

## RUSH HOUR

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### EVENT DESCRIPTION :

This is a space themed line follower robot competition.

In the first phase of the onsite round the robot has to follow a path surrounded with obstacles. In the Finals, the bot starts from the ending point of the preliminary round along with an integrated kit (which will be based on wireless communication) which will be given to the teams on the day of the event.

The last date of the abstract submission is February 5,2015

### FORMAT :

This event consists of 2 phases

#### Phase 1 (online)

Online abstract submission

**Prelims Round:** This will be an abstract round. Send your abstract to [rushhour@pragyan.org](mailto:rushhour@pragyan.org). The last date of the abstract submission is February 5, 2015.

**Guidelines for the submission of the abstract are as follows:**

**Rename** the .doc file as "Pragyan Abstract.doc" (example: P1001.doc where P1001 will represent the respective team head) and email the file to [rushhour@pragyan.org](mailto:rushhour@pragyan.org)

**Mention the name of the team head and other members along with their respective Pragyan ID in the subject clearly.**

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Please fill in the information mentioned below in a doc. file.

The abstract of your bot will be helpful everywhere in future as an evidence of your hard-work, along with determining your position for the competition. So please pay adequate attention to it.

Please fill in the following details:-

Team Name:

Team Leader's name:

PID:

Contact Number:

Team Member's Name:

PID:

Fill in the information about your bot in the respective sections as mentioned below:

1. Describe your plan of action for the competition.
2. Describe any unique idea(s) you have used for the competition.
3. Give the specification of all the parts that you have used apart from the ones mentioned in the kit to be provided by the Pragyan Organizing Committee.
4. Pseudo code

Each team is allowed to make **only one** submission. In case of multiple submissions, only first submission will be evaluated. Shortlisted abstracts will receive components from Texas Instruments. The components sent must be used for the bot.

**The details of the abstract will remain confidential with the managers of the event.**

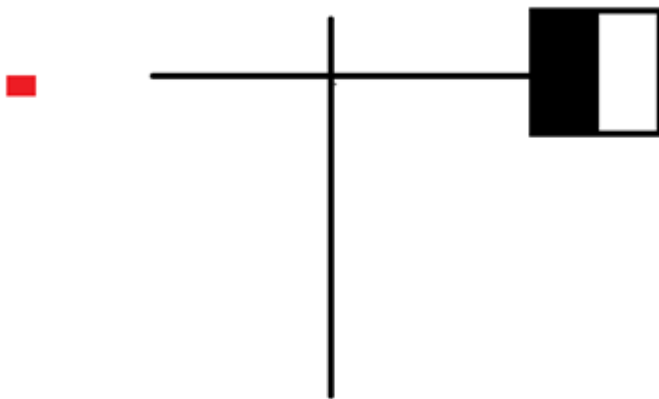
## ***Phase 2 (onsite)***

Preliminary round

Final round

**For the Onsite Preliminary round,**

The bot must stop when it detects a black zone (5 cm x 5 cm). This will be the end point of the preliminary round



End zone

Obstacle at 15 cm from intersection.

The bot must sense the IR led checkpoint (3 cm -8cm high) kept 15 cm from the track on the left hand side of the track and it must make a turn accordingly.

The bot must stop when it detects a black zone (5 cm x 5 cm). That will be the finish point of the Preliminary Round.

The teams are allowed to use readymade sensor kits. But use of Lego kits and any other readymade components is not allowed (readymade PCB for handling microcontrollers are not allowed).

The scoring will be based on time, obstacles evaded, smoothness of the bots and indication at end point (receiving the IR input and indicating with a led clearly visible to the event manager). In case of a tie the abstract will be considered to decide the position of the team. The decision of the event manager(s) is final and binding.

**For the Final Round**

The bot must stop when it detects a black zone (5 cm x 5 cm).

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The bot must sense the IR led checkpoint (3 cm - 8 cm high) kept 15 cm from the track on the left hand side of the track and it must make a turn accordingly.

Finalists have to be prepared to stay till Day 3 (Sunday) of Pragyan'15.

## **RULES :**

- All students with a valid identity card from their respective educational institution are eligible to participate in the event.
- All teams will be given a calibration time of 10 minutes.
- Maximum time given for one trial is 10 minutes.
- The starting procedure of the robot should be simple and should not involve giving the bot any manual force or impulse in any direction.
- Each bot is supposed to indicate with a suitable indicator (LED, Buzzer, etc.), clearly visible to the judges, when the bot has reached the check point. This indicator should be off at all other times. Any team unable to indicate this accurately will incur a penalty.
- Before each game begins, the participants should clearly describe how their robot detects the obstacles and indicates at the check point.
- Each team is allowed a maximum of 3 trials. All trials require the approval of the presiding judges before the bot can be removed from the arena. In each trial, the timer and points will be set back to zero. The best time/points of the three trials will be considered.
- The judges can reduce the number of trials for any team if time constraint arises.
- During a trial, the bot will have to be restarted by putting it back on the start zone. For a trial, the bot will have to be in Power Off mode and turned on again at the start zone on the signal of the judges.

