

Sign In (https://www.hackster.io/users/auth/arduino?current_site=arduino&setup=true&redirect_to=%2Fprojecthub%2Fmuhammedazhar%2Fthird-eye-for-the-blind-8c246d)

Third Eye for The Blind © CC BY-NC-SA

(<http://creativecommons.org/licenses/by-nc-sa/4.0>)

An innovative wearable technology for visually impaired peoples.

innovation (/projecthub/projects/tags/innovation)

sensor (/projecthub/projects/tags/sensor)

[smart appliances \(/projecthub/projects/tags/smart+appliances\)](/projecthub/projects/tags/smart+appliances)

[social \(/projecthub/projects/tags/social\)](/projecthub/projects/tags/social)

[wearables \(/projecthub/projects/tags/wearables\)](/projecthub/projects/tags/wearables)

18,091 VIEWS 16 COMMENTS 46 RESPECTS

COMPONENTS AND SUPPLIES

^



SparkFun Arc
</buy/64?s=B>

[\(/projecthub/products
/buy/64?s=BAhJlhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A\)](/projecthub/products/buy/64?s=BAhJlhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A)

5 Ultrasonic :
</buy/21468?>

Perfboard (/p
/buy/21469?i

Vibrating mo
/buy/21471?s



Buzzer (/proj
/buy/275?s=

(/projecthub/products
/buy/275?s=BAhJIhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A)



5 mm LED: R
</buy/334?s=BAhJIhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A>

(/projecthub/products
</buy/334?s=BAhJIhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A>)



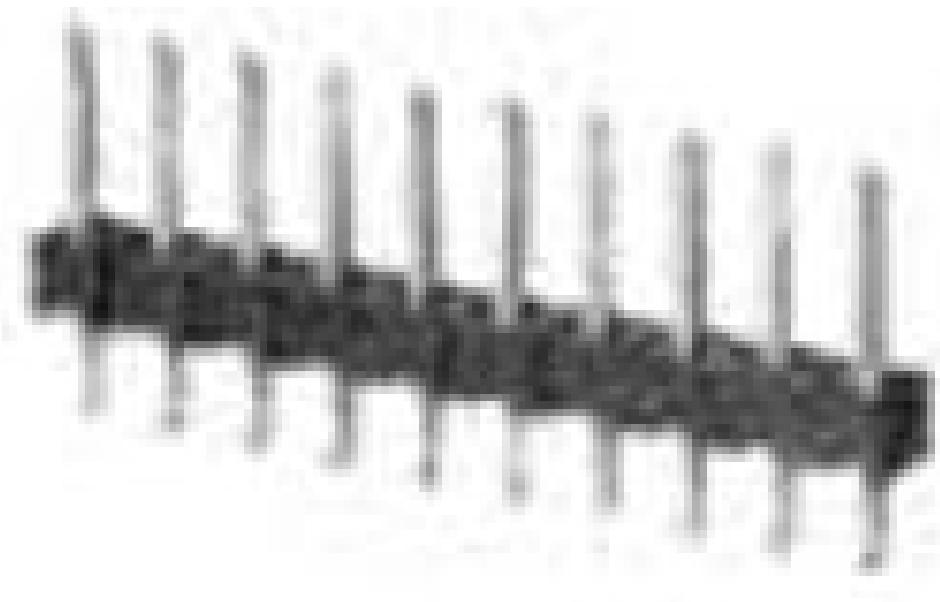
Slide Switch
[/buy/391?source_id=1](https://projecthub.io/projects/buy/391?source_id=1)

(/projecthub/products
[/buy/391?source_id=1](https://projecthub.io/projects/buy/391?source_id=1))



Female Head
[/buy/321?s=f](https://projecthub.io/projects/buy/321?s=f)

(/projecthub/products
[/buy/321?s=BAhJIhY0NDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A](https://projecthub.io/projects/buy/321?s=BAhJIhY0NDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A))



Male Header
[/buy/317?s=E](#)

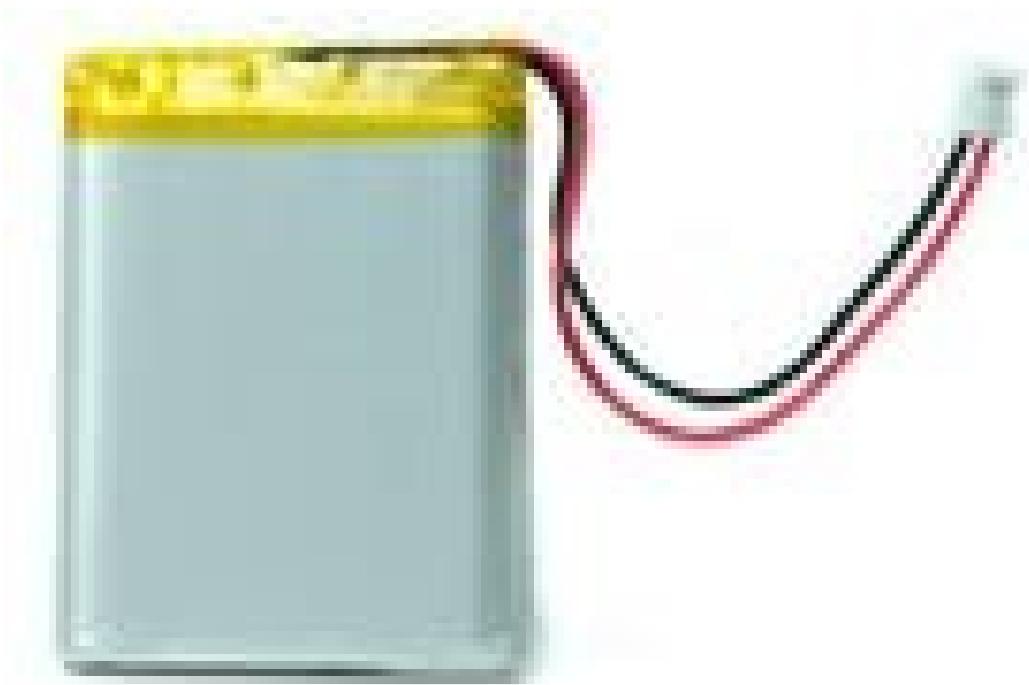
(/projecthub/products
[/buy/317?s=BAhJIhY0NDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A](#))



Jumper wires
</buy/45?s=B>

(/projecthub/products
</buy/45?s=BAhJlhYONDA0MCxCYXNIQXJ0aWNsZQY6BkVG%0A>)

