



The Rule of 2026 FIRA “AiBOT See-Grab-Place Challenge” Version – 2.0



Prepared By:

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TASK

Each team shall consist of 2 students.

The robot is required to complete tasks autonomously by detecting objects (capturing images or scanning), grabbing the identified object, and placing it in a designated room based on correct object recognition.

RULES

1. **Robot Limitation:**

- Each team is limited to **ONE robot ONLY**.
- **Maximum size** of the robot: $281 \times 306 \times 141$ mm (L $\times$ W $\times$ H).
- Measurement is taken during Robot Inspection.
- Any robot exceeding the size limit is **NOT** allowed to compete.
- Robot size includes all mounted parts (e.g., LiDAR mount, camera mount, speaker casing).

2. **Robot Requirements:**

The robot used **MUST FOLLOW** below requirements:

- Must utilize ROS (Robot Operating System).
- Equipped with camera or scanning sensors for object detection.
- Includes robotic arm and gripper for object manipulation.
- Uses SLAM (Simultaneous Localization and Mapping) for navigation.
- Lidar (Light Detection and Ranging)

3. **Autonomy & Control Rule:**

- Robots must **function autonomously** after the start signal.
- Once the robot starts, participants are **NOT** allowed to directly control or interfere with the robot movement.
- Manual control, direct intervention, or remote control is strictly prohibited.
- Violation may lead to **DISQUALIFICATION** (referee decision).

4. Gameplay:

- 4.1 Place the robot on the **START** room, and all team members should place their PC at the specified location.
- 4.2 When referee signals start, time begins.
- 4.3 Scan **COLOR** to determine the object to be lift.
- 4.4 The robot **must navigate** based on **COLOR** that has been **SCAN**
- 4.5 Name of all **4 (FOUR) rooms** and **objects to grab** are predefined based on Table 1 below:

Table 1: Room Colours and Objects

ROOM	COLOR	OBJECT TO GRAB
0	START	U SHAPE BOARD
1	BLUE	-
2	YELLOW	-
3	RED	-

- 4.6 The robot **must navigate** through the rooms based on the **COLOR** that has been scanned, completing the **required tasks** (detection, grabbing, and placement).
- 4.7 If an **object falls** in the **start room**, then the robot **must restart from the start point**. If the robot has picked up the object and touched the **checkpoint (CP1) before falling**, it can **restart from the checkpoint (CP1)**.
- 4.8 Random checks by referees will ensure adherence to the rules.

5. Mission Tasks:

*All the object to be lift will be in the specific place in **START ROOM**.

- **Task 1:** Start from the **START** room and scan colour 1.
- **Task 2:** detect and grab the assigned object.
- **Task 3:** Go to designated room colour.
- **Task 4:** Put the object on the A5 paper.
- **Task 5:** scan colour 2.
- **Task 6:** detect and grab the assigned object.
- **Task 7:** Go to designated room colour.
- **Task 8:** Put the object on the A5 paper.
- **Task 9:** Scan colour 3.
- **Task 10:** detect and grab the assigned object.
- **Task 11:** Go to designated room colour.
- **Task 12:** Put the object on the A5 paper

6. Mission Points:

- Completed Task 1: **5 points**.
- Completed Task 2: **10 points**.
- Completed Task 3: **10 points**.
- Completed Task 4: **5 points**.
- Completed Task 5: **5 points**.
- Completed Task 6: **10 points**.
- Completed Task 7: **10 points**.
- Completed Task 8: **5 points**.
- Completed Task 9: **5 points**.
- Completed Task 10: **10 points**.
- Completed Task 11: **10 points**.
- Completed Task 12: **5 points**.
- Completing all tasks successfully (success for all room): **Bonus 10 points**, making a total of **100 points** available.

