Title of the Practice: Evening Prep Classes

Duration 2021 - Present

Year of Inception: 2021

Status: Ongoing

Objectives of the Practice:

- To assist students in understanding and learning subjects with more interaction with the subject faculty.
- To help students achieve their personal academic goals by preparing them for extra opportunities for a better understanding of the subjects.
- To help students become independent learners.
- To provide guidance towards a suitable and pertinent artistic path adapted to the needs and abilities of each student.
- To provide assistance to improve the grades of the students.
- To train the students in understanding with experiential learning and a practical approach.
- To enhance the skills of the students to apply their knowledge to face and resolve real-time challenges.

Context:

1. Skills and talent are the driving forces of economic growth and social development in the country.
2. In today's global scenario, it is crucial for learners of any institute to acquire extra knowledge beyond the regular course of study as prescribed in the curriculum.
3. All students need to enhance their knowledge to not only be part of the race but to win it.
4. In this process of enhancement, students need to acquire various types of knowledge and techniques to deal with day-to-day life challenges and get ready for the industry.
5. Hence, to provide students with the stepping stone, AIEMS decided to start Evening Prep Classes to enhance students' skills and knowledge, making them industry-ready.

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Practice:

1. All departments of the college have designed various skill development courses to bridge the gap between the curriculum and the requirements of the industry and corporate sectors, providing extra knowledge to the students.

2. Apart from that, every department designates a faculty member to engage in doubt-clearing sessions for the students once a week.

3. These sessions are organized in accordance with the college's vision and mission, along with harmonization with students' objectives of the department.

4. These structured sessions aim for active student participation at every level, allowing students to learn through real-time situations.

5. Guidelines issued by the Principal regarding such sessions are planned and executed at the college level.

6. An organizing committee of teachers works under the able guidance of the Principal.

7. Various types of sessions such as Quizzes, Essay Writing, Elocution, Aptitude Tests, Innovative Concept Presentations, etc., are conducted.

8. Students are well-informed in advance about the format, conduct, and assessment methodologies during the sessions.

9. Students are appreciated, and winners are felicitated with certificates.

Evidence of Success:

1. All records in the form of application letters duly signed by the Principal for permission, program notices, participant attendance records, and photographs are maintained.

2. There is an increase in student performance in both internal and external examinations.

3. There is an increase in the number of students placed in various industries and corporates.

4. Considerable knowledge and skill upgradation are seen in participating students.

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Problems Encountered and Resources Required:

1. Restructuring of formats to keep pace with innovations and creativity.
2. Maintenance of standards and levels.
3. Motivation of teaching staff and students.

Marks Sheet

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Sl No	Name	USN	BMATS101 MATHS						
			CIE 1 (30 Marks)	CIE 2 (30 Marks)	CIE 3 (30 Marks)	AVERAGE (20 Marks)	ASSIGNMENT (10 Marks)	LAB (20 Marks)	TOTAL (50 Marks)
1	ABHILASH T S	1AR22CS001	26	24	26	17	10	19	46
2	ABHISHEK V KARVEE	1AR22CS002	15	4	19	8	10	18	36
3	ADARSH B M	1AR22CS003	17	13	15	10	10	18	38
4	AMAN KUMAR	1AR22CS004	11	2	21	8	10	17	35
5	ANIL B KANASAGERI	1AR22CS005	26	18	25	15	10	19	44
6	ANKIT C PATIL	1AR22CS006	26	27	21	16	10	18	44
7	ANUSHREE HS JOIS	1AR22CS007	18	23	17	13	10	19	42
8	BHAVANI S P	1AR22CS008	28	20	13	14	10	18	42
9	BHEEMAREDDY	1AR22CS009	24	12	27	14	10	20	44
10	CHAITHANYA K	1AR22CS010	29	27	22	17	10	20	47
11	CHANDANA S P	1AR22CS011	19	17	19	12	10	18	40
12	CHIDANANDAYYA	1AR22CS012	20	2	4	6	10	20	36
13	CHITRA HP	1AR22CS013	11	23	20	12	10	20	42
14	DEEKSHITH D	1AR22CS014	12	15	AB	6	10	19	35
15	DEEPIKA A	1AR22CS015	21	8	22	11	10	18	39
16	DIGAMBAR MORE	1AR22CS016	19	17	3	9	10	18	37
17	HANEESH REDDY G	1AR22CS017	1	9	2	3	10	18	31
18	GREESHMA U	1AR22CS018	30	23	29	18	10	20	48
19	HARSHA S DESAI	1AR22CS019	22	27	21	16	10	20	46