Between trials, participants may not feed information about the arena to the bot.

However, participants are allowed to: Adjust sensors (Gain, Position etc.), Change speed settings and Make repairs. However, a participant may not alter a bot in a manner that alters its weight (e.g. removal of a bulky sensor array or switching to lighter batteries to get better speed). The judges shall arbitrate. The points earned by the team till that time will be retained.

- Participants will not be allowed to handle the obstacle positions on the track. Only event managers are allowed to handle the obstacles.
- Participants are not allowed to keep anything inside the arena other than the bot.
- The judges may stop any robot at any time if they feel that it is performing, or is about to perform, any action that is dangerous or hazardous to people or equipment. No robot is allowed to use any flammable, combustible, explosive or potentially dangerous processes.

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- Readymade sensors (eg. line array sensors) could be used.

## **Robot Specifications:**

1. The dimensions of the bot should be within 200 x 200 x 200 millimeters (Length x Breath x Height).
2. The Potential Difference between any two points in a robot should not exceed 12V.
3. The Bot must and only have on-board power supplies.
4. The Bot should not have any sensors for sensing the environment around. (eg. Kinect)
5. Use of onboard camera is prohibited.
6. The organizers reserve the right to disqualify any bot that is found to not adhere to the specifications.

## **General Rules:**

- The time and points measured by the organizers will be final and will be used for scoring the teams. Time or points measured by any participant by any other means is not acceptable for scoring. In case of any disputes / discrepancies, the organizers' decision will be final and binding.
- Participants must bring their own computers, programmers and software if they wish to program their robots at the competition site.
- The participants are requested not to assume anything without discussing with the event managers.
- The organizers reserve the rights to change any or all of the above rules as they deem fit.

## **Team Composition:**

- Maximum of 4 participants per team.
- Teams should register themselves online.
- No person shall be a member of two teams.
- A team can constitute of member from different colleges.
- Participants are requested not to assume any details.
- Other details regarding the arena can be clarified directly with the event managers.

## **JUDGING CRITERIA :**

Preliminary Round:

- Points and time will be awarded on completion of each segment of the track and points deducted for each obstacle the bots hit.

Final Round:

- It will be informed to the finalists during Pragyan'15.

## **PROBLEM STATEMENT :**

In the preliminary round, the bot will have to traverse on a black line drawn on a white background which will include acute angle turns, curved tracks and obstacles placed on the track. This part will be evaluated on the basis of points scored and the time taken to complete the track.

For the Final Round, top teams from the preliminary round on the basis of points scored and time, will be given a surprise kit which they have to integrate with their existing bot. Details about the kit will be specified to the finalists on the completion of the preliminary round. Any queries regarding the final round before the completion of the preliminary round will not be encouraged.

## **FAQ :**

### **1. Who can participate?**

Students from any college or university can participate in this event. If you are a beginner, resources may help you out.

### **2. How many members are allowed on a team?**

A team can have a maximum of 4 members.

### **3. Can I participate without submitting the abstract?**

NO, abstract is the important and necessary part of the event and is required as it is the first selection criteria for participating.

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#### 4. Are there any prerequisite to register for this event?

NO.

#### 5. Will any facility for charging our equipment be given at the venue?

Yes, 220V power supply with extension cords will be given.

#### 6. Do I need a working prototype when registering for the Event to pass Phase 1?

No, the final working robot is needed only when you come down to Pragyan - to compete in phase 2. You need to describe the design aspects, Team members and team name in the abstract which you submit in phase 1.

#### 7. Will Participation certificates be provided?

Certificates will be given only to winners.

#### 8. When is the event going to be held?

Rush hour starts on day 1 (Friday) with prelims.

### RESOURCES :

1. <http://www.argenox.com/library/msp430/>
2. [http://www.embeddedrelated.com/blogs-1/nf/Enrico\\_Garante.php](http://www.embeddedrelated.com/blogs-1/nf/Enrico_Garante.php)
3. <http://www.ermicro.com/blog/?p=2104>
4. <http://learningmsp430.wordpress.com/2014/01/10/line-follower-using-msp430g2-launchpad/>

### PRIZE MONEY: Worth INR 25,000

**CONTACTS :** Harish: +919486431923

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