

**e-Yantra Robotics Competition - 2016**

**Implementation Analysis – Explorer Bot**

**<Team ID>**

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| --- | --- |
| **Team leader name** |  |
| **College** |  |
| **Email** |  |
| **Date** |  |

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This report contains three sections:

1. Preparing the Arena

2. Design Analysis

3. Algorithm Analysis

Teams have to answer question/s from these sections according to their understanding of the theme.

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**Preparing the Arena** **(5)**

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Prepare the arena according to the steps given in Section 3: Arena, of the rulebook. Please follow the arena configuration shown in “Figure 2: Placing Objects according to Input 1” of the rulebook. Take a photo of the completed arena such that the entire arena is clearly visible in the photo. Insert the image here.

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**Design Analysis**

**Q1. Teams have to make a mechanism for placing the camera to detect the markers.**

1. **Choose an option to position the mechanism on the robot and why? (5)**
2. **Front 2. Back 3. Right/Left**

**Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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Justify your choice for placement of the mechanism.

Word-limit: 300 words.

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1. **Explain the design of the mechanism and how it is mounted on the robot. (10)**

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Explain and draw figure(s) of your mechanism and show how you are planning to mount the mechanism on/around the robot.

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1. **To design the mechanism for Camera to detect marker, what challenge/s do you expect to face and how you will overcome them? (5)**

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Explain the difficulties you expect to face while detecting marker using the mechanism and the possible solution/s to overcome these challenge/s.

Answer format:

1. Challenge:

Solution:

1. Challenge:

Solution

Etc.

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**Q2. Explain the package/s used for marker detection and algorithm to classify correct object after detection. (5)**

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Answer format for algorithm: Bulleted form

Step 1:

Step 2:

Step 3…etc.

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**Algorithm Analysis**

**Q-1 Draw a flowchart illustrating the major nodes and topics that are used for theme implementation. How are ROS nodes in Arduino and Raspberry Pi connected with base Station? (20)**

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The flowchart should elaborate on every possible node and topics that you will be using for completing the assigned theme.

Follow the standard pictorial representation used to draw the flowchart.

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**Q-2 Explain the implementation of following task in theme:**

**a. Path Planning**

**b. Motor speed control**

**c. Visualization of robot in Rviz**

**d. Localization of robot in Rviz (10)**

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Path Planning- What is the role of path planning in theme completion? How path planning will be done?

Motor speed control- Why is motor speed control necessary in theme? How do you control the speed of motor?

Visualization of robot in Rviz- What are the necessary requirement to visulaize robot in Rviz? What is the role of visualization of robot in theme completion.

Localization of robot in Rviz – How to localize physical robot inside Rviz? Explain techniques and requirements for robot localization

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**Theme Implementation**

**With the end of Task 3 you must have finished the construction of the explorer bot. Now, study the rule book and try to implement the solution for the theme. Final task of the competition is to submit the video and code for the theme implementation. Submission date for video and code will be notified in future.**

**Start early and be ready for video submission. Stay tuned for further instruction.**