7. Deduction Points:

- **Room Accuracy:** Each robot must be commanded based on the colour that has been scanned. **Deduction of 5 points** for incorrect room colours used.
- **Touching the Robot:** Once the robot starts, any instance of a team member touching the robot will result in a **deduction of 5 points**.
- **Robot Autonomy and Remote Control:**
 - **No Touching:** Participants are not allowed to contact the robot(s) during a test, unless required naturally by the task.
 - **Natural Commands:** Commands resembling direct control are forbidden.
 - **Remote Control:** Remotely controlling the robot, including pressing buttons or influencing sensors on purpose, is strictly prohibited.
 - **Penalties:** Disregarding these rules will lead to disqualification for a specific test or the entire competition.

8. Timing and Trials:

- Each team is allocated **30 minutes for preparation** and **complete all tasks (2 TRIAL GIVEN)**.
- Trials must begin from the starting point, with results based on the best-scoring attempt.

9. Scoring:

- Points are awarded based on task completion, accuracy, and timing.
- The fastest teams earn higher rank bonuses based on completion time.

10. Tiebreaker Regulations:

- Ties will be resolved by:
 1. Completion time (faster time ranks higher).
 2. Fewer penalty points accrued.

11. Start Signal:

1. The robot starts upon receiving the **start signal**, which can be:
 - When referee signals start, time begins.
 - Robots move only after scan the colour card.
2. Referees determine the success of each task based on accuracy and compliance with rules.

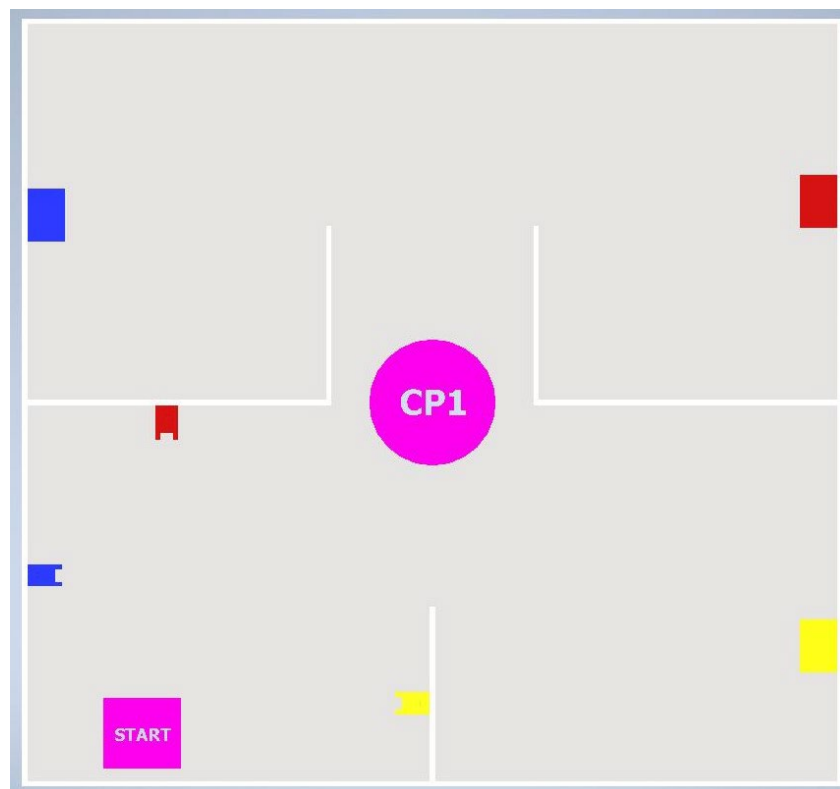
12. Object Identification:

1. Each object in the rooms will be marked with either:
 - A **symbol/image/sticker colour** for visual identification.
2. Robots must be capable of detecting and processing identification type for task completion.

Good luck to all participants!