Power bank (
</buy/21472?>



C.H.I.P. Approach
[/buy/19126?source=CHIP](https://projecthub/products/buy/19126?source=CHIP)

(/projecthub/products
[/buy/19126?source=CHIP](https://projecthub/products/buy/19126?source=CHIP))

Some elastics
(to make it as a belt)

NECESSARY TOOLS AND MACHINES



Soldering iron (generic)

^



Hot glue gun (generic)

APPS AND ONLINE SERVICES ^

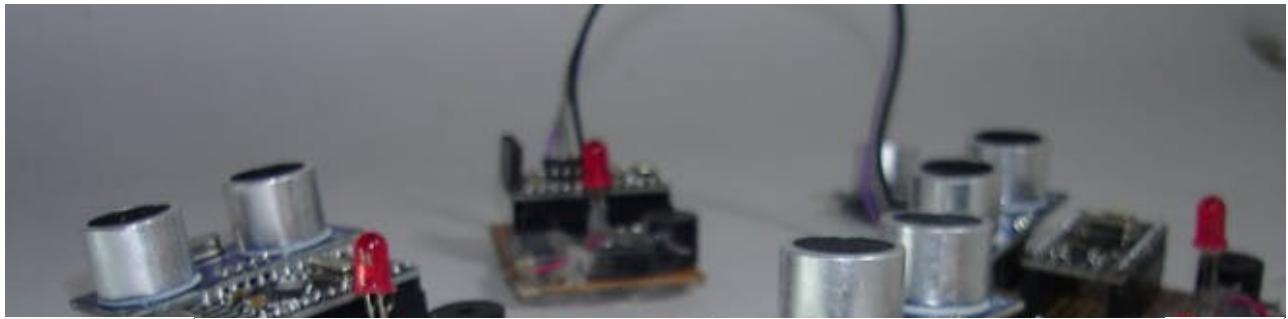


Arduino IDE
(<https://www.arduino.cc/en/main/software>)

Arduino IDE
(<https://www.arduino.cc/en/main/software>)

(<https://www.arduino.cc/en/main/software>)

ABOUT THIS PROJECT ^



< PREVIOUS

NEXT >

- **The first wearable technology for blinds**
- **Using ultrasonic waves to detect the obstacles**
- **Notifying the user through vibrations/buzzer sound**

Third eye for blinds is an innovation which helps the blinds people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration. They only need to wear this device as a band or cloth.

According to WHO 39 million peoples are estimated as blinds worldwide. They are suffering a lot of harder ship in there daily life. The affected ones have been using the traditional white cane for many years which although being effective, still has a lot of disadvantages. Another way is, having a pet animal such as a dog, but it is really expensive. So the aim of the project is to develop a cheap and more efficient way to help visually impaired to navigate with greater comfort, speed and confidence.

Watch the video of it's working.



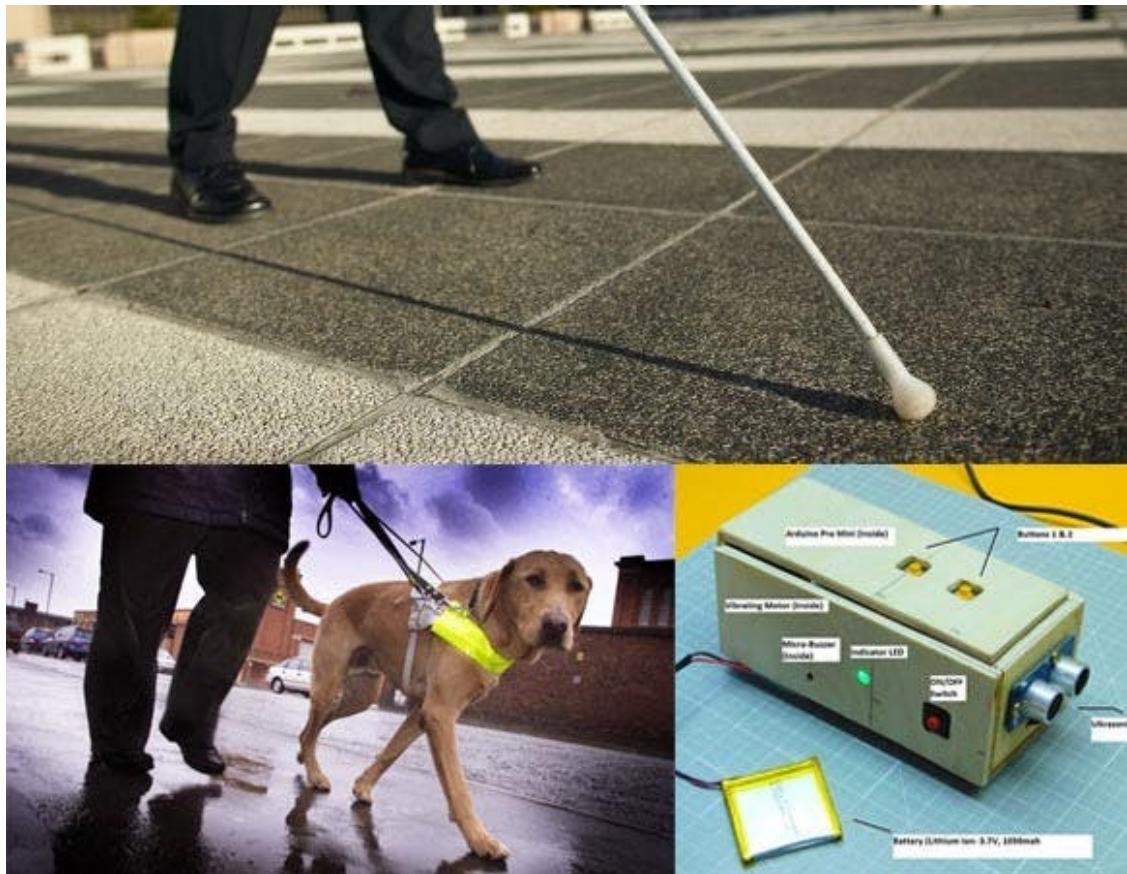
Watch the video that came in a news channel (Malayalam language)



Novelty of the project : This is the first wearable technology for blinds which resolves all the problems of existing technologies. Now a days there are so many instruments and smart devices for visually impaired peoples for

navigation but most of them have certain problems for carrying and the major drawbacks is those need a lot of training to use. The one of the main peculiarity of this innovation is, it is affordable for everyone, the total cost being less than \$25 (~1500INR). There are no such devices available in the market that can be worn like a cloth and having such a low cost and simplicity. When used on a large scale, with improvements in the prototype, it will drastically benefit the community.