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MATHEMATICS

FINAL INTERNAL MARKS LIST EC

Sl.No	Roll no.	Name	INTERNAL MARKS				assignment	practical	total
			Scored I internal	scored II internal	SCORED III internal	OUT OF 20			
1	1AR22EC001	ABHINAV M PATIL	6	6	16	6	10	18	34
2	1AR22EC002	ADARSHA B PATIL	28	19	27	16	10	19	45
3	1AR22EC003	AISHWARYA BH	25	15	27	15	10	16	41
4	1AR22EC004	AJAYKUMAR	22	11	23	12	10	18	40
5	1AR22EC005	AMULYA B V	16	10	14	9	10	19	38
6	1AR22EC006	ANAND M VERNEKAR	12	9	2	5	10	20	35
7	1AR22EC007	ANILKUMAR	1	6	18	6	10	15	31
8	1AR22EC008	ANURAG P SHIRODKAR	20	10	15	10	10	19	39
9	1AR22EC009	APEKSHA PO	6	4	24	8	10	17	35
10	1AR22EC010	BHARATH	12	6	20	8	10	20	38
11	1AR22EC011	CHAITANYA VENKATRAMU	11	9	12	7	10	19	36
12	1AR22EC012	CHAITHANYA VENKATACHALA	10	10	16	8	10	19	37
13	1AR22EC013	CHANDRASHEKHAR BH	20	12	17	11	10	19	40
14	1AR22EC014	GUNAVATHI	10	4	4	4	10	15	29
15	1AR22EC015	JANANESH V	15	7	3	6	10	20	36
16	1AR22EC016	KARTHIK P	18	14	16	11	10	18	39
17	1AR22EC017	KEERTHANA S	28	20	19	15	10	15	40
18	1AR22EC018	KUSHI P	15	9	17	9	10	20	39
19	1AR22EC019	MAITHRI KN	28	24	28	18	10	18	46
20	1AR22EC020	MANOJ KUMAR K	17	6	13	8	10	20	38
21	1AR22EC021	MANOJ M	17	12	17	10	10	19	39
		[illegible]	2	4	12	4	10	18	32

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Attendance Of the Prep Classes

Register of Attendance for the Month for 12/12/20 – 31/03/21

Sl No.	Name	USN	12/12 24/1	13/12 25/1	14/12 27/1	15/12 30/1	19/12 3/2	20/12 5/2	21/12 8/2	22/12 3/3	23/12 6/3	26/12 7/3	29/12 8/3	28/12 9/3	30/12 10/3	2/1 14/3
1	Tejbahadur		1 / 27	2 / 28	3 / 29	4 / 30	5 / 31	6 / 32	7 / 33	8 / 34	9 / 35	10 / 36	11 / 37	12 / 38	13 / 39	13 / 40
2	vijay Reddy		0 / 27	1 / 28	2 / 29	3 / 30	4 / 31	5 / 32	6 / 33	7 / 34	8 / 35	9 / 36	9 / 37	10 / 38	11 / 39	12 / 40
3	Abhilash T.S		1 / 28	2 / 29	2 / 30	3 / 31	4 / 32	5 / 33	6 / 34	7 / 35	8 / 36	9 / 37	10 / 38	11 / 39	12 / 40	13 / 41
4	Abhishek Karaveermath		1 / 27	2 / 28	3 / 29	3 / 30	4 / 31	5 / 32	5 / 33	5 / 34	6 / 35	7 / 36	8 / 37	9 / 38	10 / 39	11 / 40
5	Anil Kanasageri		1 / 28	1 / 29	1 / 30	2 / 31	3 / 32	4 / 33	5 / 34	6 / 35	7 / 36	8 / 37	9 / 38	10 / 39	11 / 40	12 / 41
6	Ankit		1 / 28	2 / 28	3 / 29	3 / 30	3 / 31	4 / 32	5 / 33	6 / 34	7 / 35	8 / 36	9 / 37	10 / 38	11 / 39	12 / 41
7	chidanandayy Hiremath		1 / 27	2 / 28	3 / 29	4 / 30	5 / 31	6 / 32	7 / 33	8 / 34	9 / 35	10 / 36	11 / 37	12 / 38	12 / 39	1[illegible] / 40
8	Deekshit .D		1 / 29	2 / 30	3 / 31	4 / 32	5 / 33	6 / 34	7 / 35	8 / 36	9 / 37	10 / 38	11 / 39	12 / 40	13 / 41	14 / 4[illegible]
9	keerthan veeshwakarma		1 / 30	2 / 31	3 / 32	4 / 33	5 / 34	6 / 35	7 / 36	8 / 37	9 / 38	10 / 39	11 / 40	12 / 41	13 / 42	1[illegible] / 4[illegible]
10	Manoj nayak		1 / 28	2 / 29	3 / 30	3 / 31	4 / 32	5 / 33	6 / 34	7 / 35	8 / 36	9 / 37	10 / 38	11 / 39	12 / 40	13 / 4[illegible]
11	Preetham B.N		1 / 29	2 / 30	3 / 31	4 / 32	5 / 33	6 / 34	7 / 35	8 / 36	9 / 37	10 / 38	11 / 39	12 / 40	13 / 41	14 / 4[illegible]
12	Prem sai		0 / 29	1 / 30	2 / 31	3 / 32	4 / 33	5 / 34	6 / 35	7 / 36	8 / 37	9 / 38	10 / 39	11 / 40	12 / 41	1[illegible] / 4[illegible]
Signature of Staff																
Signature of H.O.D.																

