Kshitij 2014

the techno-management fest

PROBLEM STATEMENT

RACE PULSE

Indian Institute Of Technology Kharagpur

Problem Statement:

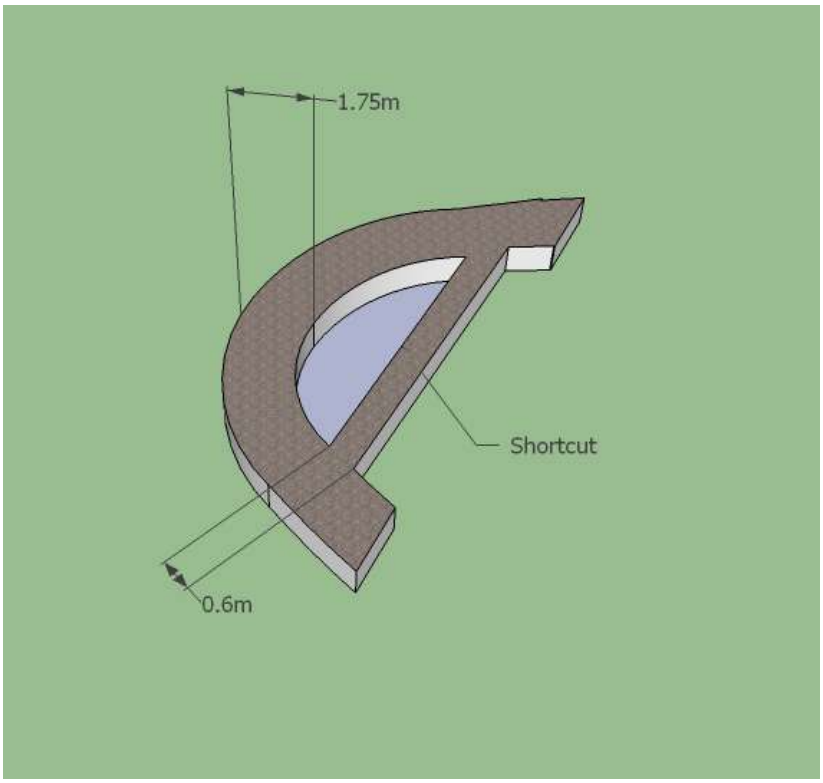
Make a wireless remote controlled model car, powered only by an IC engine, which can be manoeuvred on the dirt track with obstacles.

Arena:

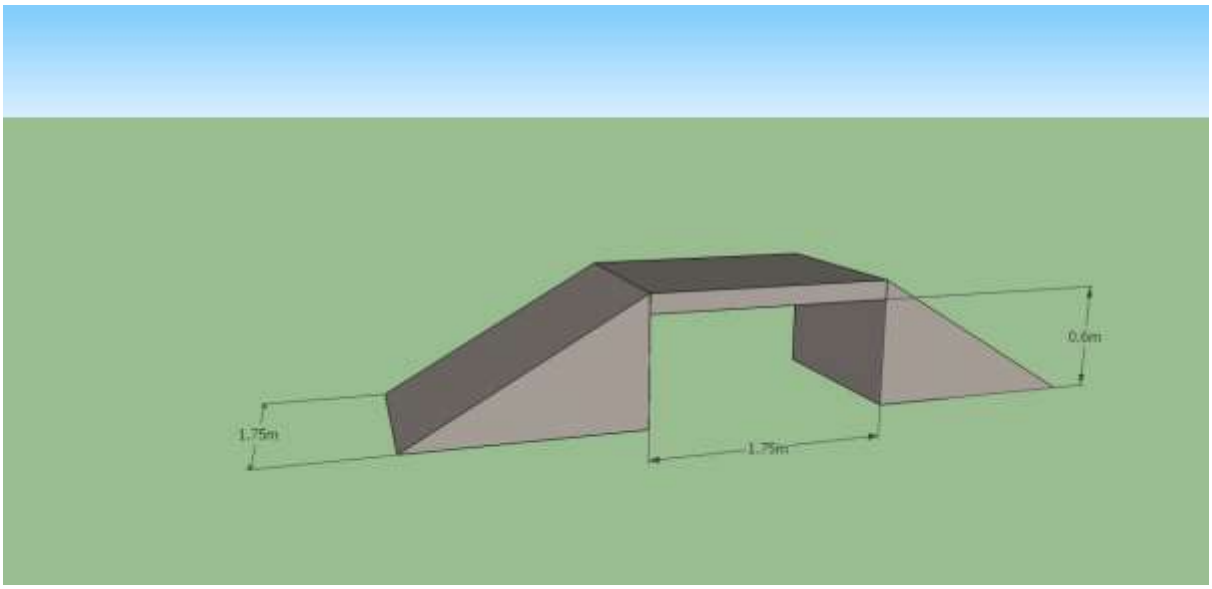
Arena would be a dirt terrain (no mud) with varying amount of dirt along the track. The track would have a distinct boundary and will have obstacles in between as speed breaker, a series of bumps, high held bridge, sharp turns, etc. to test the vehicle on all grounds such as speed stability and control. The track would be a closed loop having certain check points according to which the points will be divided.

