acoustic cavity resonance or Helmholtz resonance to produce an audible beep.

4.5.2 MODERN APPLICATION

While technological advancements have caused buzzers to be impractical and undesirable, there are still instances in which buzzers and similar circuits may be used. Present day applications include:

• Novelty uses

• Judging panels

• Educational purposes

• Annunciator panels

• Electronic metronomes

• Game show lock-out device 22

4.6 VIBRATOR

The VM0610A3.0 vibration motor is a very powerful and user-friendly motor, which can be useful with a variety of products. This includes pagers, GPS devices, mobile phones or even toys.

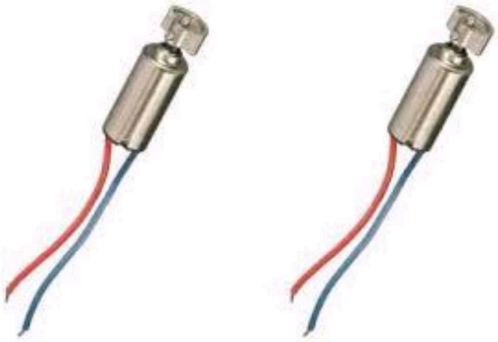


FIG 4.6 : VIBRATOR

\ Technical data:

Power supply: 3 V DC

Power supply: < 150 Ma

Revolutions: 10,000 +/- 2500 rpm

Starting voltage: 0.70 V DC

Starting current: 200 mA

Input impedance: 10 m ohm

Weight: 20 g

Chapter: 5

SOFTWARE REQUIREMENTS

• EMBEDDED C

• ARDUINO IDE

SOFTWARE COMPONENTS EXPLANATION

5.1 EMBEDDED C

Embedded C is a set of language extensions for the C programming language by the C Standards Committee to address commonality issues that exist between C extensions for different embedded systems.

Embedded C programming typically requires nonstandard extensions to the C language in order to support enhanced microprocessor features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations. In 2008, the C Standards Committee extended the C language to address such capabilities by providing a common standard for all implementations to adhere to. It includes a number of features not available in normal C, such as fixed-point arithmetic, named address spaces and basic I/O hardware addressing. Embedded C uses most of the syntax and semantics of standard C, e.g., main() function, variable definition, datatype declaration, conditional statements (if, switch case), loops (while, for), functions, arrays and strings, structures and union, bit operations, macros, etc.

Embedded software is computer software, written to control machines or devices that are not typically thought of as computers, commonly known as embedded systems. It is typically specialized for the particular hardware that it runs on and has time and memory constraints. This term is sometimes used interchangeably with firmware.

A precise and stable characteristic feature is that no or not all functions of embedded software are initiated/controlled via a human interface, but through machine-interfaces instead.

Manufacturers build embedded software into the electronics of cars, telephones, modems, robots, appliances, toys, security systems, pacemakers, televisions and set-top boxes, and digital watches, for example. This software can be very simple, such as lighting controls running on an

8-bit microcontroller with a few kilobytes of memory with the suitable level of processing complexity determined with a Probably Approximately Correct Computation framework (a methodology based 24 on randomized algorithms), or can become very sophisticated in applications such as airplanes, missiles, and process control systems.

5.1.1 OPERATING SYSTEMS

Unlike standard computers that generally use an operating systems such as OS X, Windows or GNU/Linux, embedded software may use no operating system, or when they do use on, a wide variety of operating systems can be chosen from, typically a real-time operating system. Code is typically written in C or C++, but various high-level programming languages, such as Python and JavaScript, are now also in common use to target microcontrollers and embedded systems. Ada is used in some military and aviation projects.

5.1.2 DIFFERENCES FROM APPLICATION SOFTWARE

Most consumers are familiar with application software that provide functionality on a computer. However embedded software is often less visible, but no less complicated. Unlike application software, embedded software has fixed hardware requirements and capabilities, and addition of thirdparty hardware or software is strictly controlled.

Embedded software needs to include all needed device drivers at manufacturing time, and the device drivers are written for the specific hardware. The software is highly dependent on the CPU and specific chips chosen. Most embedded software engineers have at least a passing knowledge of reading schematics, and reading data sheets for components to determine usage of registers and communication system. Conversion between decimal, hexadecimal and binary is useful as well as using bit manipulation.