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Register of Attendance for the Month for 25/09/2023 – 20/01/2024

Sl No.	Name	USN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	Mahantesh C.K		P	P	P	P	P	P	P	P	P	P	P	P	P
			P	P	P	P	P	P	P	P	P	P	P	P	P
2	V. Abhilash Reddy		P	P	P	P	P	P	P	P	P	P	P	P	P
			A	A	P	P	P	A	P	P	P	P	P	P	P
3	Santhosh		P	P	P	P	P	P	P	P	P	P	P	P	P
			A	P	P	P	P	P	P	P	P	P	P	P	P
4	Prasanna V Shirol		P	P	P	P	P	P	P	P	P	P	P	P	P
			A	P	A	P	A	P	P	P	P	P	P	P	P
5	Akash Bidar Biradar		P	P	P	P	P	P	A	P	P	P	P	P	A
			A	P	P	P	P	A	P	P	P	P	P	P	P
6	Yashwanth N		P	A	P	P	P	P	P	P	P	A	A	P	P
			P	P	P	P	P	P	P	P	P	P	P	P	P
7	Pramod Kumar		P	P	P	P	P	P	P	P	P	P	P	P	P
			P	P	P	P	P	P	P	P	P	P	P	P	P
8	Manoth Gowda		P	P	P	P	P	P	P	P	P	P	A	P	A
			P	A	P	P	P	P	P	P	P	A	P	P	P
9	Simon Leo Alexander		P	P	P	P	P	P	P	P	P	P	P	P	A
			P	P	P	P	P	P	P	P	A	P	P	P	P
10	Vikram S		P	P	P	P	P	P	A	P	P	P	P	P	P
			P	A	P	A	P	P	P	P	P	P	P	P	A
11	Sathwik K Ural		P	P	P	P	P	P	P	P	P	P	P	A	P
			A	A	P	P	P	P	P	P	P	P	P	P	P
12	Mahesh		P	P	P	P	P	P	P	P	A	P	A	A	P
			A	A	P	P	P	P	P	P	P	P	P	P	P
	Signature of Staff														
	Signature of H.O.D														

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Title of the Practice: Project-Based Learning in First Year

Duration: 2022 - Present

Year of Inception: 2022

Status: Ongoing

Objectives of the Practice:

- To apply the knowledge gained in the first year of engineering through a practical project experience.
- To provide first-year students with hands-on project experience guided by faculty members.
- To enhance collaboration and teamwork skills by working in student groups of 5 to 10 members.
- To develop problem-solving, critical thinking, and innovation skills among first-year students.
- To facilitate a practical application of theoretical concepts learned in the classroom.

Context:

1. Practical application of theoretical knowledge plays a vital role in the learning process.
2. Project-based learning enhances student engagement and fosters practical skills development.
3. Collaboration and teamwork are essential skills required in the professional world.
4. Providing real-world project opportunities to first-year students nurtures a problem-solving mindset early in their academic journey.

Practice:

1. By the end of the first year, first-year students will undertake a project that applies the knowledge acquired during their engineering course.
2. The projects will be guided by faculty members to ensure proper mentorship and supervision.
3. Students will work in groups consisting of 5 to 10 members to encourage collaboration and diverse perspectives.

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4. The project-based learning approach will focus on hands-on application, problem-solving, and practical implementation of engineering concepts.

5. Regular checkpoints and feedback sessions will be conducted to monitor the progress of the projects and provide necessary guidance.

6. Emphasis will be placed on cultivating innovation, critical thinking, and communication skills through the project work.

7. The projects will culminate in a final presentation or demonstration to showcase the students' learning outcomes.

Evidence of Success:

1. Documentation of project outcomes, including project reports, presentations, and evaluations.

2. Improvement in students' practical skills, problem-solving abilities, and teamwork dynamics.

3. Enhanced understanding and application of theoretical concepts demonstrated through the project work.

4. Positive feedback from students, faculty, and external evaluators on the effectiveness of project-based learning in the first year.

Problems Encountered and Resources Required:

1. Allocation of resources for project materials, equipment, and facilities.

2. Ensuring adequate faculty support and mentorship for guiding student projects.

3. Promoting active student participation and engagement throughout the project duration.

4. Ensuring that every student understands and adopts the problem-solving mindset during their first year is challenging.

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A MINI PROJECT REPORT ON

"SMART BLIND STICK"

Academic Year

2022-23

SUBMITTED BY:

RAHUL V (1AR22CS041)

RAMYA SHREE S M (1AR22CS042)

ROHAN (1AR22CS043)

SAHANA S (1AR22CS044)

SAMIULLA (1AR22CS045)

SANDEEP K (1AR22CS046)

SHAMANTH B M (1AR22CS047)

SHARATH M (1AR22CS048)

SHIVASHANKAR K (1AR22CS049)

SHWETHA S (1AR22CS050)

VISHAL SHIVASHARAN BILUR (1AR22CS062)

SUBMITTED TO:

Prof. SHERYAS S

HOD

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CONTENTS

INTRODUCTION

Visually impaired people are the people who find it difficult to recognize the smallest detail with healthy eyes. Those who have the visual acuteness of 6/60 or the horizontal range of the visual field with both eyes open have less than or equal to 20 degrees. These people are regarded as blind. A survey by WHO (World Health Organization) carried out in 2011 estimates that in the world, about 1% of the human population is visually impaired (about 70 million people) and amongst them, about 10% are fully blind (about 7 million people) and 90% (about 63 million people) with low vision. The main problem with blind people is how to navigate their way to wherever they want to go. Such people need assistance from others with good eyesight. As described by WHO, 10% of the visually impaired have no functional eyesight at all to help them move around without assistance and safely.

