# INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR , KSHITIJ 2016

# Droid Blitz

## Manual Robotics

USP :Amphibious robot and coordination between two robots

**Problem Statement** :To build a remote controlled electric-powered robot that can be used to complete broken pathways and transfer packages by running on land as well as water.

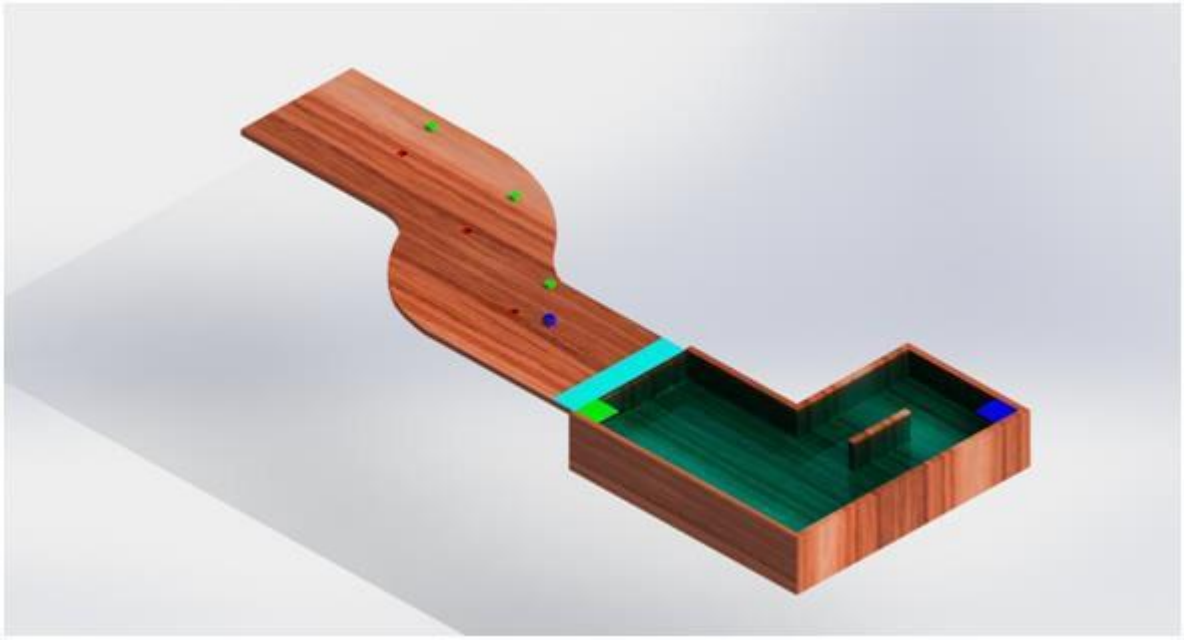
**Task** : The robot has to perform tasks on land and water and complete pathways by placing blocks kept on land in the given slots.

**Round 1** :

**Task :**

- The arena has 2 zones a **water** and a **land** zone.
- There are 2 types of blocks, 3 **green** coloured and 1 **violet**.
- There are 3 **red** coloured voids in the arena.
- The **violet** block is to be carried across the channel and placed on the **violet** coloured zone in water.
- The **green** coloured zone in water is the **end** zone.
- Time and points based round.

- The robot running on land has to pick up **green** coloured objects (on land) and complete its path (bridge) by placing the objects in **red** coloured slots on the arena.
- On reaching the end of the land zone it has to pick up the **violet** package and place it on the robot in water.
- The robot in water has to follow the specified path and deliver the package at the **violet deposit zone**.
- The robot has to move around the blockade in the channel and then reach the **green end** zone to finish the round.
- If the participant brings a robot capable of traversing on both land and water he can complete the bridge and at the same time pick up the package and deliver it across the water while following the specified path to complete the round successfully.
- Maximum time allowed for the event is **3 minutes**.
- Maximum number of **Time-outs** allowed will be **1** ( for 1 min) and only one **restart** will be allowed and points will be deducted for the same.
- Restart would be given for only **technical fault** in the bot.

