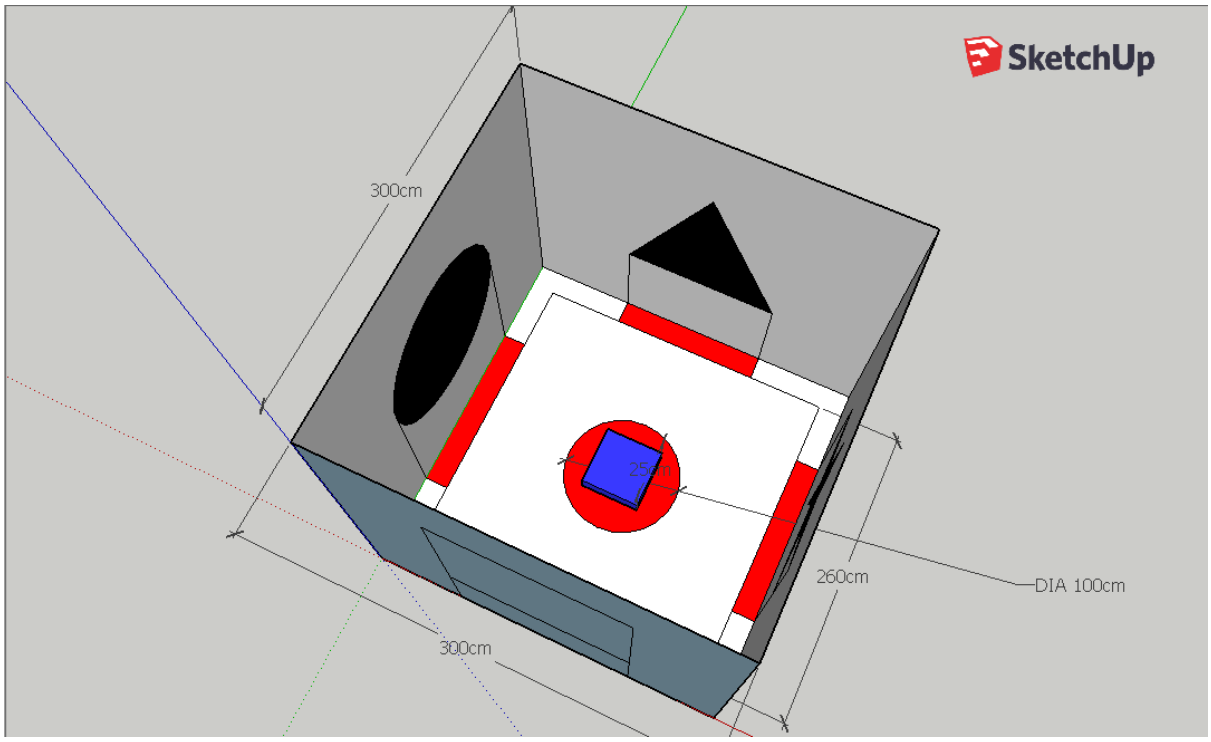
# PHOTOTRON PROBLEM STATEMENT

## AIM:

The objective of this image-processing event is to make an autonomous robot that can detect the shape shown to it and then go to the identified shape in the arena

## ARENA:

The arena consists of 4 walls surrounding a 3m x 3m square area. The side of walls facing the inside of the arena will be white in colour. 4 black shapes (Circle, Triangle, Square, 5-Pointed Star) will be placed at the centre of each edge at a fixed height above the ground. There is a marked circle of radius 50cm with centre of the circle same as the centre of the square area. There is also a marked square of dimensions 260cm x 260cm with the centre of the small square coinciding with the centre of the big square.




## BOT SPECIFICATIONS:

1. The autonomous bot must fit in a cube of 25cm x 25cm x 25cm.
2. An AC power supply of 220V will be provided at the event.
3. If the team wants to bring more than one bot then the bots must not be similar.

## CAMERA SPECIFICATIONS:

The camera participants can bring their own camera or they can use the camera which will be provided by us.

The camera model which will be provided is the C270h model of Logitech. You can find the specifications of the camera on the following link:

http://www.logitech.com/enin/webcamcommunications/webcams/devices/7205

The camera must be on-board the bot.

## IMPORTANT POINTS:

1. AC power supply will be provided. It is the responsibility of the participants to make sure that they have long enough power cables (or) extensions.
2. The teams must be ready to calibrate their bots as per the given light conditions at the venue.
3. Due to the prevailing light conditions there may be some deviation of the image taken by the camera so keep it as a note.
4. The height of the images will be given to the participants during the event and they can set the inclination angle during the calibration time which will be given to them.

## PRE-GAME SETUP:

Calibration time of 15 minutes will be given to each team. Then, the timer will be started. The teams cannot change the code once the timer has started.

## PROCEDURE:

1. The autonomous bot will be placed at the centre of the square. The shape given to the bot to detect will be decided by the organizers at the time of the event.
2. The timer will start when the shape to be identified by the bot is shown to the on-board camera of the bot.
3. The bot is then expected to recognize the shape shown to it and search for the shape among the 4 shapes on the 4 walls.
4. Once the bot has identified the shape, it must start moving towards the shape and the front edge of the bot must at least go to a distance of 20cm from the edge of the wall (as marked by another square) but not touch the wall.
5. Then the bot must turn and proceed towards the centre of the circle. Once the bot fully enter the circle, the timer will be stopped and this will conclude the first run.
6. There will be three such runs.
7. The points of a round will be decided by taking into consideration the accuracy of the bot (the perpendicular distance that the bot is from the centre of the shape while crossing the line).
8. If the bot is not able to cross the line but returns before the 20cm mark itself then the distance of the bot from the 20cm marked line will also be considered while awarding the points.
9. In case of a draw or a close call between two participants, the time will be considered.

In case of any conflict, the organizer will take the final call. Organizers have the right to modify the rules on spot to ensure smooth conduction of the events.

## TEAM SPECIFICATIONS:

1. Each team can have a maximum of 4 members. They may be from different colleges.
2. Each team must be represented by a team leader who must answer to the calls/mails of the organizer.