Web applications are rarely used, although XML files and other output may be passed to a computer for display. File systems with folders are typically absent as are SQL databases

Software development requires use of a cross compiler, which runs on a computer but produces executable code for the target device. Debugging requires use of an in-circuit emulator, JTAG or SWD. Software developers often have access to the complete kernel (OS) source code.

25 Size of the storage memory and RAM can vary significantly. Some systems run in 16 KB of Flash and 4 KB of RAM with a CPU operating at 8 MHz, other systems can rival contemporary

computers. These space requirements lead to more work being done in C or embedded C++, instead of C++. Interpreted languages like BASIC (while e.g. Parallax Propeller can use compiled BASIC) and Java (Java ME Embedded 8.3 is available for e.g. ARM Cortex-M4, Cortex-M7 microcontrollers and older ARM11 used in Raspberry Pi and Intel Galileo Gen. 2) are not commonly used; while an implementation of the interpreted Python 3 language – MicroPython – is however available expressly for microcontroller use, e.g. 32-bit ARM-based (such as BBC micro:bit) and 16-bit PIC microcontrollers.

5.1.3 COMMUNICATION PROTOCOLS

Communications between processors and between one processor and other components are essential. Besides direct memory addressing, common protocols include I²C, SPI, serial ports, and USB. Communications protocols designed for use in embedded systems are available as closed source from companies including InterNiche Technologies and CMX Systems. Open-source protocols stem from uIP, lwip, and others

5.2ARDUINO IDE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

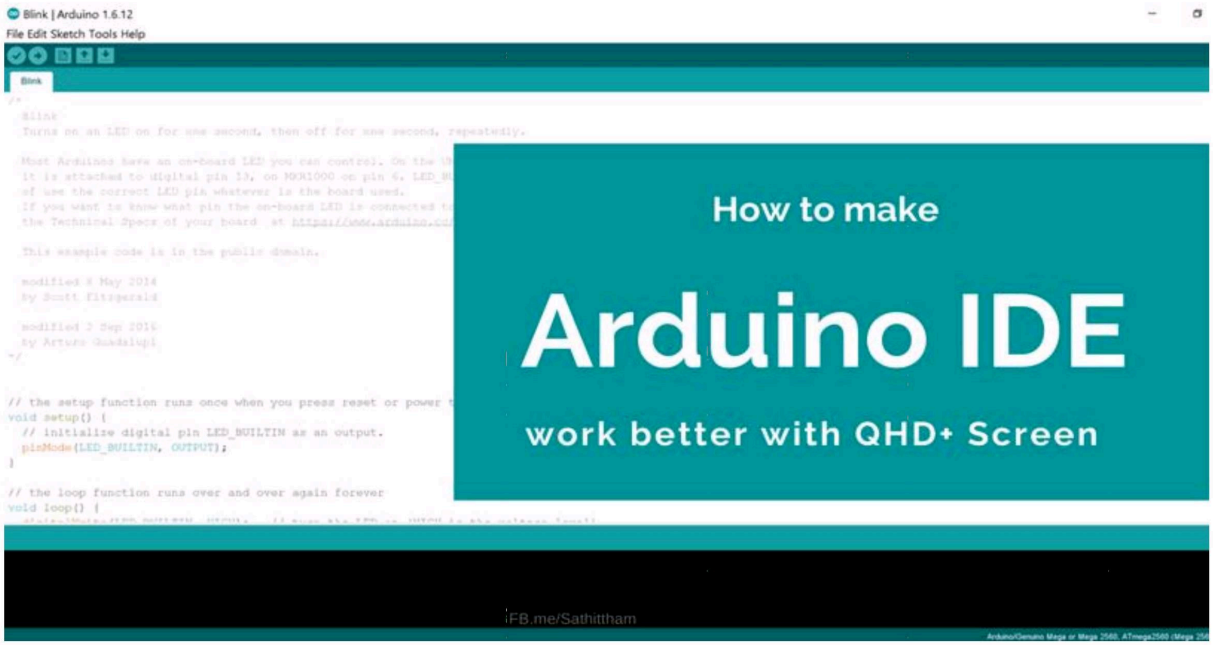


FIG 5.2:ARDUINO IDE

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware. By default, avrdude is used as the uploading tool to flash the user code onto official Arduino boards.

With the rising popularity of Arduino as a software platform, other vendors started to implement custom open source compilers and tools (cores) that can build and upload sketches to other microcontrollers that are not supported by Arduino's official line of microcontrollers.

In October 2019 the Arduino organization began providing early access to a new Arduino Pro IDE with debugging and other advanced features.