Arena will consist of the following obstacles:

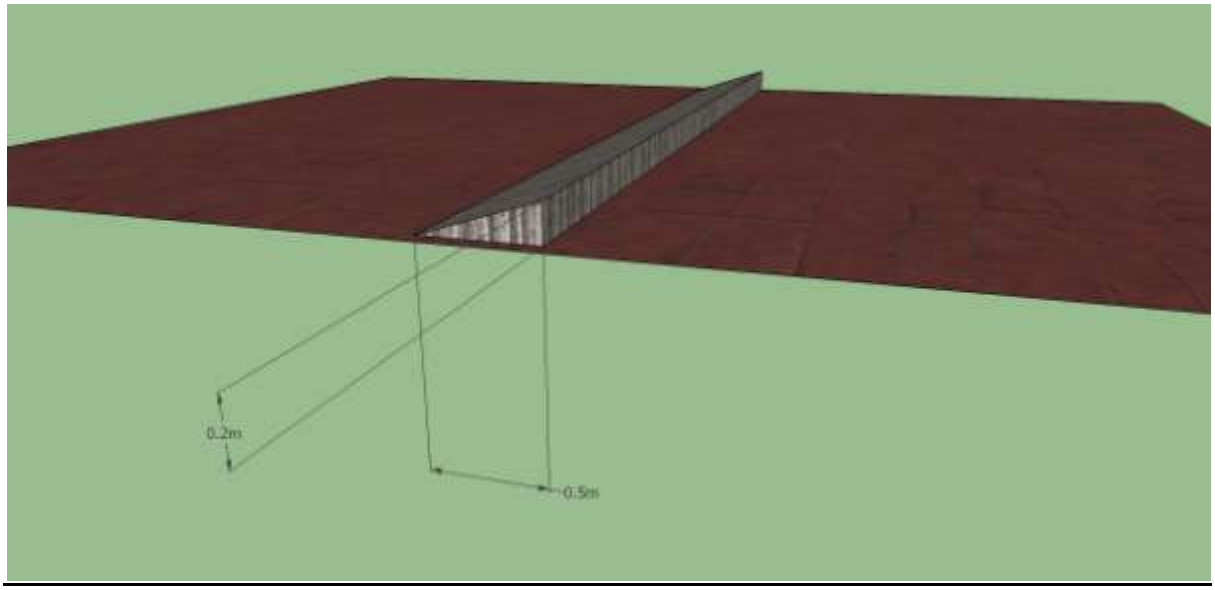
- Total width of track is 1.75m, with few shortcuts of width 0.6m.



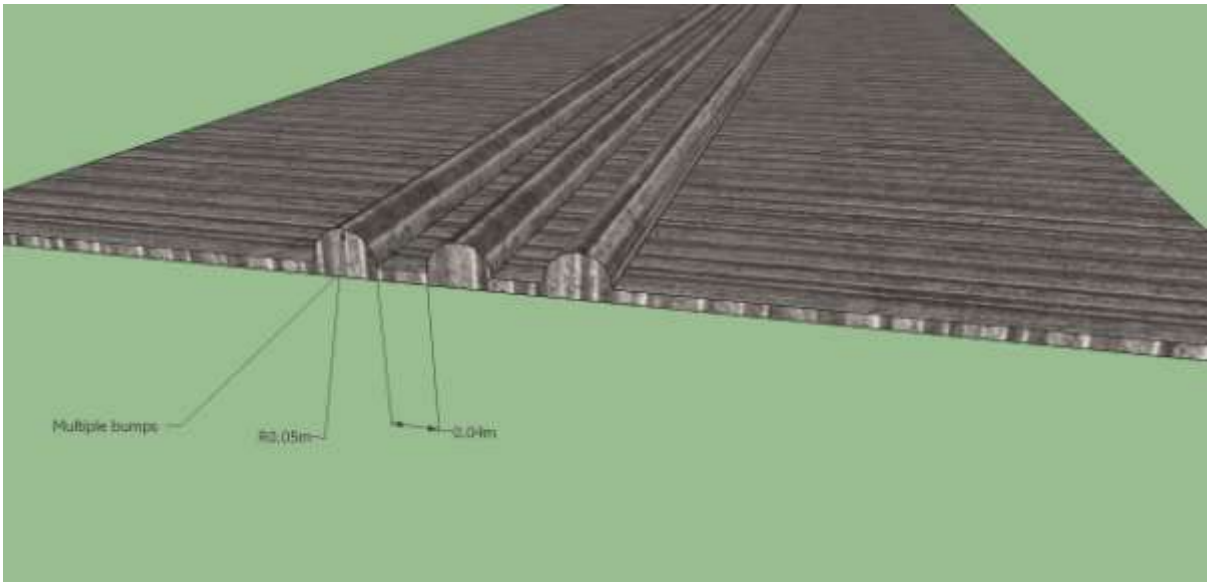
- An overhead bridge of length 1.75m connected by two wedges of length 1.75m and height 0.6m on either side.