Step 1: Existing Systems



- 1.White cane
- 2.Pet dog
- 3.Smart devices (eg : Vision a torch for blinds)

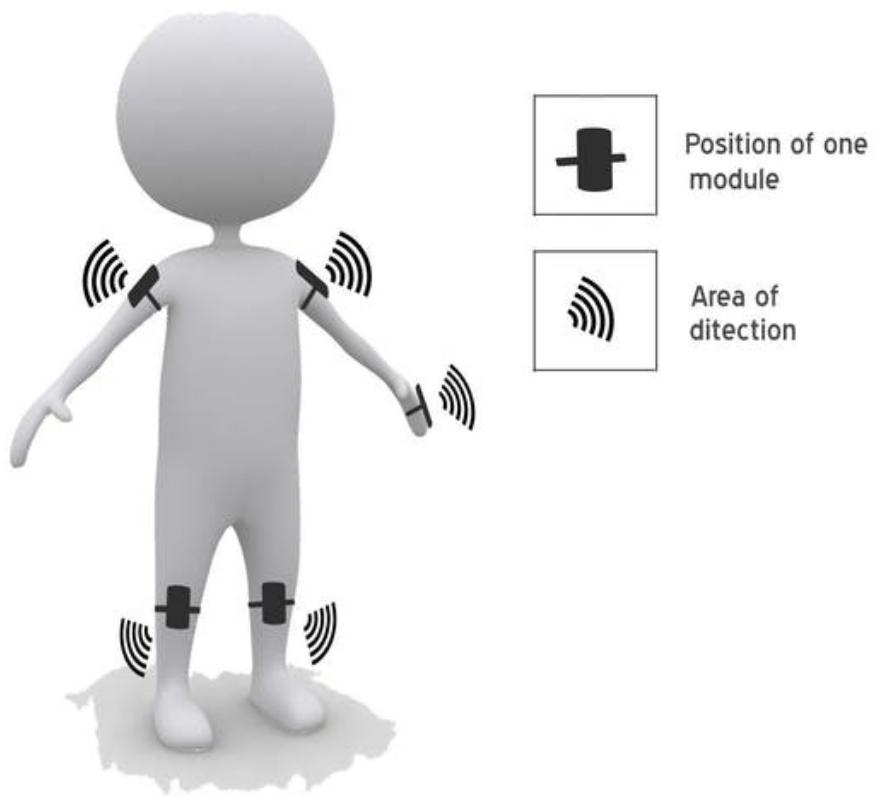
Problem of the Existing Systems:

* White cane - May easily crack/break, The stick may get stuck at pavement cracks of different objects.

- * Pet dog - Huge cost. (~\$42,000 / 280000Rs)
- * Common Disadvantages (Including the the smart devices) **Cannot be carried easily**, needs a lot of training to use...

The features of Third eye for blinds: By wearing this device they can fully avoid the use of white cane and such other devices. This device will help the blind to navigate without holding a stick which is a bit annoying for them. They can simply wear it as a band or cloth and it can function very accurately and they only need a very little training to use it.

Step 2: Full Description of the Project



◀ PREVIOUS

• •

NEXT ▶

I have designed a special wearable device based on the arduino board which can be worn like a cloth for blinds. This device is equipped with five ultrasonic sensors, consisting of five modules which are connected to the different parts of the body. Among them, two for both shoulder, another two for both knees and one for the hand. Using the five ultrasonic sensors, blind can detect the objects in a five dimensional view around them and can easily travel anywhere. When the ultrasonic sensor detects obstacle the device will notify the user.

through vibrations and sound beeps. The intensity of vibration and rate of beeping increases with decrease in distance and this is a fully automated device.

Feature improvements :

The entire project can be made in the form of jacket, so that the device doesn't need to be wear one by one. Use of specially designed boards instead of arduino and high quality ultrasonic sensors makes faster response which make the device capable of working in crowded.

Step 3: Tested Successfully With the Help of a Visually Impaired Person.

