INSTITUTE TECHNICAL SUMMER PROJECT 2016-17

PROJECT TITLE: SPYING BALL

TEAM NAME: GUESS WHO?

TEAM MEMBERS:

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- INTRODUCTION: We intend to build a spying equipment, which looks like a ball. The Ball's rolling motion can be controlled using the
- app[there are already many open source android apps developed for rasp pi for every use.]
- And we can spy using the usb webcam which can be viewed on the app.

- THEORY OF IMPLEMENTATION:
- The ball will move with the help of motors. We will mimic the motion created in "cubli".
- Motors will rotate blades that will create torque and would move ball.
- One for forward motion and another for left or right motion. While the ball is in forward motion the camera will be stabilized using accelerometer and gyroscope sensors.
- Motion will also controlled through app.
- We will be combining open source app for rasp pi to make our own app.
- steady video will be streamed to app. The app will communicate with the ball using wifi hotspot from rasp pi or even available wifi networks.

- WHAT WE WILL LEARN FROM THIS PROJECT:
  1. ANDROID APP DEVELOPMENT
  2. PYTHON
  3. RASPBERRY PI
  4. USAGE OF ACCELEROMETER AND GYROSCOPE (IC INTERFACE)
  5. ROTATIONAL MECHANICS

➢ EQUIPMENTS REQUIRED (with Cost):

1. Arm development board having camera interface. we are using Raspberry pi 2 (Rs-3000) .Recommended (raspberry pi zero)
2. 12v battery(Rs-1000)
3. Class 10 SD card at least 8gb(Rs-300)
4. Usb webcam (Rs. 1000)
5. Gyro + accelerometer module for arm, around 5(Rs5*300)
6. 3D modeled Framework (Rs. 1000)
7. Servo Motors around -2 (Rs. 2000)
8. Wires and other things(500)
9. Raspberry pi wifi module(300)

Total approximate cost of the project will be 10000-12000 Rs.

➢ EXECUTION STRATEGY:

- Week 1: We will focus on learning python raspberry pi and how to use sensors with raspberry pi.
- Week 2 and 3: We will try and form the basic mechanical model.
- Week 3: Assemble sensors to framework and develop required python programs for mechanical control.
- Week 4: Testing ball motion with available open source apps and debugging.
- Week 5: if testing is complete Learning android app development with Python.
- Else use available apps and modify code suitable for camera usage during motion .
- Week 6: Assembling the webcam and overall testing.

➢ REFERENCES:

1. http://robohub.org/swiss-robots-cubli-a-cube-that-can-jump-up-balance-and-walk-across-your-desk/
2. https://www.raspberrypi.org/