# e-Yantra Robotics Competition (eYRC 2019-20)

# Task 1 - Supply Bot

**Welcome to Task 1 of Supply Bot!**

The aim of this task is to make your team better prepared with the theme by giving you different assignments that will take you step by step closer to the final task of the Competition. Task 1 is one such assignment in Stage 1 of the competition.

Task 1 is a purely software based programming task. We will use Python programming language for all software tasks. This task specifically includes image processing problems and builds upon the concepts and basics you learnt in Task 0. Specific information about each task can be found in **"Task Description"** sub-folders.

## Directory Structure

All the sub-tasks will be auto-graded and thus, maintaining the directory structure while submitting is crucial. Remember that any alteration in the directory structure or name of pre-existing files will result in 0 marks for that question and/or invite penalty marks.

The directory structure shown in the figure (Fig.1.) below will be given to you upon unzipping the Task 1 zipped folder you downloaded from the portal:

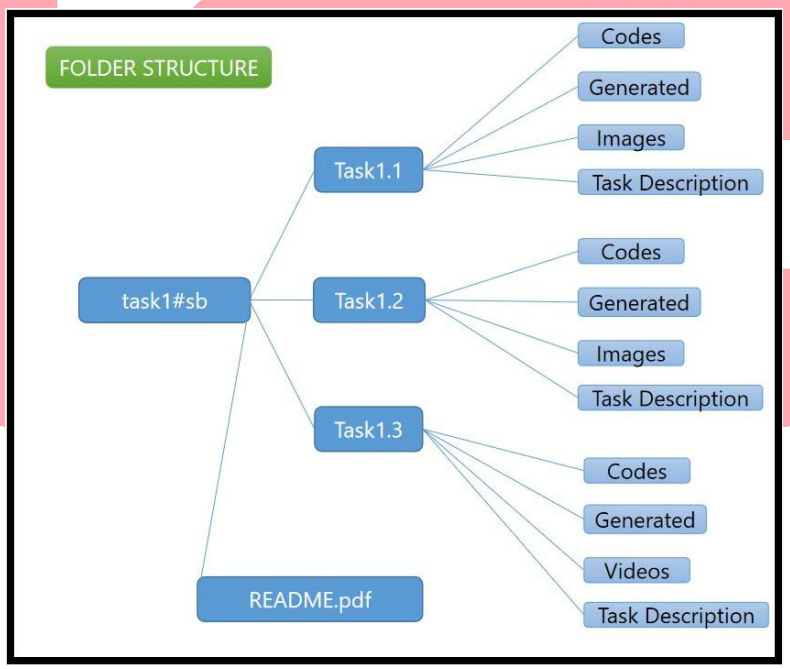


Fig. 1.

As seen in Fig.1. there are 3 sub-tasks for Task 1 along with this READ ME. All sub-tasks are compulsory and will be scored.

Since the team has to submit Task 1 in two parts, kindly follow the submission folder structure as shown (Fig.2) and (Fig.3) below, Any other Directory Structure is Unacceptable! And will not be allowed to upload on the portal.

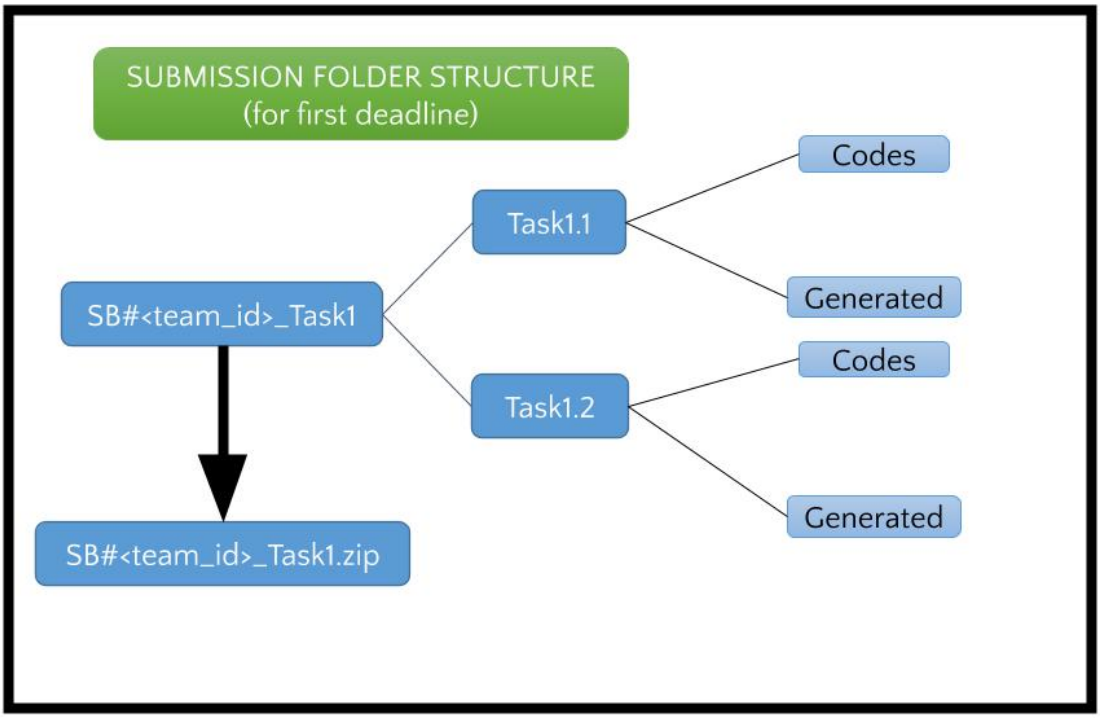


Fig.2(**13th November 2019 deadline**).