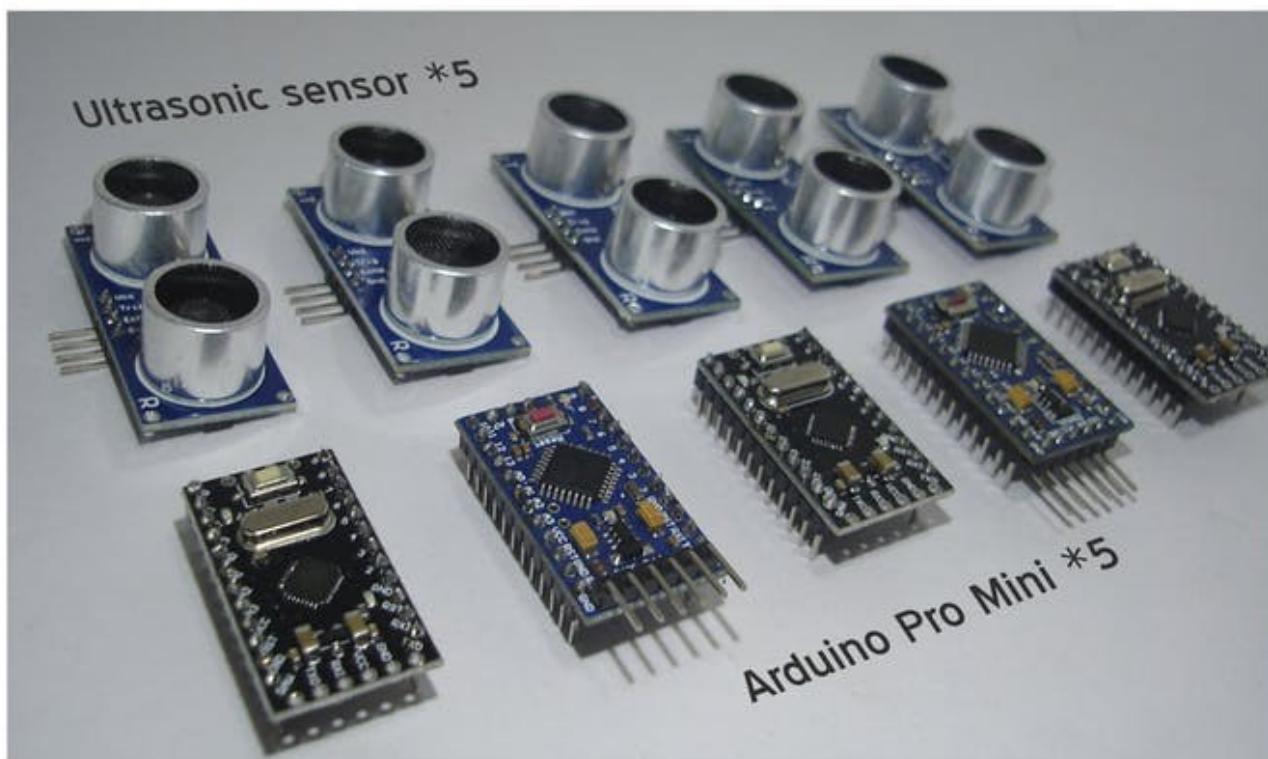
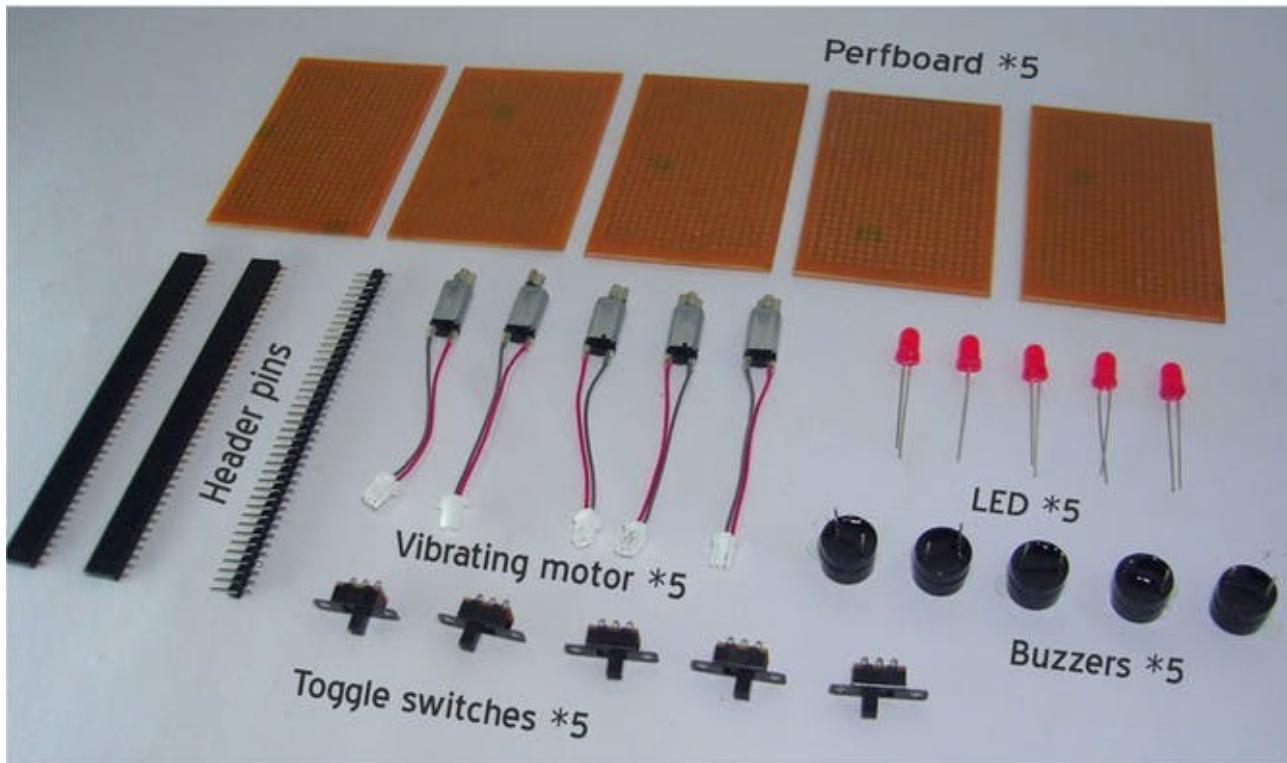


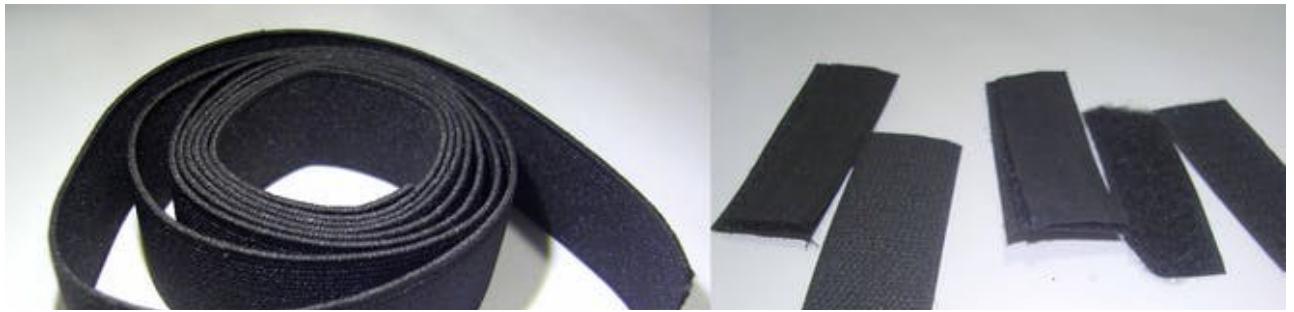
Read more about this here in the FB post (<https://www.facebook.com/pyari.lal.9/posts/1309514952459267>) by our school science teacher.

Awards won for this innovation.

- 1st price for PPT innovation award (<http://pptinnovationawards.in/>)
- 2nd price in state level science fair. (Conducted by Government of Kerala)

Step 4: Prototyping of the Idea - Parts Used

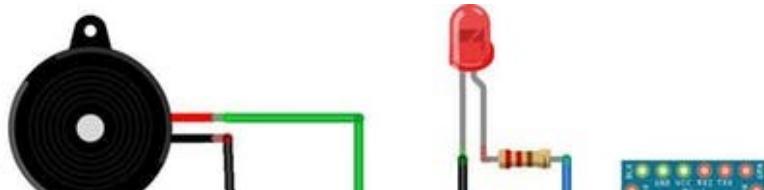




Materials

- 5 x Arduino pro mini
- 5 x Ultrasonic sensor
- 5 x Pref board
- 5 x Vibrating motor
- 5 x Buzzers
- 5 x Red LEDs
- 5 x Switches
- Male and female header pins
- 4 x Jumper cable
- One power bank
- One 3.3 volt old mobile battery
- Some elastics and stickers(to make it as a band for wearing)

Step 5: Circuit Diagram



[◀ PREVIOUS](#)

[NEXT ▶](#)

Wiring instruction.

