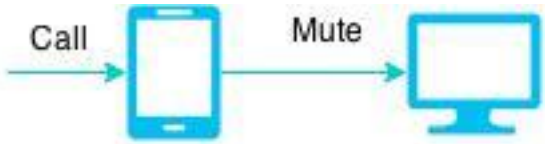
Motion Sensing TV

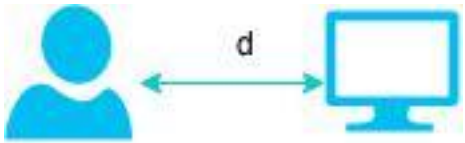
Embedded Systems Lab

Motivation:

- Enhance user's watching experience accommodating movements
- Automated audio/video control is necessary
- Need for such a system in TVs, Computers, Audio Systems, Home Theatre, etc.



Call Control: The device should automatically muted when a call is received.



Movement Control: Volume of the device should be increased or decreased as dictated by the distance *d*

Approach:

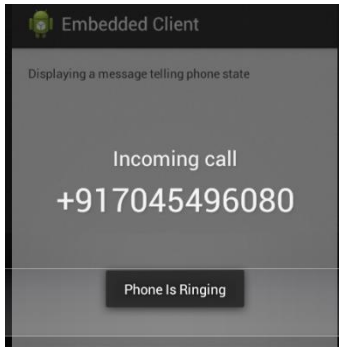
- Develop an android application and a corresponding linux program to mute or unmute the device whenever a call is received on the phone. TCP sockets to facilitate communication
- Use humanoid detection and face detection to find the distance between the device and the user
- According to the detected location of the user rotate the device so that it always faces the user

Work Done :

- Implementation of android application to detect whether a phone call is on or not and muting/unmuting of the device accordingly.
- Finding location and distance of the user with respect to the device using humanoid detection and face detection algorithms.
- Adjusting the volume according to the distance using ALSA Master Control library.
- Output a target rotation angle according to the user's position with respect to the device.
- When multiple users are in the view, selection of primary user to adjust volume and screen rotation accordingly.
- Rotating firebird by the given angle

Results: Video Interface

Phone Interface



The phone application is able to instantaneously send a message to the device and mute/unmute the device. A delay of a few seconds can be seen in the video control component because of complex processing algorithms for face and humanoid detection.