Arduino (/ɑːrˈdwiːnoʊ/) is an open-source hardware and software company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices. It's hardware products are licensed under a CC-BY-SA license, while software is licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone.

Arduino boards are available commercially from the official website or through authorized distributors. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards ('shields') or breadboards (for prototyping) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers can be programmed using the C and C++ programming languages, using a standard API which is also known as the "Arduino language". In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) and a command line tool (arduino-cli) developed in Go.

The Arduino project began in 2005 as a tool for students at the Interaction Design Institute Ivrea in Ivrea, Italy, aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats and motion detectors.

The name Arduino comes from a bar in Ivrea, Italy, where some of the founders of the project used to meet. The bar was named after Arduin of Ivrea, who was the margrave of the March of Ivrea and King of Italy from 1002 to 1014.

A program for Arduino hardware may be written in any programming language with compilers that produce binary machine code for the target processor. Atmel provides a development 28 environment for their 8-bit AVR and 32-bit ARM Cortex-M based microcontrollers: AVR Studio (older) and Atmel Studio (newer)

5.2.1 IDE

The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, macOS, and Linux) that is written in the programming language Java. It originated from the IDE for the languages Processing and Wiring. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic indenting, brace matching, and syntax highlighting, and provides simple one-click mechanisms to compile and upload programs to an Arduino board. It also contains a message area, a text console, a toolbar with buttons for common functions and a hierarchy of operation menus. The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

5.2.2 PRO IDE

On October 18, 2019, Arduino Pro IDE (alpha preview) was released. The system still uses Arduino CLI (Command Line Interface), but improvements include a more professional development environment, autocompletion support, and Git integration. The application frontend is based on the Eclipse This is a Open Source IDE. The main features available in the alpha release are –

• Modern, fully featured development environment

• Dual Mode, Classic Mode (identical to the Classic Arduino IDE) and Pro Mode (File System view)

• New Board Manager

• New Library Manager

• Board List 29

• Basic Auto-Completion (Arm targets only)

• Git Integration

• Serial Monitor

• Dark Mode Sketch A sketch is a program written with the Arduino IDE. Sketches are saved on the development computer as text files with the file extension .ino. Arduino Software (IDE) pre1.0 saved sketches with the extension .pde. A minimal Arduino C/C++ program consists of only two functions:

• setup(): This function is called once when a sketch starts after power-up or reset. It is used to initialize variables, input and output pin modes, and other libraries needed in the sketch. It is analogous to the function main().

• loop(): After setup() function exits (ends), the loop() function is executed repeatedly in the main program. It controls the board until the board is powered off or is reset. It is analogous to the function while(1).

5.2.3 SKETCH

A sketch is a program written with the Arduino IDE. Sketches are saved on the development computer as text files with the file extension .ino. Arduino Software (IDE) pre-1.0 saved sketches with the extension .pde.

A minimal Arduino C/C++ program consists of only two functions:

• setup(): This function is called once when a sketch starts after power-up or reset. It is used to initialize variables, input and output pin modes, and other libraries needed in the sketch. It is analogous to the function main().

• loop(): After setup() function exits (ends), the loop() function is executed repeatedly in the main program. It controls the board until the board is powered off or is reset. It is analogous to the function while(1).

5.2.4 APPLICATIONS

• Arduboy, a handheld game console based on Arduino

• Arduinome, a MIDI controller device that mimics the Monome

• Ardupilot, drone software and hardware

• ArduSat, a cubesat based on Arduino.

• C-STEM Studio, a platform for hands-on integrated learning of computing, science, technology, engineering, and mathematics (C-STEM) with robotics.

• Data loggers for scientific research

. • OBDuino, a trip computer that uses the on-board diagnostics interface found in most modern cars

• OpenEVSE an open-source electric vehicle charger

• XOD, a visual programming language for Arduino.