This mini project proposes a new technique for designing a smart stick to help visually impaired people that will provide them navigation. The conventional and archaic navigation aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs which are characterized by many imperfections. The most critical shortcomings of these aids include: essential skills and training phase, range of motion, and very insignificant information communicated being communicated. Our approach modified this cane with some electronics components and sensors, the electronic aiding devices are designed to solve such issues. The ultrasonic sensors, buzzer and RF transmitter/Receiver are used to record information about the presence of obstacles on the road. Ultrasonic sensor have the capacity to detect any obstacle within the distance of 2cm-450cm. Therefore whenever there is an obstacle in this range it will alert the user. Most blind guidance systems use ultrasound because of its immunity to the environmental noise. With the rapid advances of modern technology both in hardware and software it has become easier to provide intelligent navigation system to the visually impaired.

Recently, much research effort have been focused on the design of electronic travel aids (ETA) to aid the successful and free navigation of the blind. Also, high-end technological solution have been introduced recently to held blind person navigate independently. Another reason why ultrasonic is prevalent is that the technology is reasonably cheap. Moreover , ultrasound emitter and detector are portable components that can be carried without the need for complex circuits. RF module will help the person to find the stick wherever it is placed.

The objectives of this mini project include: to design an assistive technology for visually impaired people that can detect obstacles and provide alternative routes for the blind; to alarm the user through vibration to determine the obstacles direction source; and to help the user the find his stick when he cannot remember where is was kept. Several attempts have been made to design guard or obstacle avoidance devices for the blind using components with limited number of application. This section will discuss some of these attempts and their shortcoming. For instance, proposed a smart walking stick for visually impaired. The proposed method is a simple walking stick equipped with sensors to give information about the environment.

OBJECTIVE

The main objective is to help visually challenged people to navigate with ease using advanced technology. In this technology controlled world, where people strive to live independently, this project proposes an ultrasonic stick for blind people to help them gain personal independence. Since this is economical and not bulky, one can make use for it easily.

SYSTEM ANALYSIS

A smart blind stick is a device designed to assist visually impaired individuals in navigating their surroundings. It uses a combination of sensors and technologies to provide users with audio or tactile feedback on obstacles or hazards in their path. Here is a system analysis of a smart blind stick:

SENSORS: A smart blind stick typically incorporates a range of sensors such as ultrasonic sensors, infrared sensors, gyroscopes. These sensors detect the presence of obstacles and provide feedback to the user.

MICROCONTROLLER: The microcontroller is the brain of the smart blind stick. It processes the sensor data and generates appropriate audio or tactile feedback signals for the user.

POWER SUPPLY: The smart blind stick requires a reliable power supply to function effectively. This can be a rechargeable battery or a replaceable battery

AUDIO OR TACTILE FEEDBACK SYSTEM: The smart blind stick provides audio or tactile feedback to the user based on the sensor data. Audio feedback can be generated using speakers, while tactile feedback can be provided using vibration motors.

CONNECTIVITY: Some smart blind sticks also incorporate connectivity features such as Bluetooth or Wi-Fi. This enables them to communicate with other devices such as smartphones or smart home assistants.

ERGONOMICS: The design of the smart blind stick should be ergonomic, easy to hold, and easy to use. This can be achieved through careful consideration of the materials used, the weight of the device, and the placement of controls.

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DURABILITY: The smart blind stick must be durable and able to withstand daily wear and tear. This can be achieved through the use of high-quality materials and careful design.

USER INTERFACE: The smart blind stick must have a user-friendly interface that allows the user to adjust settings, turn the device on or off, and receive feedback. This can be achieved through the use of simple buttons or touch controls.

In conclusion, a smart blind stick is a complex device that requires careful consideration of multiple factors to ensure it functions effectively for the visually impaired. By incorporating a range of sensors, a microcontroller, and audio or tactile feedback systems, a smart blind stick can provide valuable assistance to those with visual impairments.

PROPOSED SYSTEM

Blind stick is an innovative stick designed for visually disabled people for improved navigation. We here propose an advanced blind stick that allows visually challenged people to navigate with ease using advanced technology. The blind stick is integrated with ultrasonic sensor. Our proposed project first uses ultrasonic sensors to detect obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the microcontroller. The microcontroller then processes this data and calculates if the obstacle is close enough.

