

Innovation and Creative Thinking workshop 3 – 5 Aug 2018

Project Brainstorming and Discussions

Activity Sheet: One sheet for each team of 5 people for the project

Fill 1, 2, 3 before Day 2 morning for Brainstorming. Go through the remaining questions and start thinking. Open mind and nimble fingers Required!!

When you finish this doc upload before **20 Aug 2018**

1. Project code and team number: CIP2018_08/01(for eg. CIP201807/14)
2. Name of Project Senior: citizen or patient fall monitoring device.
3. Name of Team members and specify who is your leader(for communication and co-ordination)
 - a) Leader: Ashawini Ganesh Hiwarale
 - b)Rajath R
 - c)Abdullah Khan
 - d)Namdev
 - e)Aswin Krishna B

4. What is the essence of this problem statement?

Ans: Senior citizen falling down can be really dangerous. They have fragile bones and weak body. The movement of their muscles is restricted. If they fall all of a sudden it may lead to major injuries.If not cured then and there it can result into death also.

5. What are the facts you have gathered for this problem?

Ans: The patient is physically weak . The device to be connected will either be attached around the person's waist or at the centre point of the body. The device will start to make an alertbaound when the patient is about to fall and the inclination is greater than 30 degree.

6. What are your assumptions?

Ans: The person maybe aged or is a patient. They find it difficult to move. The patient is in such an environment where we can have people for immidiate help. The buzzer will start if the patient is trying to do some hard or tiring physical activity.

7. Are there any assumptions which can be invalid for any condition?

Ans: Senior citizen may find it hard to wear the device. It may be uncomfortable for the person.

8. What solution ideas have you come up with?

- a) We can make use of tilt sensor. Based on its principle we can create something

- b) We can make a direct circuit with breadboard or Arduino (if allowed) in which the movement of the patient shows an alert.
- c) we can use water as a reference in a hemispherical shell to measure the tilt of the body.

9. What are the positive aspects of each of the ideas?

a) By the usage of tilt sensor the device can detect the fall of the person to any direction if its above 30 degree.

b) We will get a more efficient device if we use Arduino or breadboard as the base circuit board.

10. What are the fallbacks or concerns you envisage in each of the ideas?

a) inaccurate (can trigger buzzer in general walking)

b) big in size, slightly impractical.

11. What new solutions have you come up with for overcoming these concerns?

a) we can use tilt sensors available in the market to improve accuracy.

b) we can use gyroscope to establish a reference line.

c) we can take advantage of our phone's accelerometer and gyro-sensor not only to improve accuracy but also to increase usability.

12. What final idea have you decided on? Explain with drawing/rough sketch if possible.

We have decided to make a monitoring device with the help of a hemispherical ball filled partially with an electrolyte solution. As the patient bends or falls 30 degree then the electrolyte solution gets tilted and touches both the metal plates and finishes the circuit. As the circuit is completed the buzzer sound is produced.

The electrolytic solution will be a salt solution. A common salt solution but more viscous than normal, yet to be figured out how.

The hemispherical ball will be fixed using a 3D printed mount which would be attached to a belt around person's waist (near person's centre of mass to reduce rotation effects of motion).

The circuit will be fixed on belt. It would be made on bread board.