Ground of LED, buzzer and vibration motor to GND of arduino

+ve of LED and middle leg of switch to Arduino pin 5

+ve of Buzzer to first leg of switch

+ve of Vibration motor to third leg of switch

Ultrasonic sensor

Ultrasonic sensor pin VCC - Arduino pin VCC

Ultrasonic sensor pin GND - Arduino pin GND

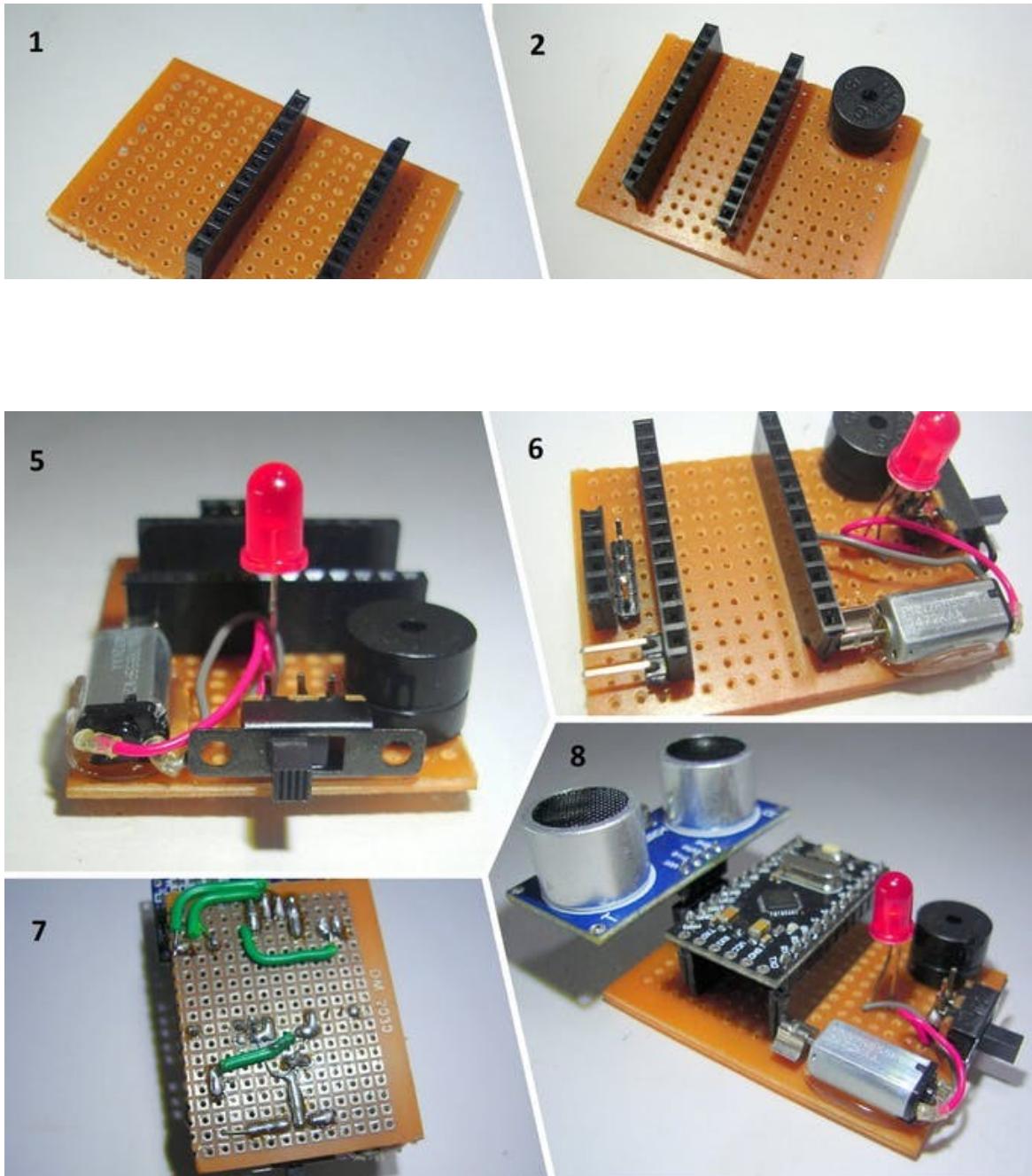
Ultrasonic sensor pin Trig - Arduino pin 12

Ultrasonic sensor pin Echo - Arduino PIN 12

The switch used here is for selecting the mode. (buzzer or vibration mode.)

Figure 2 - Powering the modules - Connect the 4 arduino pro mini to a USB male pin and connect to a power bank. For the module in the hand use a small lithium battery.