If the obstacle is not that close the circuit does nothing. If the obstacle is close the microcontroller sends a signal to sound a buzzer. It also detects and sounds a different buzzer if it detects water and alerts the blind. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today.98 percent of all microprocessors are manufactured as components of embedded systems. With general-purpose counterparts are low power consumption, small size, rugged operating ranges, and low per-unit cost. This comes at the price of limited processing resources, which make them significantly more difficult to program and to interface with. However, by building intelligence mechanisms on the top of the hardware, taking advantage of possible existing sensors and the existence of a network of embedded units, one can both optimally manage available resources at the unit and network levels as well as provide augmented functionalities, well beyond those available

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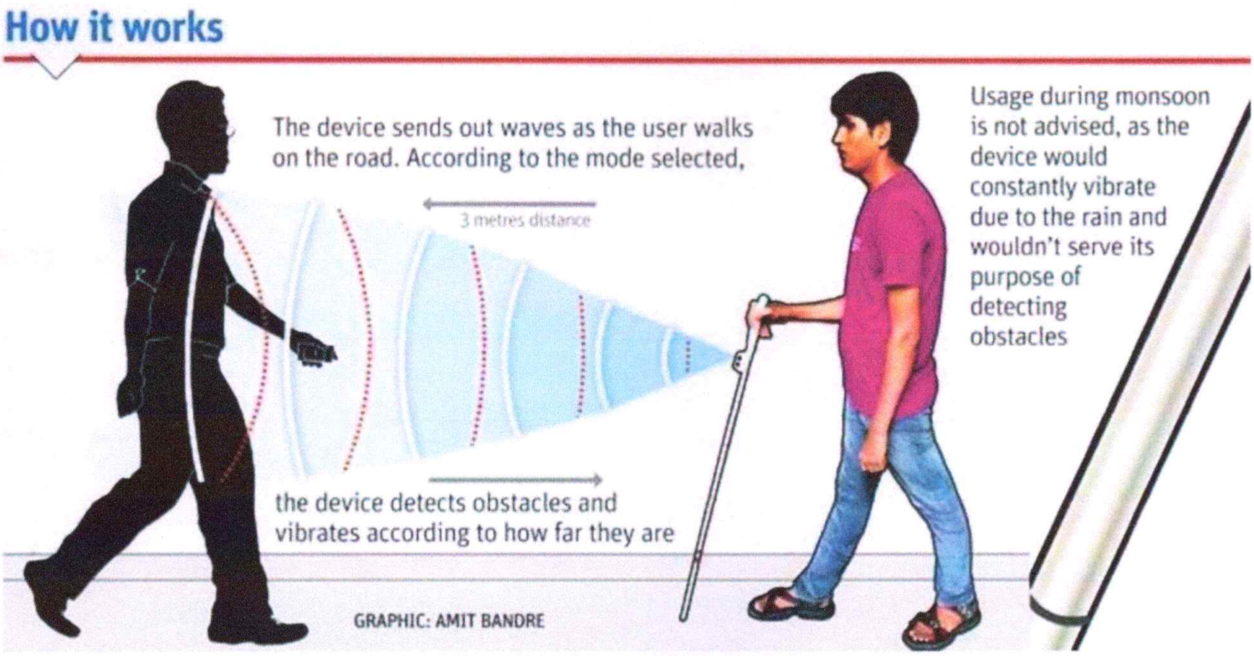

Fig 1 Working of blind stick

For example, intelligent techniques can be designed to manage power consumption of embedded systems. Modern embedded systems are often based on microcontrollers (i.e. CPUs with integrated memory or peripheral interfaces) but ordinary microprocessors (using external chips for memory and peripheral interface circuits) are also common, especially in more complex systems. In either case, the processor(s) used may be types ranging from general purpose to those specialized in certain class of computations or even custom designed for the application at hand. Since the embedded system is dedicated to specific tasks, design engineers can optimize it to reduce the size and cost of the product and increase the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.

OBJECTIVE OF PROPOSED SYSTEM

The objective of a smart blind stick is to provide enhanced mobility and independence to people with visual impairments. It is designed to detect obstacles, drop-offs, and other hazards in the user's path and alert the user through various means, such as vibration, sound, or voice.

Smart blind sticks are equipped with sensors, buzzer and other electronic components that help the user navigate safely and effectively in their surroundings. They may also include additional features, such as GPS navigation, route planning, and voice recognition, to further assist the user in their daily activities.

Overall, the objective of a smart blind stick is to improve the quality of life for people with visual impairments by providing them with a reliable and effective tool for independent mobility.

SYSTEM REQUIREMENT SPECIFICATION

HARDWARE REQUIREMENT

Hardware requirements of smart blind stick

The hardware requirements of a smart blind stick may vary depending on the specific features and functionalities it offers. However, here are some common hardware components that are typically included in a smart blind stick:

ULTRASONIC SENSOR: This sensor helps to detect obstacles in the path of the user and can alert them through audio or tactical feedback.

VIBRATING MOTOR: A vibrating motor can be used to provide haptic feedback to the user to alert them of any obstacles. Battery: A rechargeable battery is required to power the smart blind stick.

BUZZER: An Arduino buzzer is also called a piezo buzzer. It is basically a tiny speaker that you can connect directly to a Microcontroller (Arduino Uno). It detect any obstacles in front of the blind user and through this alarming unit or buzzer blind user get alert when buzzer starts sounding after sensors detecting any hurdle in front of the user.

