National Institute of Technology, Hamirpur (H.P.)

Innovative Research Incubation Club

Innovation Research Project Proposal

Applicants :

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Project title :

"Touch based navigation system for optically challenged people"

Project description :

- The project consists of two wearable units - 1 glove unit and 1 belt unit
- The belt is the unit having sensors to gauge the surrounding objects.
- The glove is used to give the wearer information about surroundings by touch/movement.
- As a set they help optically challenged people to navigate and move independently.

An abstract has been attached giving proper details of the project.

Project completion time :

8 weeks

Approximate cost :

6 thousand INR

Student skills required :

- Programming in C or C++
- Working on Arduino and Arduino IDE.
- Proper electrical and electronics knowledge.
- A keen and innovative mind.

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Innovation Research Project Abstract

Objective

- To develop a prototype device capable of aiding optically challenged people to navigate independently.

Background

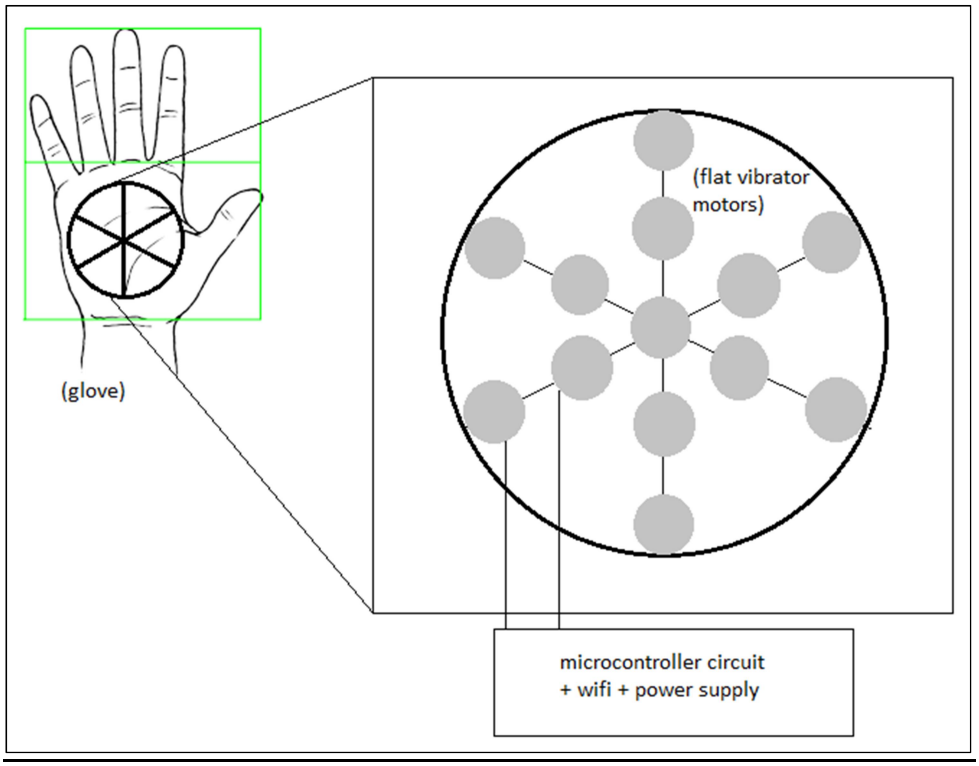
- Life itself is a challenge for visually impaired people especially in countries like India. The project aims to bring changes and opportunities in their lives.

Project details

The project has two parts

- The glove with motion units to help in navigation.
- The belt with sensor array to detect surroundings.