Field Specifications:

- **Play Field Size:** 380 x 320 cm.
- **Surface Material:** Black carpet.
- **Walls:** 30 cm height, white color.
- **STOP POINT:** A circular area with an 80 cm diameter.
- **Parking U Shape Board:** Maklumat lanjut-
<https://drive.google.com/drive/folders/1VGTSJaDY3apiyduMa6-SYLzHgkP5S3Wz?usp=sharing>



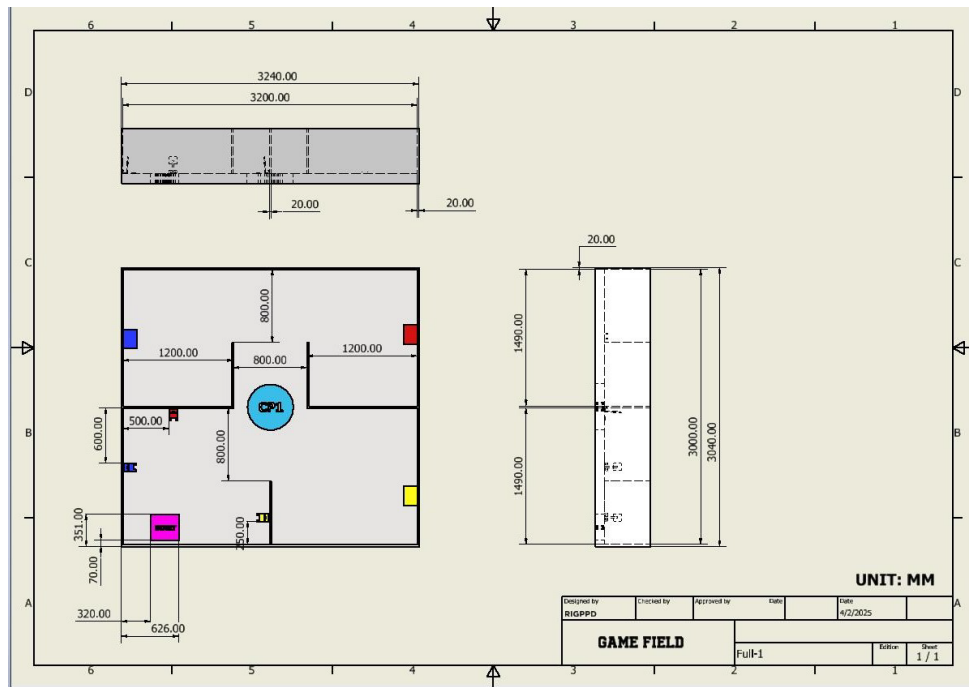
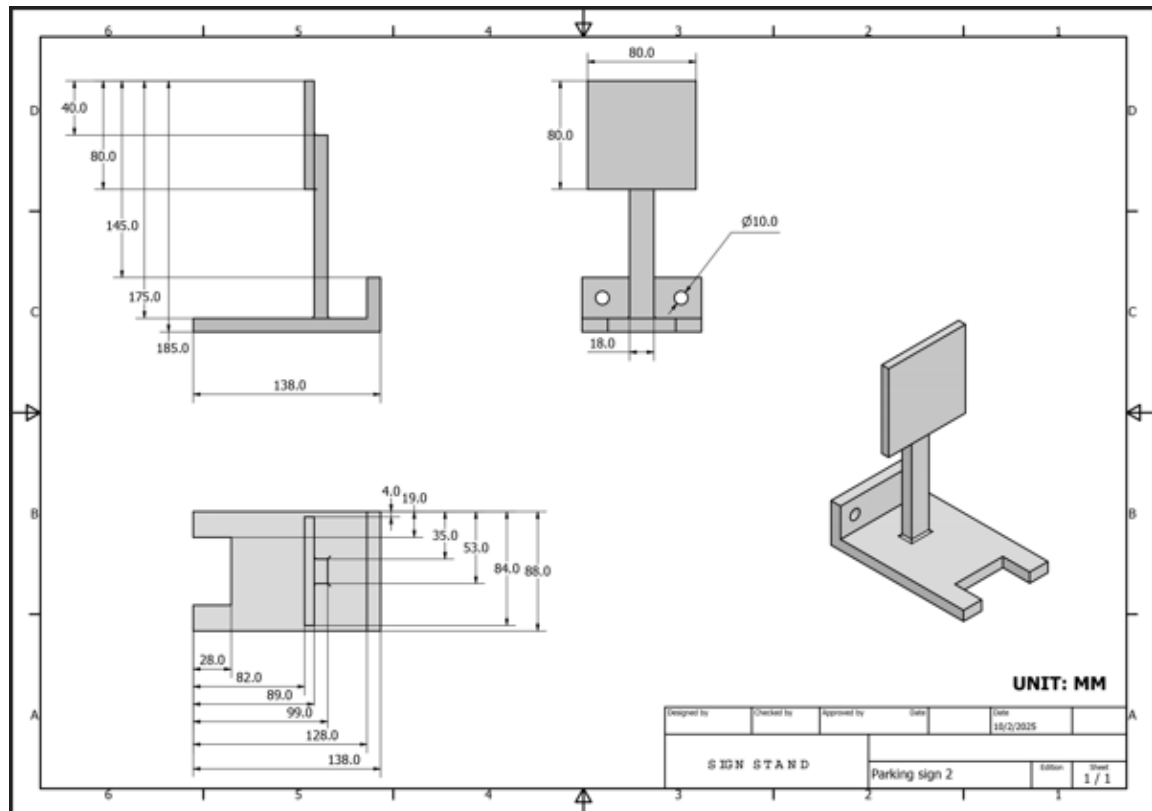