SWITCH: The remote built on RF transmitter has a switch pressing which, the buzzer installed on the stick is triggered and by the sound of the buzzer a blind person can find the stick.

These are just some of the common hardware requirements for a smart blind stick. The specific components and features may vary depending on the design and intended use of the device.

SOFTWARE REQUIREMENTS

To develop a smart blind stick, it would typically need software requirements such as a navigation system, obstacle detection, and audio feedback capabilities. These features would help enhance the functionality and safety of the blind stick.

In addition to the navigation system, obstacle detection, and audio feedback, you might also consider incorporating features like GPS for location tracking, voice recognition for hands-free control, and connectivity options for data transfer and updates. It's important to prioritize user-friendly interfaces and customizable settings to cater to individual needs.

Real-time object recognition, intelligent route planning, adjustable sensitivity settings, and integration with mobile applications for additional functionality. These features would enhance the overall usability and effectiveness of the smart blind stick

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SYSTEM DESIGN

PRINCIPLE OF OPERATION

The system development life cycle is the process of developing and changing processes, as well as the models and methodologies used to construct an application and a software development process. It involves the following steps:

Preparation: Needs evaluations, feasibility studies (both scientific and technological), and scheduling are also carried out as part of the planning phase.

Analysis: Direct observation is used during the research process to look at the problems that arise and are found in the materials, software, and hardware.

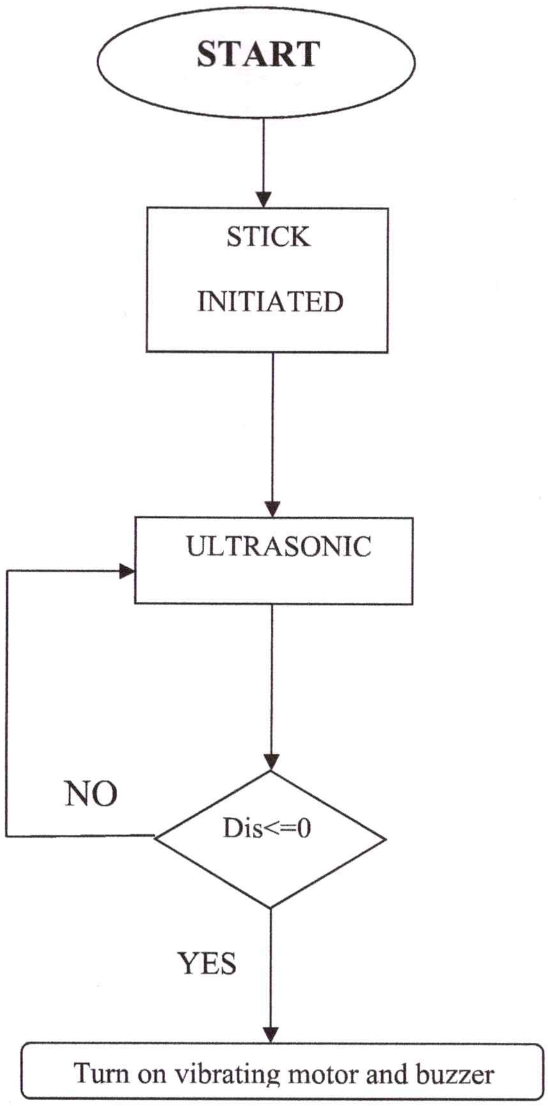
Design: At this point, the application will be explained in detail regarding the design phase of each component in the prototype under the needs addressed earlier in the prototype.

Implementation: The code is brought to life at this stage by selecting components and planning the software (coding/coding).

Testing: Testing is carried out at this point to see if the framework created satisfies the user's needs; if it does not, the next phase is iterative, i.e. returning to the previous stages. And the test is designed to identify and eliminate flaws in the device so that it can truly assist users in their everyday activities.