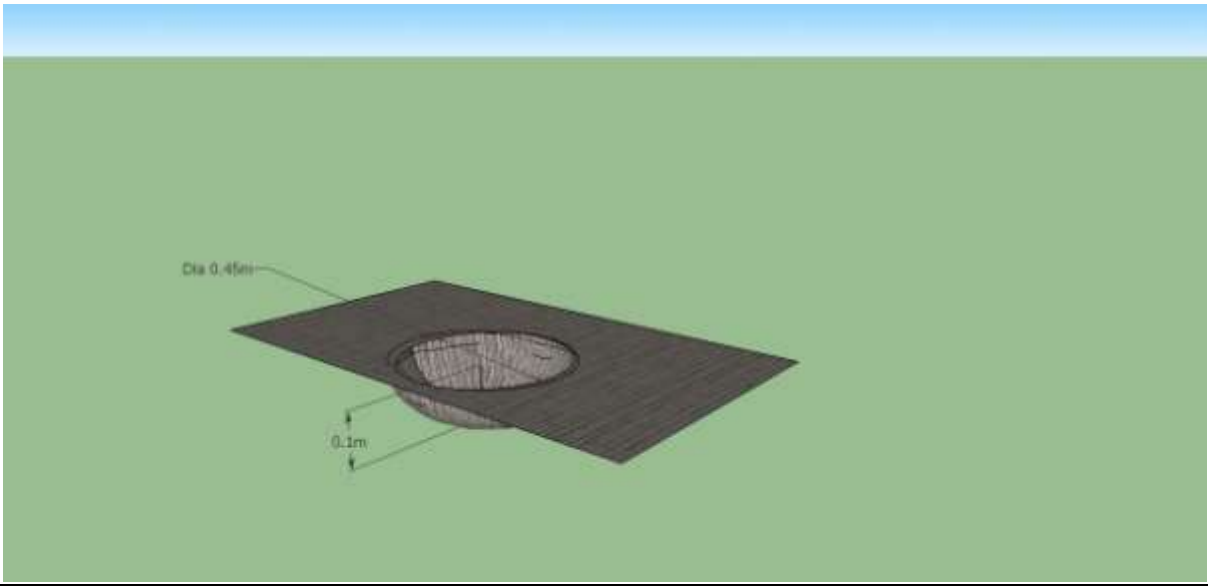
- Wedge of height 0.2m and width 0.5m.