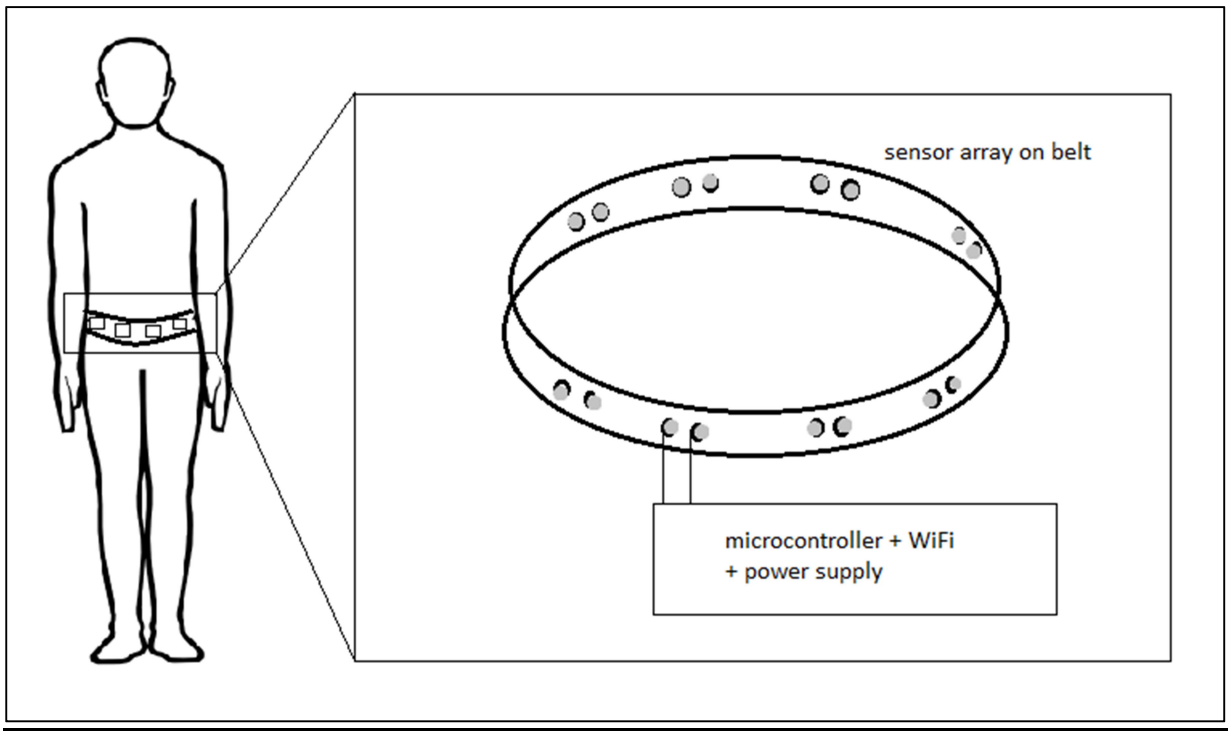
The glove unit



- The glove has an array of flat face vibrator motors which act as the 2d plane with the user at the centre.

- Depending on the position of objects in the surroundings, the motors will turn on.
- This will give the user the position of the object or obstacle with respect to him.
- If motors turn on in the order of coming towards the centre, the object is moving closer.
- If motors turn on in the order of moving away from the centre, the object is moving closer.

The Belt unit



- It contains 6 distance sensor.
- Each sensor is placed at 60° angle.
- Depending on the position of objects in the surroundings, particular ultrasonic sensor will measure the distance from the body.
- Each ultrasonic sensor is connected to the vibrator motor of glove unit through wifi.

Problem addressed

People with complete blindness often have a difficult time self-navigating outside well-known environments. In fact, physical movement is one of the biggest challenges for blind people, explains World Access for the Blind. Traveling or simply walking down a crowded street may pose great difficulty. Because of this, many people with low vision will bring a sighted friend or family member to help navigate unknown environments.

Approximate cost and components

Sl. No.	Part	No of units	Cost
1	Vibratory motor	15	750
2	Adruino(Nano)	2	1200
3	Glove	1	150
4	Wi-Fi Module	2	500
5	Ultrasonic Sensor	6	1800
6	Belt	1	150
7	LiPo Battery	2	1450
	TOTAL		6000