Step 6: Making the Modules



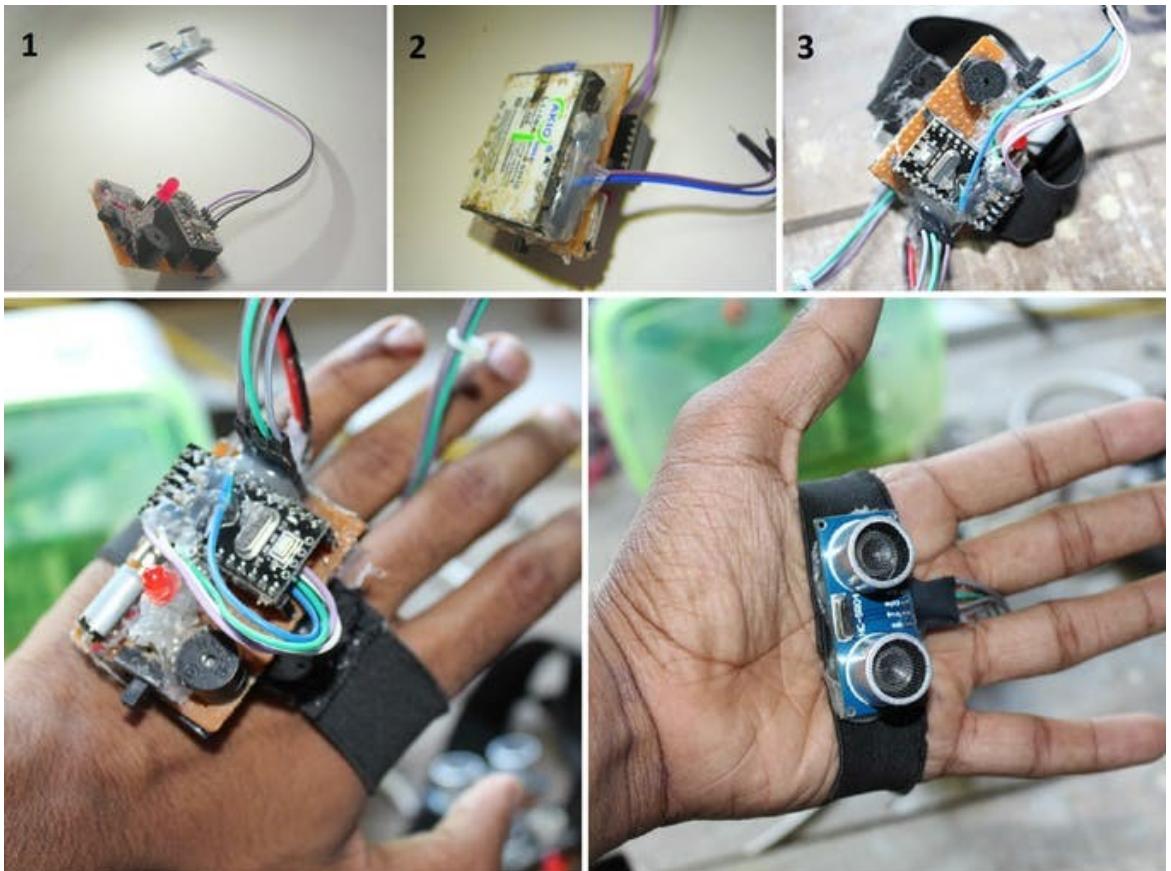
1. First cut the pref board in 5 X 3 cm dimension and solder the female headers for the arduino to the board.
2. Then solder the buzzer.
3. Then connect the vibrating motor using the glue gun and solder wires to it.
4. Then connect the LED.
5. Then connect the switch.
6. Then connect header pins for ultrasonic sensors and for battery input.
7. Then solder everything as shown in the circuit diagram.

8. Now connect the arduino and ultrasonic sensor to the board

Also connect the elastic band to all the modules.

3 more modules are to be made in the same way us described above, but for the one in the hand, there is a little difference. visit the next step before making that last module.

Step 7: Code + Making the Module for the Hand



1. Connect the ultrasonic sensor to the board by using 4 jumper cables.

2. Then connect a 3.7 volt mobile battery to this module.

3. Then connect the elastic band as shown in the figure.

At last upload the code to each arduino board and power the 4 other modules using a power bank.

Code used in the arduino -

```
//VISIT : www.robotechmaker.com
const int pingTrigPin = 12; //Trigger connected to PIN 7
const int pingEchoPin = 10; //Echo connected yo PIN 8
int buz=5; //Buzzer to PIN 4
void setup() {
Serial.begin(9600);
pinMode(buz, OUTPUT);
}
void loop()
{
long duration, cm;
pinMode(pingTrigPin, OUTPUT);
digitalWrite(pingTrigPin, LOW);
delayMicroseconds(2);
digitalWrite(pingTrigPin, HIGH);
delayMicroseconds(5);
digitalWrite(pingTrigPin, LOW);
pinMode(pingEchoPin, INPUT);
duration = pulseIn(pingEchoPin, HIGH);
cm = microsecondsToCentimeters(duration).
```



THIRD_EYE_FOR_BLINDS.INO

([HTTPS://HALCKEMY.S3.AMAZONAWS.COM/UPLOADS/ATTACHMENTS/315262/THIRD_EYE_FOR_BLINDS.INO](https://HALCKEMY.S3.AMAZONAWS.COM/UPLOADS/ATTACHMENTS/315262/THIRD_EYE_FOR_BLINDS.INO))

CODE

^

Code used in the arduino C/C++



(/PROJECTHUB/CODE_FILES/120727/DOWNLOAD)



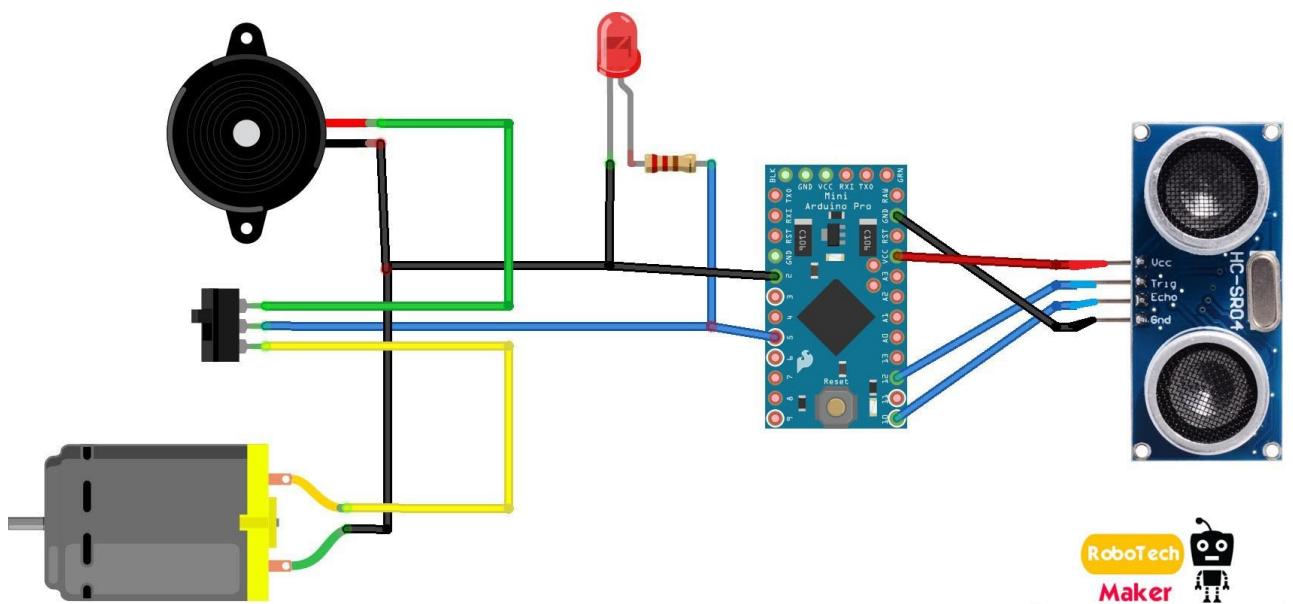
//VISIT : www.robotechmaker.com

```
const int pingTrigPin = 12; //Trigger connected to PIN 7
const int pingEchoPin = 10; //Echo connected yo PIN 8
int buz=5; //Buzzer to PIN 4
void setup() {
Serial.begin(9600);
pinMode(buz, OUTPUT);
}
void loop()
{
long duration, cm;
pinMode(pingTrigPin, OUTPUT);
```