Chapter 6

RESULT IMPLEMENTATION

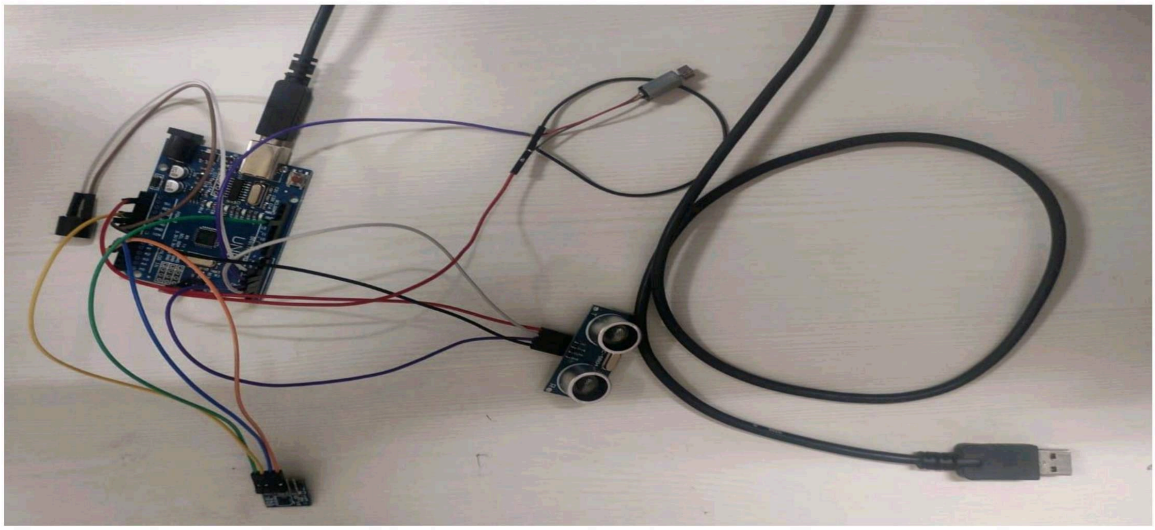
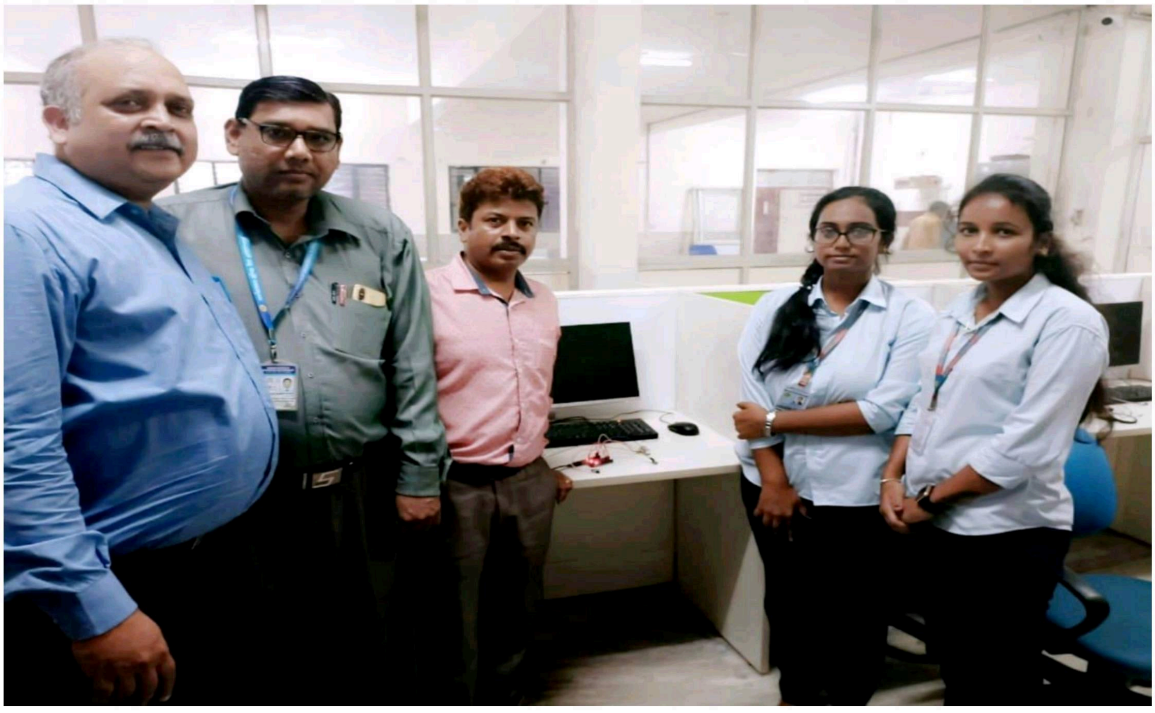


FIG6.1:MECHANICAL SETUP



Team members with prof.Aijaz ahammed sharief.HOD dept.of ECE.prof.Raghavendra D.mini project co ordinator and Jayachandra aradhya CEO of silicon microsystem,

CONCLUSION

The Blind Walking Stick has been finally made into prototype that can be used to guide theblind. It aims to solve the problems faced by the blind people in their daily life. The system also takes the measure to ensure their safety. This project will help all the blind people in the world and will make it easier for them to walk. It was done to help the blind move ahead very well. It helps to facilitate the movement ensuring safety.