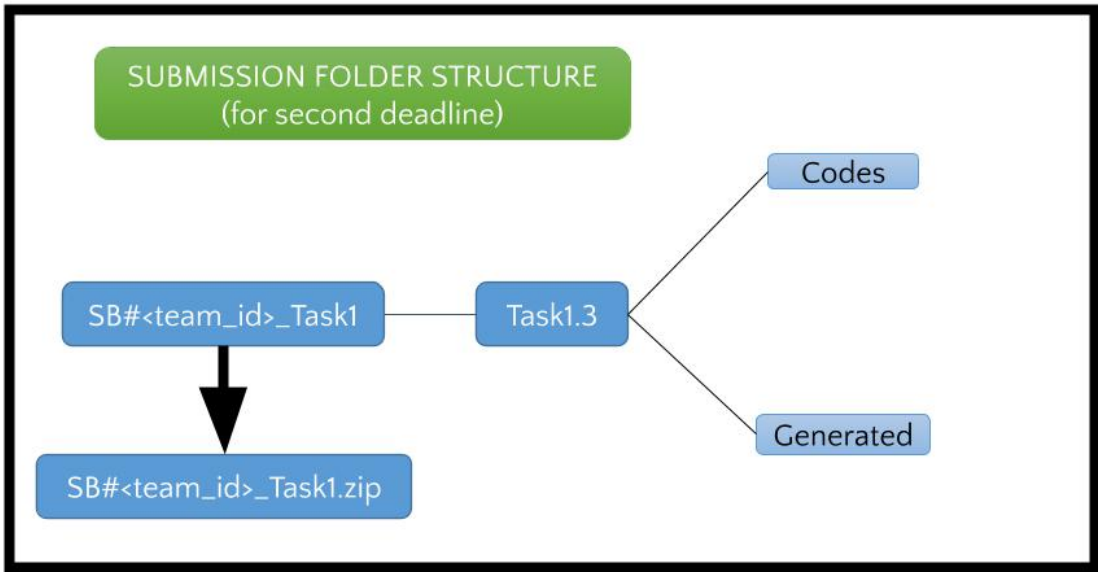


Fig.3(**26th November 2019 deadline**).

- **Task 1.1 - Angle Alpha**
  This sub-task focuses on finding angle (in degrees) between two points: the red dot and the green dot. ***Note:*** The two points the red dot and green dot will be placed at different positions in each different (input) Image. You have to find the angle upto 2 decimal points in accuracy.
  This folder contains 4 sub-folders -
  - **Codes**
    Contains the program files(s).
    - *main.py*
  - **Generated**
    This folder is where you'll save the images/results from your task.
  - **Images**
    This folder contains images to work on.
    - *image_1.png*
    - *image_2.png*
    - *image_3.png*
  - **Task Description**
    Contains file(s) which describes the overall sub-task.
    - *Task Description.pdf*

- **Task 1.2 - Fill In**
  This sub-task focuses on completing a missing segment of an inner black ring in the test images given. This missing segment will be at located at different sections of the inner black ring for different (input) images.
  This folder contains 4 sub-folders.
  - **Codes**
    Contains the program files(s).
    - *main.py*
  - **Generated**
    This folder is where you'll save the images/results from your task.
  - **Images**
    This folder contains images to work on.
    - *image_1.png*
    - *image_2.png*
    - *image_3.png*
  - **Task Description**
    Contains file(s) which describes the overall sub-task
    - *Task Description.pdf*

- **Task 1.3 - Bot Traversal**
  This sub-task focuses on a complete traversal of the bot. Given is a video of the bot traversing an Arena and the bot is marked with an Aruco Marker on top which can be seen as the bot traverses. Your task is to detect and follow this Aruco Marked bot for one complete revolution around the Arena.
  This folder contains 4 sub-folders.
  - **Codes**
    Contains the program files(s).
    - *main.py*
  - **Generated**
    This folder is where you'll save the images/results from your task.
  - **Videos**
    This folder contains the bot traversal video to work with
    - *Aruco_bot.mp4*
  - **Task Description**
    Contains file(s) which describes the overall sub-task
    - *Task Description.pdf*
    - *ArUco_library.pdf*
    - *Getting_started_with_ArUco.pdf*
    - *Introduction_to_OpenCV_Python.pdf*
    - *Reading_Material.pdf*

## Submission Instructions

**First Deadline(13th November 2019):**

Create a folder named ***SB#XXXX_Task1*** where ***XXXX*** stands for team ID. Place your **Codes** and **Generated** folders once you have finished all your tasks in the respective **Task1.1** and **Task1.2**. Now place **Task1.1** and **Task1.2** folders in the folder named ***SB#XXXX_Task1*** that you created. Now, zip this folder and upload it on the portal as instructed. Thus for example if your team ID is 9999 the folder will be named ***SB#9999_Task1*** and the zipped folder will be ***SB#9999_Task1.zip***

**Second Deadline(26th November 2019):**

Create a folder named ***SB#XXXX_Task1*** where ***XXXX*** stands for team ID. Place your **Codes** and **Generated** folders once you have finished all your tasks in the respective **Task1.3** folder. Now place **Task1.3** folder in the folder named ***SB#XXXX_Task1*** that you created. Now, zip this folder and upload it on the portal as instructed. Thus for example if your team ID is 9999 the folder will be named ***SB#9999_Task1*** and the zipped folder will be ***SB#9999_Task1.zip***

**NOTE: *"testsuite" will be uploaded at the following link by 7th November 2019 EOD. This will help in evaluating the requested outputs before uploading your results on the portals***