Figure 1. Playing Field Specification



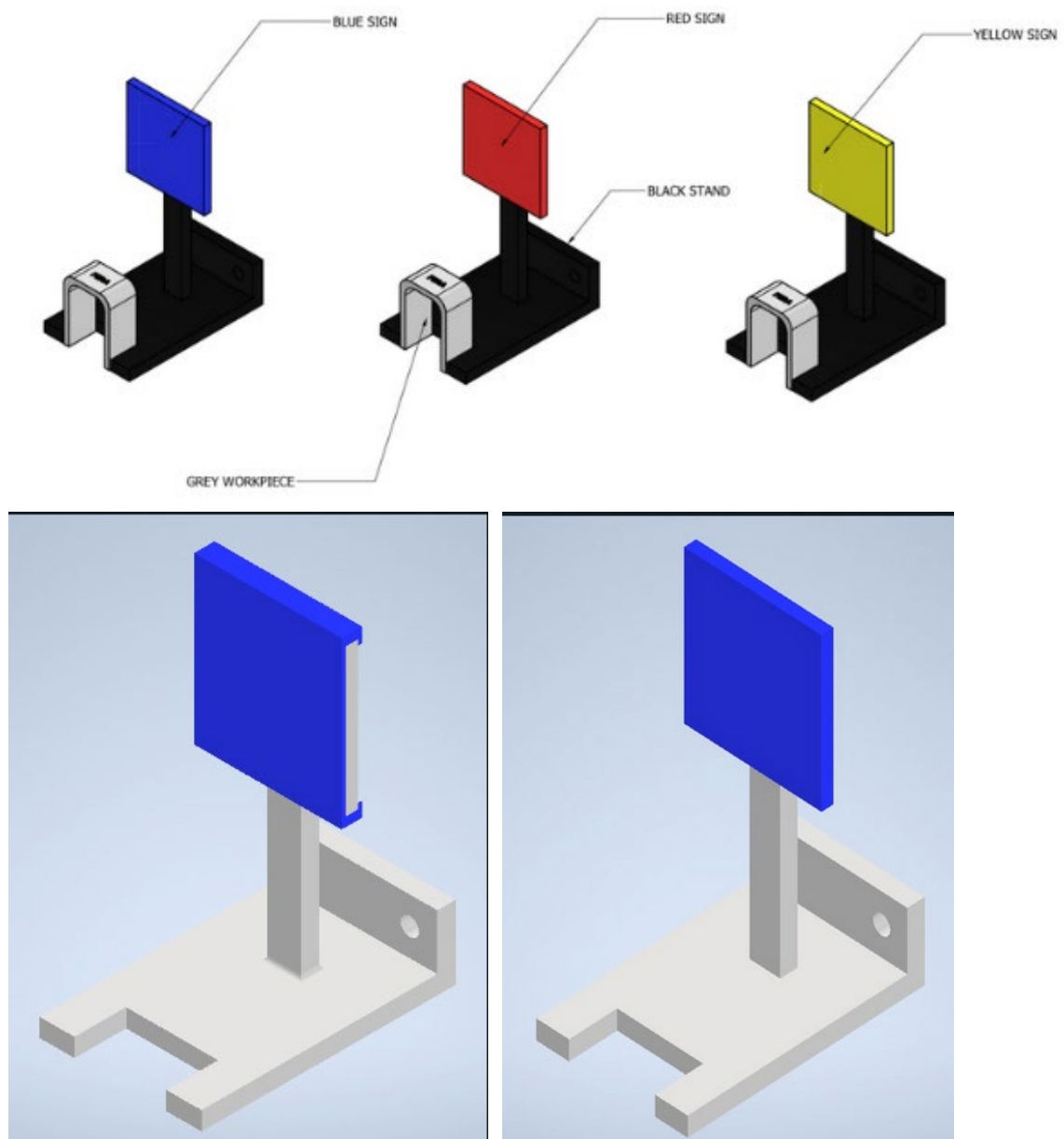


Figure 2. Parking Sign Blue, Red and Yellow