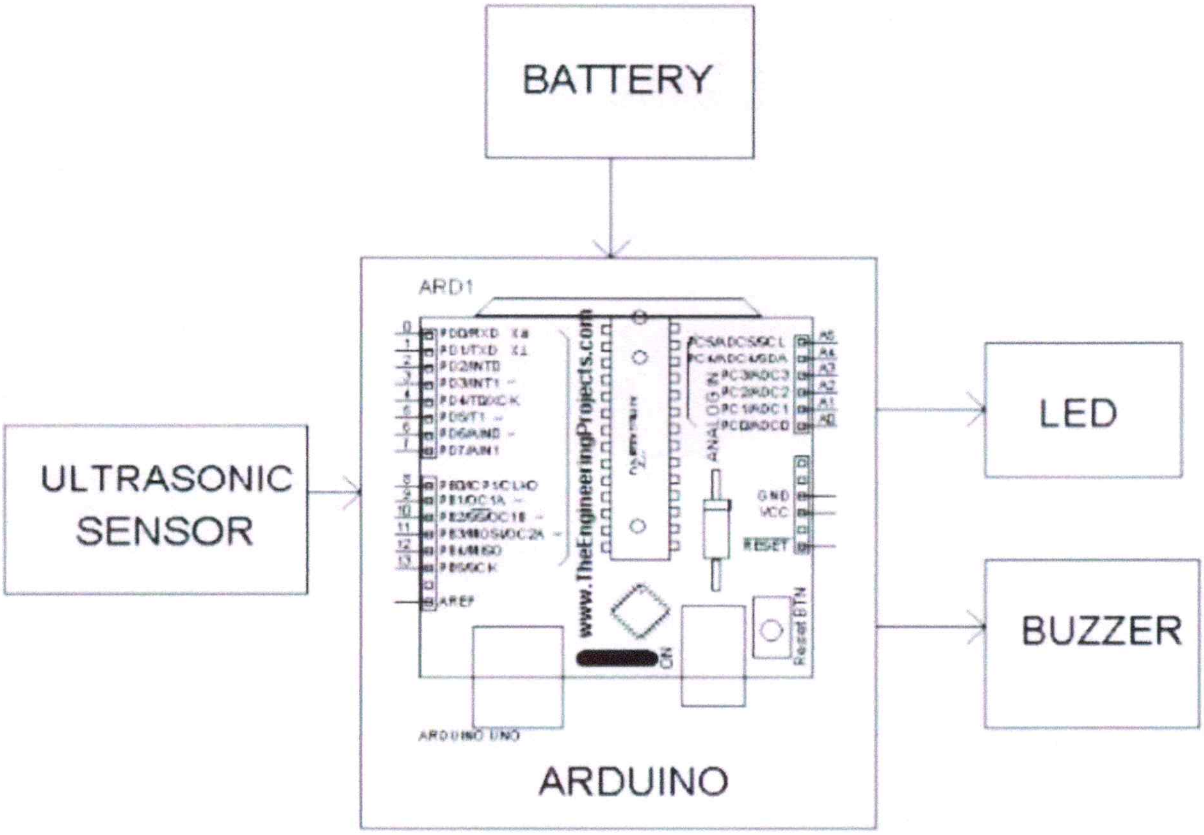
Maintenance: The system's operations starts at this stage, and major repairs can be made if necessary.

BLOCK DIAGRAM



CIRCUIT DIAGRAM

The microcontroller then processes this data and calculates if the obstacle is close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is close the microcontroller sends a signal to sound a buzzer.



EXPLAINATION OF COMPONENTS

This system the ultrasonic sensors are used to sense the obstacle (if there is any). The sensors are set a threshold limit if any obstacle is found within that range it gives beep speech through speaker. The ultrasonic sensors emit sound scopes with frequency lying in ultrasonic spectrum (>20 kHz), which is inaudible to human ears.

The sound waves hit the obstacle and bounces back to detectors. The ultrasonic sensor is used for detecting objects/obstacles which are in front. After the collection of data the calculations are done according to the formula: uS / 58 = centimeters or uS / 148 =inch. Once the distance of the obstacle is calculated then the conditions are checked. The signal is then send to microcontroller to operate a buzzer. The microcontroller reads the distance of the obstacle using sensor and also commands the buzzer. The vibrator is also connected in parallel with the buzzer for vibration sensation.

COMPONENTS

Arduino UNO

Ultrasonic sensor

9v battery

Buzzer

Vibrating motor

Switch

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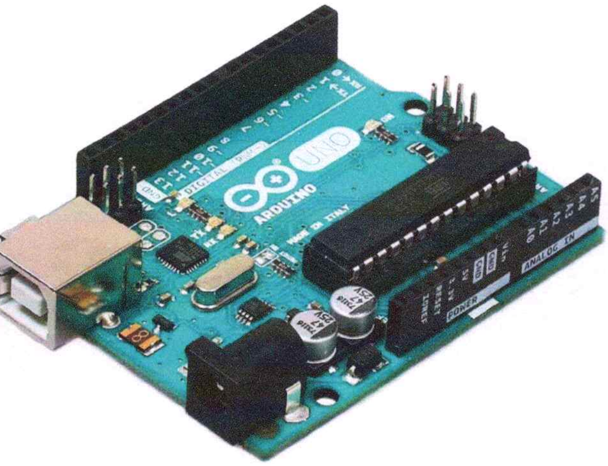
ARDUINO UNO



Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields and Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output. These boards are based on easy-to-use software and hardware. They comprise a physical programmable board known as a microcontroller and software.

Arduino UNO is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button.

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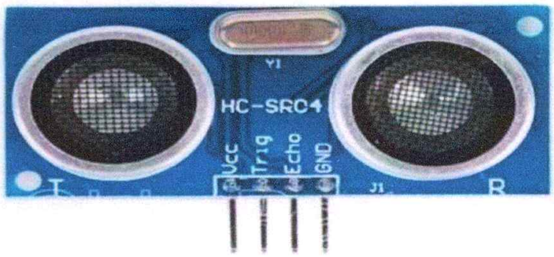
ULTRASONIC SENSOR



An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

Most ultrasonic sensors are based on the principle of measuring the propagation time of sound between send and receive (proximity switch). The barrier principle determines the distance from the sensor to the reflector (retro-reflective sensor) or to an object (through-beam sensor) in the measuring range.

