

**TEKNOFEST**  
**AEROSPACE AND TECHNOLOGY FESTIVAL**  
**TECHNOLOGY FOR HUMANITY COMPETITION**

**PROJECT DETAIL REPORT**

**PROJECT CATEGORY:** Social Innovation

**PROJECT NAME:** BLIND STICK

**TEAM NAME:** Tech Cats

**TEAM ID:** T3-18829-147

**TEAM LEVEL:** Primary School

**TEAM MEMBERS:**

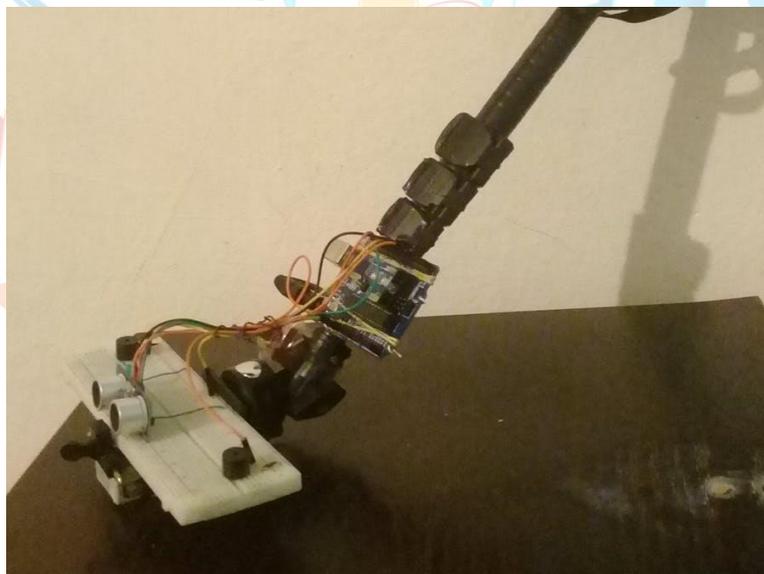
- 1. Rameen Ahmad Zubairi**
- 2. Anisha Fatima**

**ADVISOR NAME:** Ms. Shermeen Sajjad

## Project Detail Report

### 1. Project Summary:

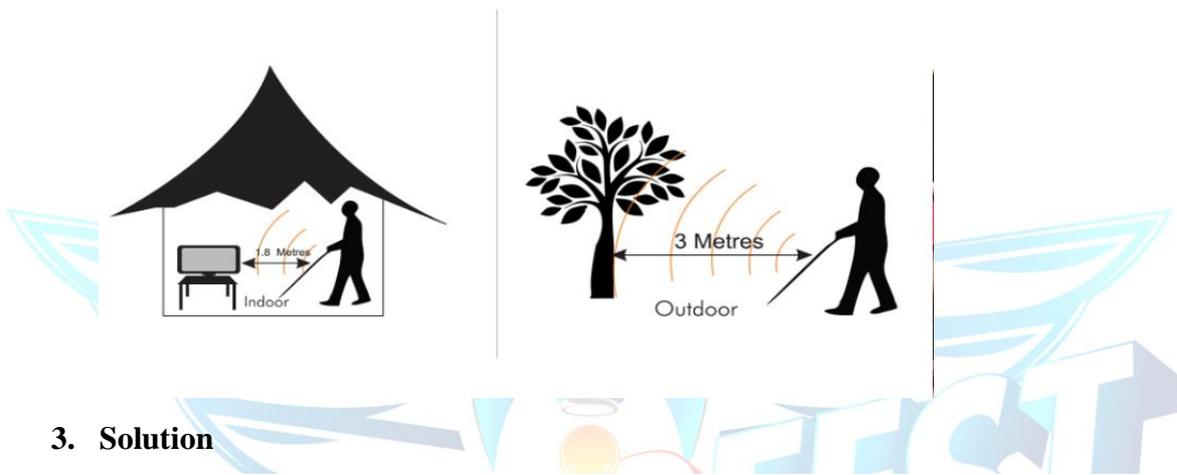
Blind people face significant challenges when navigating public spaces due to the lack of visual sensing. We present an assistive smart blind stick system, that uses an ultrasonic collision warning system to alert both the blind and the old persons by notifying how far it is from the obstacle. When it reaches the distance of 1-3 meters, the three mini speakers start to “**Beep**” and the vibration starts. It is pretty handy we don't need to drag the stick everywhere because it has 360 degree moveable tyres under it. For old people whom visual sense is weak can equally benefit from it as holds LED lights for visibility at night. The device has also got a power switch to turn the device on and off. The device has a small compartment at the bottom of the stick so if there is an issue in the circuitry or something burnt, it could open easily and be replaced with the help of instruction manual. The second benefit of this compartment is to keep all the wires in one place which will make the device aesthetically good. In that compartment there will be a battery present which is powering up the circuit that can be replaced or charged.