SCHEMATICS

Circuit diagram 1

[DOWNLOAD \(HTTPS://HALCKEMY.S3.AMAZONAWS.COM/UPLOADS/ATTACHMENTS/31\)](https://halckemy.s3.amazonaws.com/uploads/attachments/31)



RobotTech
Maker
robotechmaker.com

COMMENTS

Please log in (/projecthub/users/sign_in?id=44040&m=base_article&reason=comment&redirect_to=%2Fprojecthub%2Fmuhammedazhar%2Fthird-

eye-for-the-blind-8c246d%23comments) or sign up (/projecthub/users /sign_up?id=44040&m=base_article&reason=comment& redirect_to=%2Fprojecthub%2Fmuhammedazhar%2Fthird-eye-for-the-blind-8c246d%23comments&source=popup) to comment.



IPattorney (/projecthub/IPattorney)

10 months ago

(/pr
ject
Well done!

hub

/IPat

torn

ey)



Muhammed Azhar (/projecthub/muhammedazhar)

10 months ago

(/pr
ject
Thank you!

hub

/mu

ham



Deleted account

10 months ago

r)

Very cool project! I think this could really help people, especially ones who can't afford a dog or other expensive devices. I can see, but I think I might build one of these anyway just to try it!



AlexskYe (/projecthub/alexskye22)

10 months ago

(/pr
ject
Can i use Arduino Uno r3 for this project.?

hub

/alex

skye

22)



Muhammed Azhar (/projecthub/muhammedazhar)

10 months ago

(/pr
ject
Yes, but the size of the each nodes becomes large and then it can't be

easily worn.

hub

/mu

ham



AlexskYe (/projecthub/alexskye22)

10 months ago

(/pr
objec

is the connection in pin of arduino micro is the same in arduino uno r3?

hub

/alex

skye



Muhammed Azhar (/projecthub/muhammedazhar)

10 months ago

(/pr
Yes
ject

hub

/mu

ham

/rohit

chauhan (/projecthub/rohit-chauhan)

8 months ago

(/pr
r)
ject

well done! great project

can i do it with single Arduino by use I2C protocol

hub

/rohi

t-

chau

han)



Muhammed Azhar (/projecthub/muhammedazhar)

8 months ago

(/pr
Yeah
ject

hub

/mu

ham

/rohit

Keerthana_RO (/projecthub/Keerthana_RO)

8 months ago

(/pr
r)
ject

I am new to arduino. I keep getting the following error.

hub

Sketch uses 2712 bytes (9%) of program storage space. Maximum is 28672 bytes.

the

Global variables use 190 bytes (9%) of dynamic memory, leaving 1858 bytes for local variables. Maximum is 2048 bytes.

RO)

Can you please help as soon as possible?



Prabhsimar_Singh (/projecthub/Prabhsimar_Singh)

8 months ago

(/pr
ject
hub

/Pra
bhs
mar



neerajmanus2004 (/projecthub/neerajmanus2004)

(/pr
ject
hub

/nee
rajm



MoonMoon88 (/projecthub/MoonMoon88)

(/pr
ject
hub

Hey I am new to arduino. I am using a jsn sr40t as my sensor for this project
but i kept on receiving inconsistent measurements of distance, is the problem
on the sensor or on the code? Thank you



praneeth41997 (/projecthub/praneeth41997)

(/pr
ject
hub

Please explain me how to connect power supply to components on board and
how to interconnect all those arduino boards with a single power supply.

/pra
neet
h419



Azizurrahman (/projecthub/Azizurrahman)

(/pr
ject
hub

If there a bay in front of his way ,for this which of the sensor we will use?
/Azi
zurr
ahm
an

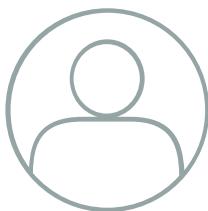


rawadmrad (/projecthub/rawadmrad)

(/pr
ject

can you provide me the prototype? or can I Buy it
I am really interested to by this prototype my mail is rawad.93@outlook.com
(mailto:rawad.93@outlook.com)

AUTHOR



(/projecthub/muhammedazhar)

Muhammed Azhar (/projecthub/muhammedazhar)

3 PROJECTS

FOLLOW (/PROJECTHUB/USERS/SIGN_UP?ID=90437&M=USER&REASON=FOLLOW)

PUBLISHED ON

June 17, 2017

RESPECT PROJECT (/PROJECTHUB/USERS/SIGN_UP?ID=44040&M=ARTICLE&REASON=RESPECT&REI

 GIVE FEEDBACK

 Share

↪ I made one (/projecthub/users/sign_up?id=44040&m=base_article&reason=follow&redirec

MEMBERS WHO RESPECT THIS PROJECT

 ([/projecthub/Annlee_Fores](#)) ([/projecthub/saif1996](#)) ([/projecthub/Richal](#))

(/projecthub/Amritaparna) (/projecthub/sucheta-panda) (/projecthub/sga)