FUTURESCOPE

Few improvements can be made to the sensor angle placement to make them adjust according to the angle of the stick w.r.t to the ground so that they always point straight instead of mounting them at a static angle. Also, it can be further enhanced by using a better material such as carbon fiber for the body of the stick to make it lightweight and flexible to use. A GPS navigation system can also be improved for the blind to move from source to destination by informing/announcing the directions via headphones

REFERENCES

[1] Navigation Gadget for visually impaired based on IOT by N.Sathya mala, S.Sushmi Thushara, Sankari Subbiah, 2nd International Conference on Computing and Communications Technologies (ICCCT), 2017.

[2] Cost Efficient Autonomous Navigation System (E-Cane) for visually impaired human beings by Apan Dastider, Bivas Basak, Md. Safayatullah, Celia Shahnaz, Shaikh Anowarul Fattah, Department of Electrical and Electronic Department, Bangladesh University of Engineering and Technology, Dhaka 1205, Bangladesh.

[3] Sound and touch based smart cane: Better walking experience for visually challenged by Rajesh Kannan Megalingam, Aparna Nambissan, Anu Thambi from Amrita Vishwa Vidyapeetham, Kollam, published by 2014 IEEE Canada International Humanitarian Technology Conference - (IHTC).

[4] Smart cane with range notification for blind people by M.F. Saaid, A. M. Mohammad, M. S. A. Megat Ali from Faculty of Electrical Engineering, Universiti Teknologi MARA, Shah Alam, Selangor published in 2016 IEEE International Conference on Automatic Control and Intelligent Systems (I2CACIS) .

[5] IoT based smart walking cane for typhlotic with voice assistance by SathyaNarayanan E, Gokul Deepan D, Nithin B P from Department of Electronics and Communication Engineering, PSG College of Technology, published in 2016 Online International Conference on Green Engineering and Technologies (IC-GET).

[6] Indriya - A smart guidance system for the visually impaired by Sujith B Kallara, Mitu Raj, Roshan Raju from Department of Electronics and Communication, ER&DCI - Institute of Technology, Center for Development of Advanced Computing (CDAC) published in 2017 International Conference on Inventive Computing and Informatics (ICICI).

[7] A Smart Infrared Microcontroller-Based Blind Guidance System Amjed S. Al-Fahoum, Heba B. Al Hmoud, and Ausaila A. Al-Fraihat Biomedical Systems and Informatics Engineering Department, Hijjawi Faculty for Engineering Technology, Yarmouk University, Irbid 21163, Jordan.

CODE FOR SMART BLIND STICK

```
#define buzzer 5
#define vibration 4
#define y A1
#define x A0
int xaxis;
int yaxis;
#define trig1 2
#define echo1 3
int duration1;
int cm1;
void setup()
{
Serial.begin(9600);
pinMode(buzzer, OUTPUT);
pinMode(vibration, OUTPUT);
digitalWrite(vibration, HIGH);
pinMode(x, INPUT);
pinMode(y, INPUT);
pinMode(trig1, OUTPUT);
pinMode(echo1, INPUT);
```

```
}
void loop()
 {
 adxl();
 ultrasonic1();
 }
 void ultrasonic1()
{
digitalWrite(trig1, LOW);
 delay(2);
 digitalWrite(trig1, HIGH);
 delay(10);
 digitalWrite(trig1, LOW);
 duration1 = pulseIn(echo1, HIGH);
 cm1 = duration1 *( 0.034/2);
 if(cm1 <= 15)
{
digitalWrite(vibration, LOW);
 }
Else
 {
 digitalWrite(vibration, HIGH);
```

```
 }
 }
void adxl()
{
 xaxis = analogRead(x);
 yaxis = analogRead(y);
 Serial.print("x = ");
 Serial.print(xaxis);
 Serial.print(" y = ");
 Serial.println(yaxis);
 if(xaxis>300 || yaxis350)
 {
Serial.print("fallen");
 digitalWrite(buzzer, HIGH);
 delay(1000);
 digitalWrite(buzzer, LOW);
delay(1000);
}
}
```