# SES - BOT 5.0

THE FINAL CHALLENGE

We have prepared, we discussed now It's time to build It.

Up and till now, we have been talking on and on about the SES bot 5.0 and prototyping different modules separately. Time has come to build the whole thing and behold it in all its robot glory.

This document is the definition of the challenge the robot is to accomplish and will be your guide in building it top to bottom and most importantly, giving it some brains. Let's start...

The Game field:
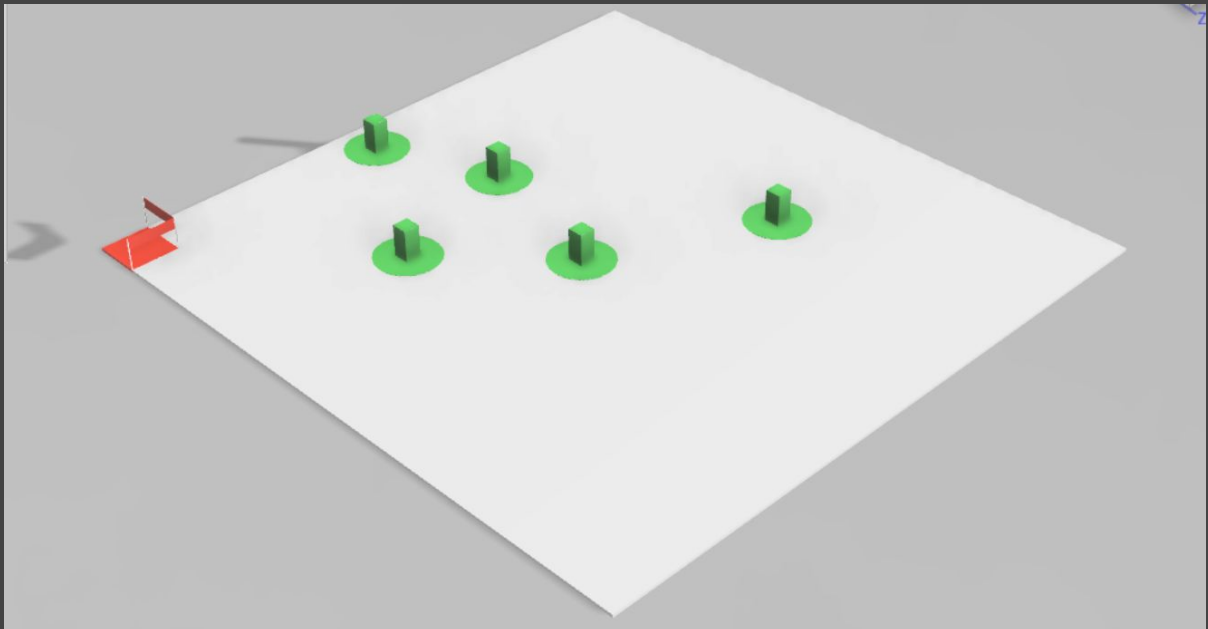
This is the simplest robot game field you're probably ever going to encounter. We have a very good reason for that. This time we want the robot to be more independent of the environment in which it is placed not having to depend on walls for ultrasonic ranging nor lines for line following.

The little green objects are our so called checkpoints and the red area is our start/stop zone.

Here's more detail on the above two elements:

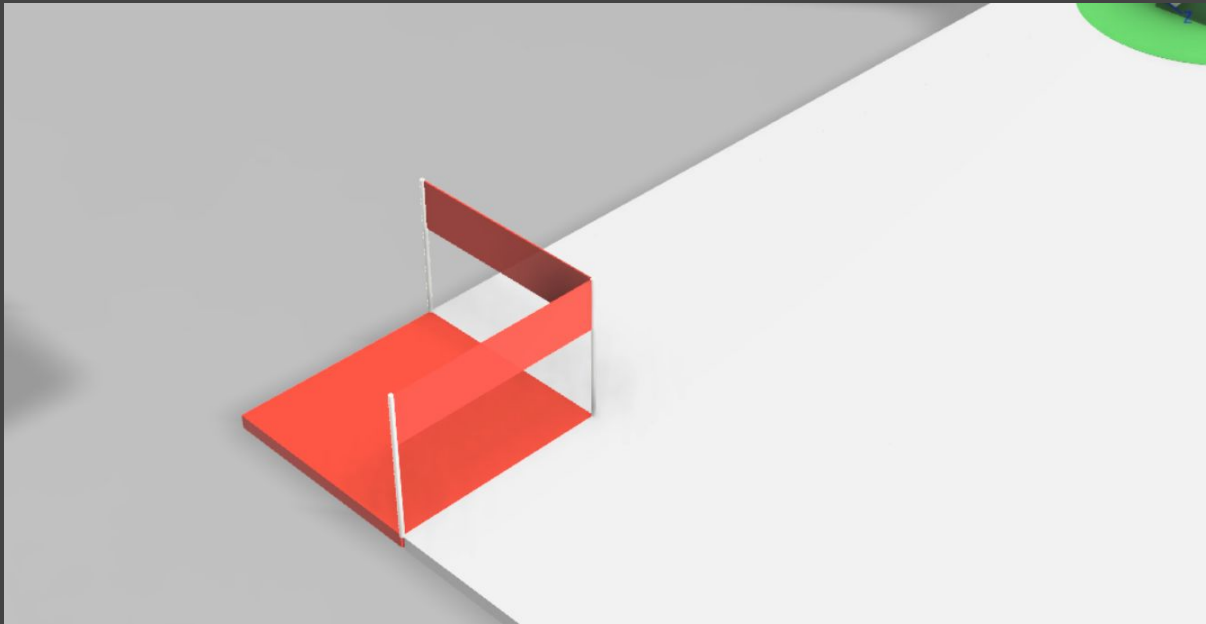## Checkpoints:
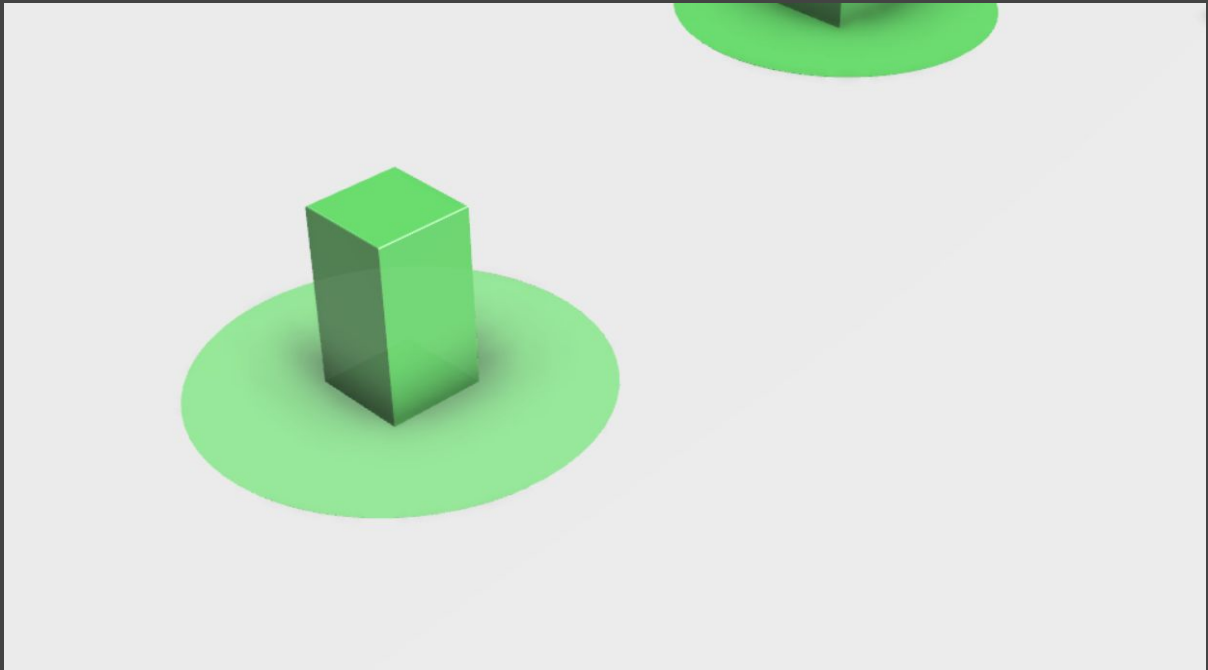
Geometry: Square based prism.
Dimensions: 100 by 100 by 200 (mm)
Checkpoint zone: Dia 300mm

Start/stop zone:

Dimensions: 300 by 300 (mm)
Vertical clearance: 130mm

Challenge definition

The participant robot is required to accomplish the following task:
1. Leave the red start/stop zone.
2. Navigate to the green checkpoints one after the other.
3. From the last checkpoint look for and navigate back to the start zone.

Easy enough right? So what's the catch?

1. The game field as indicated has no side walls hence the major part of navigation cannot be done through range finders.
2. The checkpoints will be randomly placed within the game field i.e. their location with respect to the game field dimensions will not be given.
3. Wireless communication is not allowed once your code has been uploaded, up until your robot completes the course (or tries to).

The above restrictions are to ensure that the the robot depends upon it's 'seeing' and identifying of the checkpoints and stop point through computer vision.
This is the reason the above zones have a different and distinct color from the environment.

The award system.

The SES bot 5.0 challenge is meant to be a competition based on the code the teams produce. Hence there must be an award system to decide whose code does the best.
The criteria used will be as follows:

- Leaving the start zone autonomously will add <u>2 points</u> to the total score.
- Thereafter having all or part of the robot come within the circular zone is considered arrival at the checkpoint and will earn the respective team <u>5 points</u>.
- However, repetition of checkpoints will cost the team <u>1 point</u> per repeated checkpoint.
- Returning to the start point will earn a whopping <u>10 points </u>to the respective team.
- A further <u>10 points</u> are available to each team based on the fluidity of robot motion and execution of the given task.

Other General rules:

- The robot must be fully within the start zone at the beginning of the attempt.
- Once the robot is placed within the start zone and verified to be active and online, The robot is not to be touched again until the the end of the attempt. This does imply that code is to be uploaded wirelessly. Physically aiding the robot after this will be regarded as a failed attempt and all points earned for that attempt annulled.
- The robot may however be touched if it gets stuck and the team wishes to bank the points gained in that attempt.

- A total of 3 attempts will be allowed per team and the attempt with the highest score will be selected for that team.
- There is a minimum of two teams and each team must have a minimum of three persons.

The build

Enough of rules and regulations. Let's now focus on the build.

All the teams will come together to assemble the robot. If you're interested in participating, you can contact any of the event organiser (listed below) so as to be registered as a participant and added to the group in which you can suggest or learn of build dates and venues. Coding, which often requires having the robot around, will be done in a similar manner where a build can be suggested and the robot will be availed for teams to come test and debug their code. <u>No hogging of the bot!</u>

Game Day: <u>1/6/2017</u>

The final event will be held on the above date during the Thursday SES-projects meeting. If you're not a participant but still interested in seeing the final product, you are most welcome to SES projects.

Feel free to ask any questions, **And may the best team win.**

Event organisers

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Society of engineering Students

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