(/projecthub/paulo-yvez-tolentino) (/projecthub/par-olof-funck)

and 38 others

and 38 others

**SEE SIMILAR PROJECTS
YOU MIGHT LIKE**

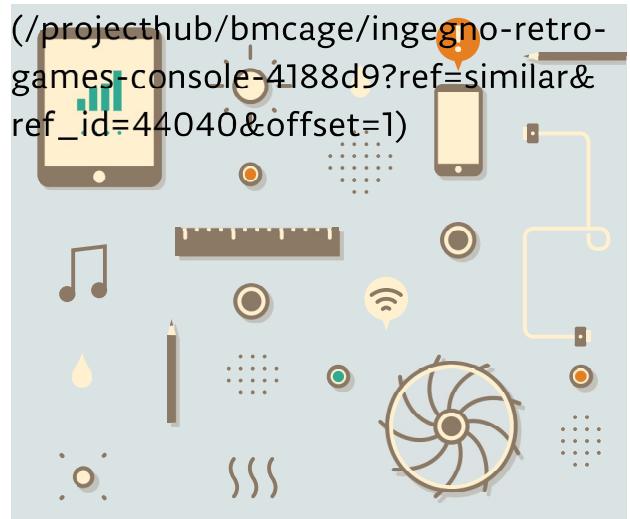
SIMILAR PROJECTS YOU MIGHT LIKE



Arduino Tutorial: JARVIS v1 | How to make a Home

Project tutorial by **rahulkhanna** ([/projecthub/rahulkhanna](#))

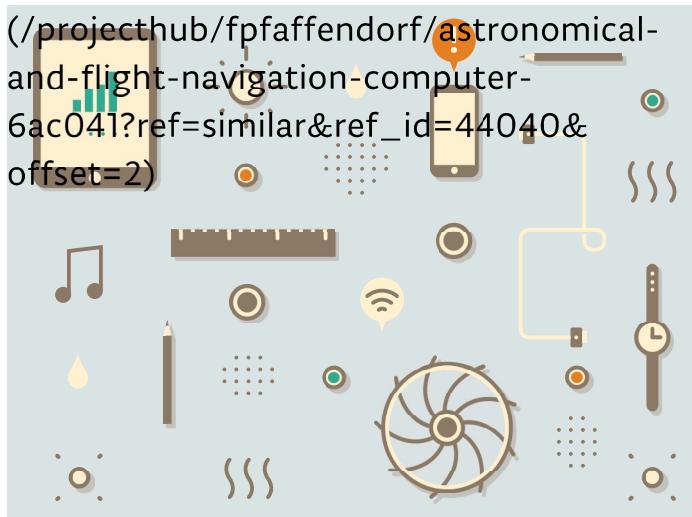
4,105 VIEWS 7 COMMENTS 32 RESPECTS



Ingegno Retro Games Console ([/projecthub/bmcage](#))

Project tutorial by **bmcage** ([/projecthub/bmcage](#))

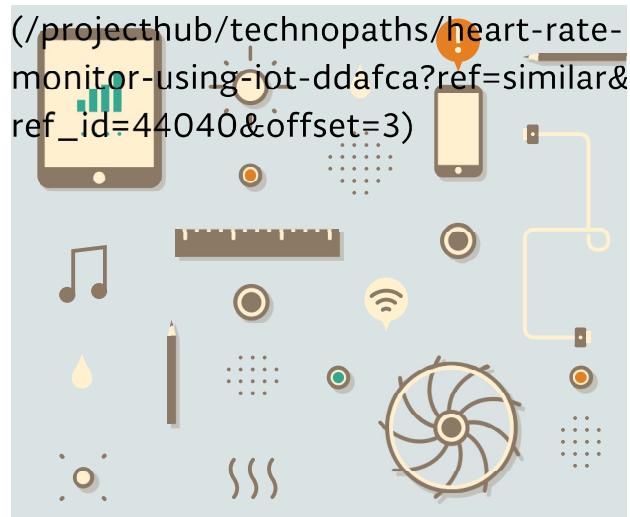
748 VIEWS 1 COMMENT 7 RESPECTS



Astronomical and Flight Navigation Computer

by **fppfaffendorf** ([/projecthub/fppfaffendorf](#))

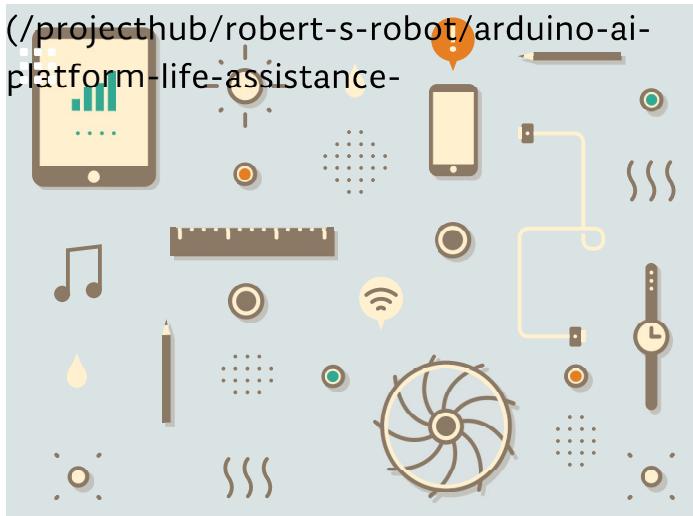
1,496 VIEWS 0 COMMENTS 5 RESPECTS



Heart Rate Monitor Using IOT ([/projecthub/technopaths](#))

Project tutorial by **Technopaths** ([/projecthub/technopaths](#))

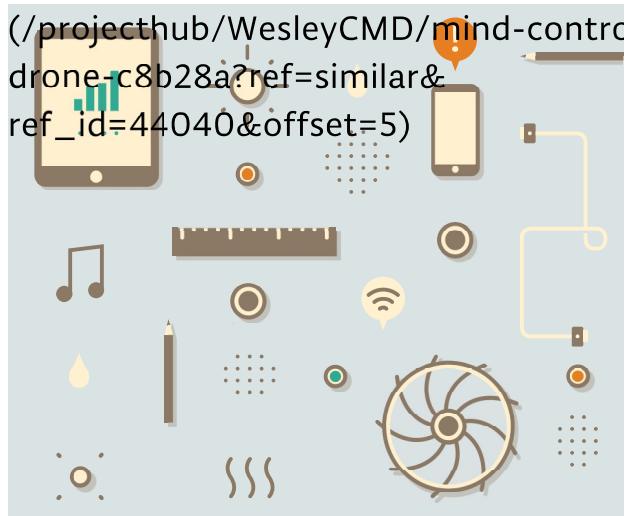
3,257 VIEWS 1 COMMENT 16 RESPECTS



Arduino AI platform -- life assistance (/projecthub)

Project in progress by **Robert's Robot** (...)

1,888 VIEWS 2 COMMENTS 7 RESPECTS



Mind Control Drone (/projecthub/WesleyCMD)

Project tutorial by **WesleyCMD** (/projec...

16,186 VIEWS 10 COMMENTS 68 RESPECTS