PROXIMITY SWITCHES

Ultrasonic proximity switches are the simplest form of ultrasonic object detection. The transmitter and receiver are integrated in one housing. The ultrasound is reflected directly from the object to be measured to the receiver. Ultrasonic sensors with teach-in function differ from conventional types in that they offer easier and more varied operability with the simple push of a button.

Typical applications:

Distance measurement

Stack height measurement

RETRO-REFLECTIVE SENSORS

The retro-reflective sensor operates in accordance with the same principle as the ultrasonic proximity switch. Sound propagation measurement determines the distance from the sensor to the reflector or to an object in the measuring range. Any sound reflecting, stationary object can be used as the reflector.

Typical applications:

Irregularly shaped and inclined objects

Sound deflecting target objects

Sound absorbing materials such as cotton and foam rubber

THROUGH BEAM SENSORS

Ultrasonic through-beam sensors have short response times and large ranges. The transmitter and receiver are accommodated in two separate housings. The transmitter permanently emits sound waves through air to the receiver. The receiver switches through the output stage when an object interrupts the sound waves.

Typical applications:

Detection of object in fast succession

Counting objects from materials that are difficult to detect (glass containers, PET bottles)

Monitoring transparent materials

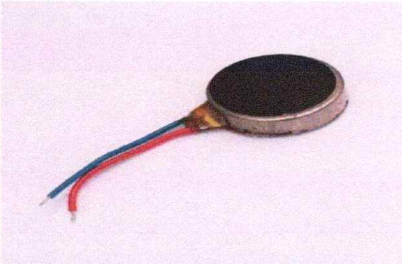
Film break monitoring

Level monitoring in tanks and silos

BUZZER

A transducer (converts electrical energy into mechanical energy) that typically operates a buzzer is in the lower portion of the audible frequency range of 20 Hz to 20 kHz. This is accomplished by converting an electric, oscillating signal in the audible range, into mechanical energy, in the form of audible waves. Buzzer is used in this research to warn the blind person against obstacle by generating sound proportional to distance from obstacle.

VIBRATING MOTOR



Vibration motor is a compact size coreless DC motor used to informs the users of receiving the signal by vibrating, no sound. Vibration motors are widely used in a variety of applications including cell phones, handsets, pagers, and so on.

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CODE

```
#define trigPin 7
#define echoPin 8
#define motor 9
#define buzzer 10
long duration, distance;
void setup()
{
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
pinMode(motor, OUTPUT);
pinMode(buzzer,OUTPUT);
Serial.begin(9600);
}
void loop()
{
digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
distance =0.017*duration;
Serial.println(distance);
if (distance <100)  // This is where checking the distance you can change the value
{
digitalWrite(motor,HIGH);   // When the distance below 100cm
digitalWrite(buzzer,HIGH);

} else
{
digitalWrite(motor,LOW);     // when greater than 100cm
digitalWrite(buzzer,LOW);
}
delay(500);}
```

RESULT

It detects reflected responses from objects irradiated with artificially generated energy sources. These kind of active sensors are capable of sensing and detecting far and near obstacles. In addition, it determines an accurate measurement of the distance between the blind and the obstacle.

It leads to good results in finding obstacles in the user's path over a distance of 70 cm. This system provides low cost, reliable, portable, low power consumption and a robust navigation solution with short clear response time.

ADVANTAGES & DISADVANTAGES

ADVANTAGES:

Both indoor and outdoor navigation are possible with the device.

Detects obstacles and notifies the blind person through vibration and buzzer.

DISADVANTAGES:

The battery must be charged.

If the stick is not charged, it will not work.

CONCLUSION AND FUTURE ENHANCEMENT

It is worth mentioning at this point that the aim of this study which is the design and implementation of a smart walking stick for the blind has been fully achieved. The Smart Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to navigate safely both indoor and outdoor. It is effective and affordable. It leads to good results in detecting the obstacles on the path of the user in a range of seventy centimeters. This system offers a low-cost, reliable, portable, low power consumption and robust solution for navigation with obvious short response time. Though the system is hard-wired with sensors and other components, it's light in weight.

Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacles. While developing such an empowering solution, visually impaired and blind people in all developing countries were on top of our priorities. The device constructed in this work is only capable of detecting obstacles and moisture. Holes cannot be detected using this device or the nature of obstacle. Therefore, a better device can be constructed using ultrasonic sensors, arduino Uno and other devices that employ audio commands to alert the user of what is in his path of movement. A vibrator may also be added for ease of use and convenience. In the future, further modifications to enhance the performance of the system will be added. These include: A global positioning method to find the position of' the user using the GPS, and GSM modules to communicate the location to a relative or care giver. It should also accommodate wide varying grips for flexible handling.

It should be noted at this stage that this work has been thoroughly carried out in order to design and implement an articulate walking bolt for the blind. The Smart Stick acts as a versatile interface for easy and comfortable internal and external mobility for visually impaired people in the next phase of more supportive apps. It's safe and affordable. This results in effective obstacle detection within three meters of the user's direction. It offers low cost, reliable, lightweight, low power and efficient navigation with fast, quick response times.

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