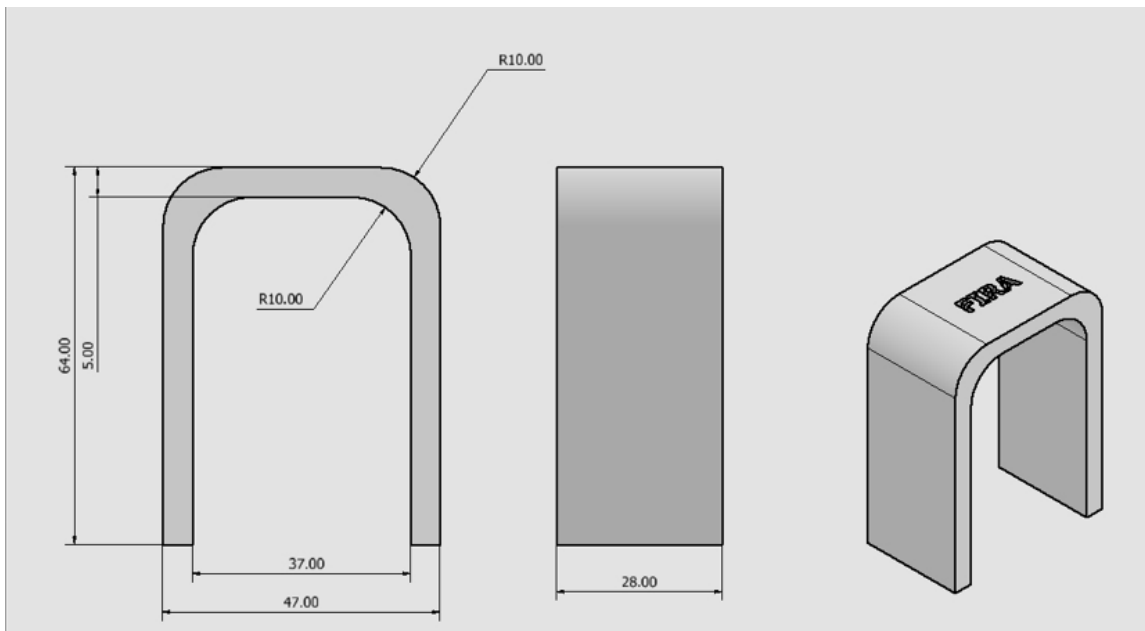


Figure 3. U Shape Board



<https://chat.whatsapp.com/CIYPhLeNNLXAvMVIFV14aC>