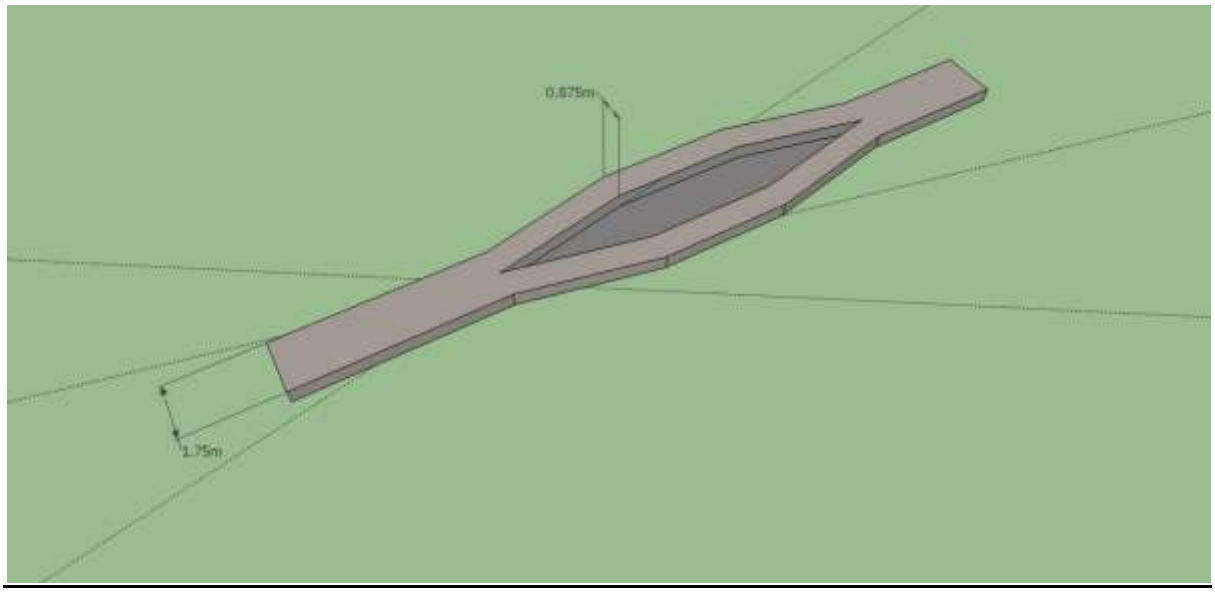
- Multiple bumps of radius 0.05m each separated by a distance of 0.04m.



- Potholes of diameter 0.45m and depth 0.1m.



- A two-way path of 0.875m each.



General Rules:

- The team will have a maximum of 5 students.
- The team will have to answer the set of questionnaire that is uploaded here. This is to ensure that the team does not get a readymade car.
- The participants need to send a video clip of the car. The video should be an unedited clip, at least 1 minute long, showing the machine running at least 10-15 meters and performing a U turn on an off road dirt area. The clip should be preferably in AVI format.
- Teams would be given specific slots to practise in the arena. Teams are supposed to come during their practise slot and use the track. The slots will be given on first come first serve basis. Any request regarding extension of slots or exchange of slots will not be entertained.
- The teams must adhere to the spirit of healthy competition. The teams must not damage the opponent's machine in any way. Judges reserve the right to disqualify any team indulged in misbehaviour.
- The team ID should be clearly visible on your model.
- The participants will have to submit the set of questions on their working model before the competition. The last date of submission of the answers is 5th January, 2014. Only the teams who have submitted this would be considered during the event in Kshitij, 2014.

- The teams can mail their abstract to race_pulse@ktj.in or send a printed copy to
  Kshitij,
  Technology Students' Gymkhana,
  IIT Kharagpur,
  Kharagpur-721302.
  (03222)- 81185/281387
- The participants have to control their model car in the arena with the help of 2.4 GHz frequency remote control from a platform which is 10 feet above the ground. Only one team member is allowed to be on the platform.
- Fuel for the car will be provided at the arena at the prescribed rate. If there is some problem with the car during the event, hobby shop would be there for any repair. The cost of this would be paid by the participant only.
- No power supply would be provided.
- The teams are not allowed to leave any loose part(s) on the arena. If found, they would be immediately disqualified.
- The organizers reserve all rights to change any or all of the above rules. Change in any rule, if any, will be highlighted on the website.
- All rounds of the event will be held at IIT Kharagpur during Kshitij, 2014.
- If the car runs away from the track, topples or halts, the team member present on the arena can reset the car from the nearest check post. The member should keep the car behind the check post; time would be running during this.
- Teams are not allowed to damage the model car of other teams on or off the arena. If found doing so, the team would be disqualified. This will be subject to the judges' discretion and would be final.

EVENT STRUCTURE

The event will be carried out in 3 rounds.

- Round 1:

1. The track for this event will be circular with a width of 1m.
2. The team will have to take two rounds of the track.
3. The time taken by the car will be noted and a specific number of teams will proceed to the next round.

- Round 2:

1. The teams will have to complete 3 rounds of the track.
2. The track would be closed loop with specific number of check-posts.
3. Points will be awarded for every check-post cleared.
4. Time taken to complete 3 rounds will be recorded and the teams will be ranked accordingly.

- Round 3:

1. The third round will be the knockout round.
2. The round will be scheduled according to the time in which the car completed the 2nd round.
3. The knocked out teams could get another opportunity based on their times will be decided during the course of the event.
4. Thus at the end of 3rd round we will have shortlisted winners that would be ranked on the basis of time taken by them to complete the lap in the same round.