# BIBO

# GROUP DETAILS...

Group Name: The Think Tank

Preferred slot: Slot 1


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# ABSTRACT...

Through our ITSP 2015 project we aim to develop a biped robot. We aim to get taste of the exponentially expanding field robotics, this being our first step in this direction through opportunity provided by STAB.

# INTRODUCTION...

The robot is capable of walking, waving hand and some more actions. The robot is completely remote controlled in its initial phase and may be transformed into wireless controlled or Smartphone controlled in future.

# COMPONENTS REQUIRED...

Servo motors, Arduino board, microphone, mechanix kit, Webcam, basic electronic components, basic tools, Accelerometer, Gyroscope, Bluetooth sensor, remote.

# WORKSHOPS REQUIRED...

1. Biped robot Basics sessions
2. Arduino Sessions
3. Robotics locomotion sessions
4. (Image and sound Processing so that we can implement some aspects of it in our project if time permits)

# IMPLEMENTATION STEPS...

1. Design the biped robot and prepare its mechanical structure.
to aim use servo motors to give robot certain degree of freedom in legs and hands.
Degree of freedoms planned as of now : Knee joints, hip joints , 2 DOF at shoulders, elbow joint, wrist motion (if time permits).

2. Programming the Arduino to control robot`s basic movements. This would be easy after learning arduino coding.

3. Remote making and its programming to control robot using remote (wired).

4. Future plan ( if time permits ) – Designing an android app to control the robot (cost not included in approx cost given).

# MILESTONES TO ACHIEVE...

## WEEK 1 and 2: MECHANICAL MODULE

- *Preparing the structure of the robot.*
- *Looking after the various mechanical aspects , involving motion of body parts and stability of robot.*

## WEEK 3: Remote controlling

- *Making of remote and other electrical components to control the robot.*
- *Wired communication between remote and robot*

## WEEK 4 : Arduino Programming

- *Programming the Arduino UNO to take input actions from the user through remote and make the robot to perform the corresponding action.*

## WEEK 5 : DEBUGGING

- *Debugging and buffer week.*
- *Removing errors if any, and a thought on its future enhancement.*

# KEY CHALLENGES...

1. We are likely to be challenged in making the working robot structure. It would be difficult to balance the robot on two legs just using servo motors.
   Solution: We will be able to o it by proper measurements and COM calculations.

2. Defining degrees of freedoms.
   Solution: Using proper calculations and algorithms we can give certain DOFs.

# DEMONSTRATION...

In the initial phase, We plan to demonstrate a remote controlled robot to perform actions like hand waving, walking and some attractive actions.

# SALIENT FEATURES...

1. Robot can move forward, backward, and turn.
2. Easy to assemble and disassemble.
3. Easy to reprogram, change and improve at will.

APPROXIMATED COST – Rs. 7,000 to 8,000

# REFERENCES...


1. http://en.wikipedia.org/wiki/Humanoid_robot

2. http://www.instructables.com/id/Arduino-Biped/

3. http://www.instructables.com/id/Arduino-Robot-v1/

4. http://letsmakerobots.com/content/arduino-biped-code

5. http://www.3ders.org/articles/20120326-how-to-build-a-low-cost-4-servo-arduino-biped-robot.html

6. http://blog.miguelgrinberg.com/post/building-an-arduino-robot-part-vi-remote-control

7. http://www2.cs.siu.edu/~hexmoor/classes/CS404-S09/RobotLocomotion.pdf