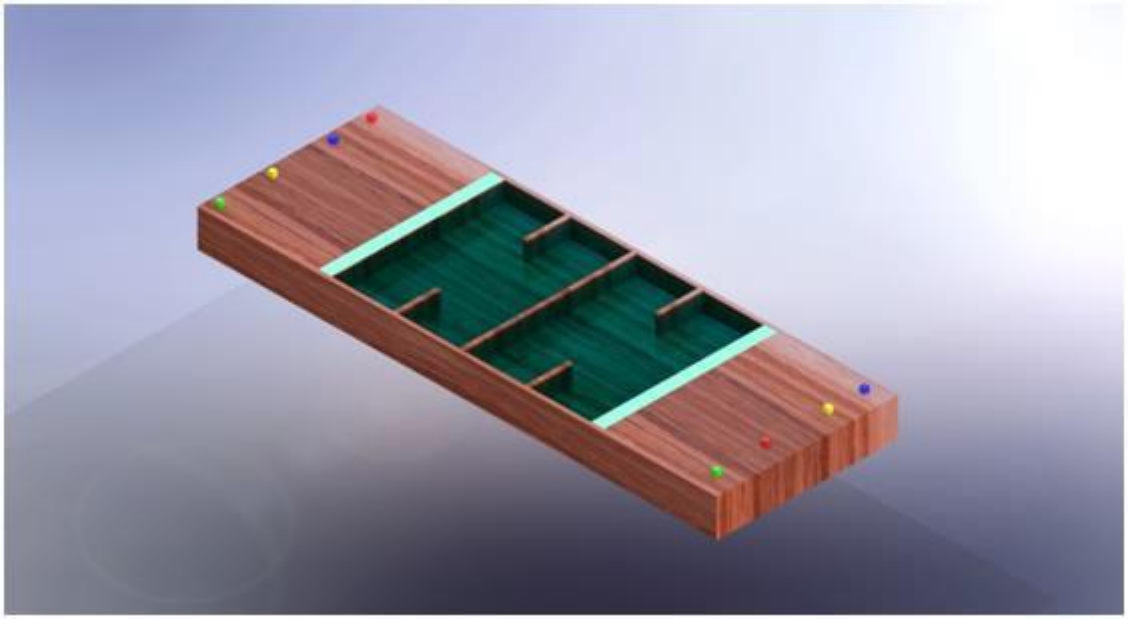


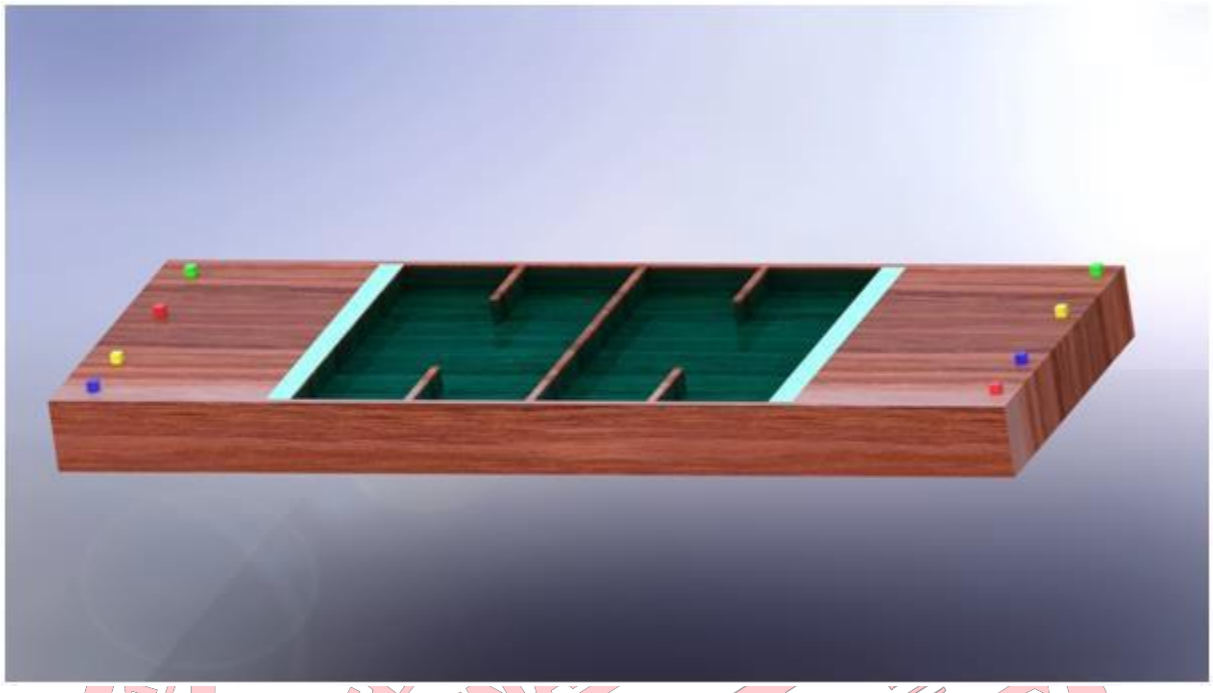
**Round 2**:

**Task:**

- The arena has 2 zones a **water** and a **land** zone.
- This will be a **one on one round** and there are two different arenas for both the teams.(The thin wall separates the arena)
- The teams have to deposit the **4** blocks in **4** different zones in the arena.