**Note: This is only a prototype not the real product**

## 2. Problem/ Issue:

The problem is that blind people cannot go to every place because they don't know what is going to come in front of them. Most oftenly, they bump with any obstacle or people if there is no one with them. All the current solutions are inadequate because the ones made on simple pipes are very untidy and if they fall all the circuitry will be damaged. The ones available on the websites are pretty expensive but our one is very cheap and neat and you don't even need to pick up our device or hold it in the air at lower ground because it has 4 tyres present under it.



## 3. Solution

Visually impaired people find difficulties detecting obstacles in front of them. The smart stick comes as a proposed solution to enable them to identify the world around. The stick is capable of detecting all the obstacles in range of 3 meter and gives a message empowering blind to move/turn accordingly. With the help of this stick, the person can walk twice his/her normal speed because he/she feels safe. The smart stick is of low cost, fast response, low power consumption and light weight.

## 4. Method

The **blind stick** is integrated with ultrasonic sensor along with light sensing. Our proposed project first uses ultrasonic sensor to detect obstacles ahead using ultrasonic waves. If the obstacle is close the microcontroller sends a signal to sound a buzzer. Once we are ready with our hardware, we can connect the Arduino to our Computer and start programming



## 7. Estimated cost and Project Scheduling

The estimated cost of the material required is mentioned below

Component	Price Per Unit	Quantity	Total Price
Arduino UNO	400	1	400
USB Cable	90	1	90
Buzzer	25	1	25
Vibration Motor	300	1	300
Ultrasonic Sensor	220	1	220
Connecting Wires (M-F)	15	4	60
DC Jacks (Male and Female)	35	3	105
Stick	450	1	450
9.6V Battery	500	1	500
LED	20	5	100
Push Buttons	50	1-2	100
Wheels	50	4	200
PVC pipes	100	1	100
<b>Total</b>			2650

It will cost approximately PKR 2,650 (Pakistani Rupees).



## 8. Target Group of the Project Idea (Users):

Target group of people of this project will be visually impaired people of all ages as well as old age people who are unable to maintain their body balance and need support of others. In order to make their every day work easier and reduce their dependency on others.

## 9. Risks

As the project is based on electrical devices it may encounter damages if comes in contact with water. Batteries may run out of charge while the persons are outside. There are chances that sensors go out of order or connection between wires may become loose as they are fragile.

During the implementation of project, team mates can get small electrical shocks. Due to the voltage disbalancing there are chances that few devices blew out.

- Safety measures can be taken while working on the project like wearing rubber gloves while making connections and for maintaing balance of power supplies we can use multimeter time to time. The total time estimated for production of our project is approximately one month.
- Hardware Expert
- Software Expert
- Operations and Business/Marketing Personnel

## 10. Project Team

Name Surname	Mission In The Project	School	Project or problem related experience
Rameen Ahmed Zubairi	Technical Design Report Writing Research, Assistance,	Pak Turk Maarif International Schools And Colleges, F-11 Campus, Islamabad, Pakistan	1 Year
Anisha Fatima	Conceiver, developer, programing	Pak Turk Maarif International Schools And Colleges, F-11 Campus, Islamabad , Pakistan	Nil

## 11. Resources

- [1] [https://wotipati.github.io/projects/BBeep/paper/CHI'19\\_BBeep\\_preprint.pdf](https://wotipati.github.io/projects/BBeep/paper/CHI'19_BBeep_preprint.pdf)
- [2] [https://www.google.com/search?q=blind+people+collision&sxsrf=ALeKk01AxF\\_51P-Mmot8ZT9nIgEcSfOhA:1590984149557&source=lnms&tbm=isch&sa=X&ved=2ahUKEwih8\\_o3d\\_pAhVOC2MBHcjSC-0Q\\_AUoAXoECAwQAw&biw=1366&bih=657#imgrc=-L1iUgCgQgDZTM](https://www.google.com/search?q=blind+people+collision&sxsrf=ALeKk01AxF_51P-Mmot8ZT9nIgEcSfOhA:1590984149557&source=lnms&tbm=isch&sa=X&ved=2ahUKEwih8_o3d_pAhVOC2MBHcjSC-0Q_AUoAXoECAwQAw&biw=1366&bih=657#imgrc=-L1iUgCgQgDZTM)
- [3] [https://www.researchgate.net/publication/273452928\\_Effective\\_Fast\\_Response\\_Smart\\_Stick\\_for\\_Blind\\_People](https://www.researchgate.net/publication/273452928_Effective_Fast_Response_Smart_Stick_for_Blind_People)
- [4] [https://www.researchgate.net/publication/273452928\\_Effective\\_Fast\\_Response\\_Smart\\_Stick\\_for\\_Blind\\_People](https://www.researchgate.net/publication/273452928_Effective_Fast_Response_Smart_Stick_for_Blind_People)