- The **blue** coloured zone is the **deposit** zone for the blocks.
- All the blocks have to be placed on the **blue** before moving them in the deposit zones in water.
- **Coordination** round.
- Two teams one on one (knock-out round).
- First team to complete all the tasks or the team with most points at the end of the specified time limit wins.
- The teams have to pick up blocks kept on land and place it on specified zones near water.
- All the blocks on land have to be placed first before starting the tasks in water.
- The team that has a **separate** land and water can move only **one robot at a time** the other has to remain stationary.
- **Multiple** blocks can be picked at once.
- **Once all the blocks are placed near water** the robots have to enter into water and pick up those blocks, navigate through water channels and place them at the specified locations on water.
- After placing all the blocks the robot has to reach the **end zone** in water.
- Maximum time allowed is **4 minutes**.
- Maximum number of **Time-outs** allowed will be **2** ( for 1 min) and only one **restart** will be allowed and points will be deducted for the same.
- Restart would be given for only **technical fault** in the bot.





**Arena Dimensions :**

**Round 1:**

- Width of the land and water zone both are **100 cm**.
- **Green** coloured blocks are **4cm x 4cm x 3cm** (l*b*h).
- The **red** voids are **6cm x 6cm x 3cm** (l*b*h).
- The **violet** block is **6cm x 6cm x 6cm** in dimension.
- All the blocks are solid and made of wood.

**Round 2:**

- **All** the blocks are **6cm x 6cm x 6cm** (l*b*h).
- The deposit strip is **15cm** in width.
- The water zone is **200cm x 150cm** in dimension.

**Rules and Specifications :**

**General Rules:**

- All arena dimensions have a tolerance of 10%.
- Maximum number of participants allowed per team: **5 people.**
- Each team should have unique participants i.e. no two teams can have even a single participant common.
- The team members can be from different institutes or colleges.
- Teams qualifying the first round will go into the second round and and those qualifying the second round will participate in the third round.

- The teams cannot touch their bots during the course of the run, unless timeout is taken.
- The right spirit of participation is expected from the participants.
- The participants will be provided with **220 Volts, 50 Hz** standard AC supply.
- Participants will have to arrange for any other power supply required for their robot.
- Teams cannot tinker with their bots during the run.
- LEGO kits or its spare parts or pre-made mechanical parts are not allowed. (http://en.wikipedia.org/wiki/Lego_Mindstorms)
- The decision of the organising team will be final and binding.
- **No submissions prior to the event are required.**

## Event Rules:

- The participants can use any suitable mechanism for water, land traversal and for their amphibious robots.
- The team that brings two separate robots for land and water traversal can operate only one robot at a time.
- The robot will not be allowed to move ahead without completing the path.
- During the one on one round obstructing the motion of other teams robot will be penalised by disqualification.
- Robot has to move in specified channels and bumping into the arena will be penalised with negative points.

## Robot Specification :

- Participants can bring two separate robots one that travels on land and one that moves on water or they can bring a single amphibious robot that can travel both on land as well as water.
- The robots must be electric powered and wireless (remote controlled).
- A pair of receiver and transmitter (Rx and Tx) will be provided by organizers, on prior request of the participants. The Tx-Rx pair has 4 channels. It can be used to control a maximum of 3 servomotors. Participants who wish to use Rx and Tx provided by us, will have to make provision for this receiver on their robot. The participants can bring their own set of Rx and Tx if they want.

## Scoring :

## Rewards-

1. Picking object on land: +25 points
2. Placing object in the slot(**Round 1**): +50 points

3. Picking up the **violet** package(**Round 1**): +25 points
4. Reaching end point on the land(**Round 1**): +50 points
5. Placing package in the deposit zone(**violet**) in water(**Round 1**): +75 points
6. Reaching end point(**green**) on water(**Round 1**): +50 points
7. Time Bonus: +(Time Left x 2)
8. Placing an object in deposit zone on land(**Round 2**): +50 points
9. Placing a package in the deposit zone on water(**Round 2**): +75 points
10. Reaching end point on water after completing the task(**Round 2**): +50 points

## Penalties-

11. Package falls into water: -25 points
12. Bumping into the arena: -25 points
13. Restart: -100 points
14. Timeout: -50 points

## Scoring Formula:

- **Base Score(B): 1000 points**
- Scoring formula for Round 1:**B**+25*(**1**)+50*(**2**)+25+50+75+50+(**7**)-25*(**11**)-25*(**12**)-100-50
- Scoring formula for Round 2:**B**+25*(**1**)+50*(**8**)+75*(**9**)+50-25*(**11**)-25*(**12**)-100-50*(**14**)

## Tutorial & Resources:

Visit website link to check out the latest Event Updates.

Read our tutorial for Droid Blitz.

Join the Event Facebook Group for latest updates and doubt sessions.

## Contact:

For queries, contact our Event Heads: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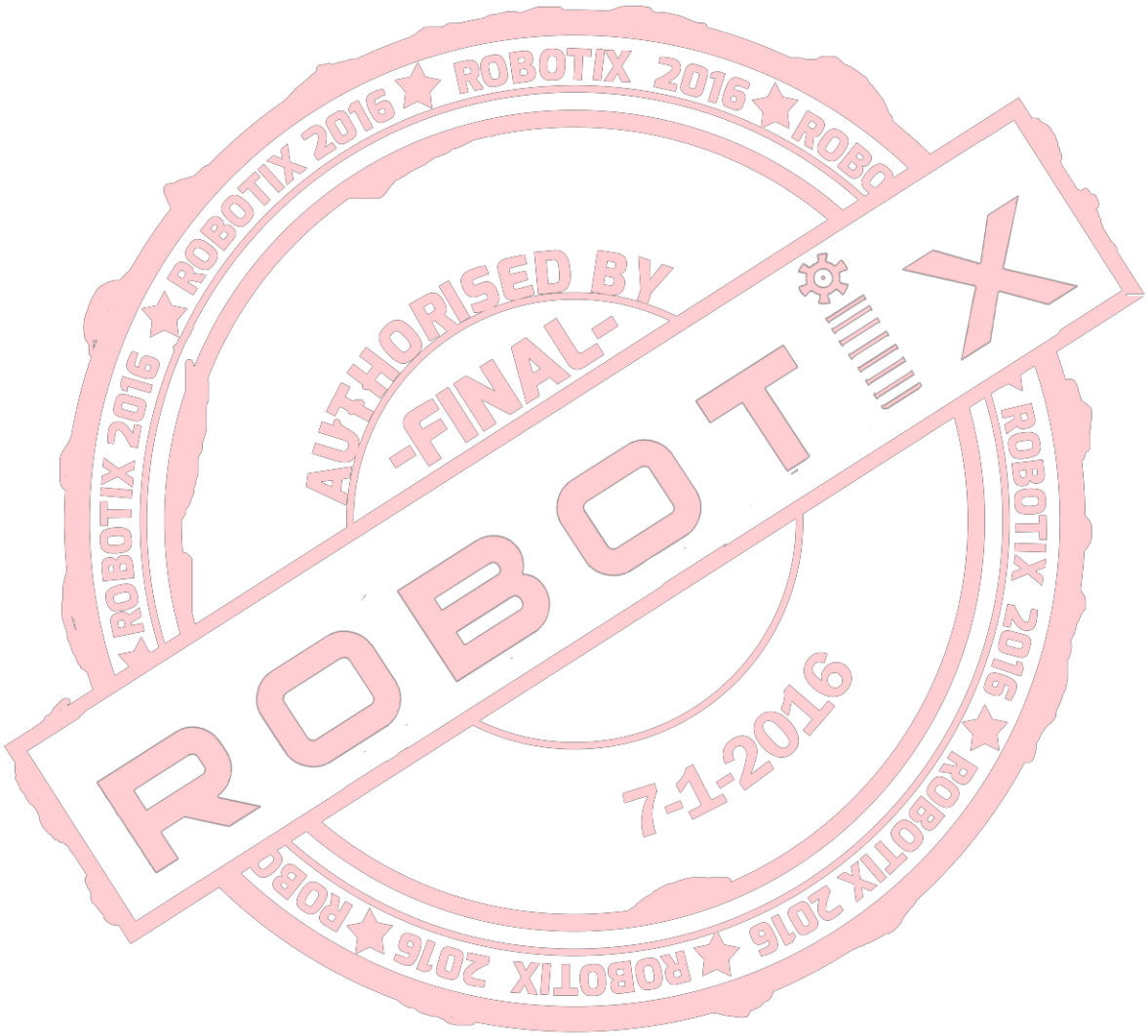
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