REGULATIONS «COLOUR PICKING»

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1. Introduction

The Colour Picking challenge was organized for the first time in ROBOTEX CYPRUS in 2018 by ENGINO. This interesting challenge has been extended to include the LEGO platform as well.

2. Objective

The objective of the challenge is for the competing robots to collect as many cubes as possible and transfer them at a specific location on the field and at the same time to maximize the total number of points with which the cubes are represented with.

3. The Team - Eligibility for Participation

1. The challenge accepts participation of teams and not individuals.
2. The team consists of two (2) – five (5) persons.
3. **Only one player** of category X is eligible to participate in a team of the immediate higher category. That is:
    - A player of category «4th – 6th Grade Primary» is allowed to participate in a team of category «Gymnasium»
    - A player of category «Gymnasium» is allowed to participate in a team of category «Lyceum»
4. The opposite of the rule 3.3 above does not apply. That is, one player of category X is not allowed to participate in a team of any lower category. For example, a player that belongs in category «Lyceum» is not allowed to participate in a team of category «Gymnasium» or «4th – 6th Grade Primary».
5. The coach of the team is not allowed to participate in the same competition with his/her team.
6. The team defines one of its members as a leader who will be responsible for the communication with the Organizing Committee, the judges, for the technical control process and for operating the robot during the competition.

4. The Field

1. The field is of size (2 meters length x 2 meters width) with the surface having white colour.
2. The perimeter of the field has a black colour of up to five (5) cm.
3. At one end of the field there are two (2) areas for cube collection. These areas are of grey colour and twenty-five (25) centimetres wide.
4. Within the cube collection area there is an entry point from where the robot will enter the field.
5. There are twenty (20) specific positions for positioning the coloured cubes on the field.
6. There will be no separate field for testing the robots before the competition. Participating teams will be able to use the normal track for one (1) hour before the start of the formal competition.
7. See a sample field in the APPENDING – SAMPLE FIELD (page 11).

5. The Robot

1. The robot can be ENGINO ERP, ENGION E40 STEM & Robotics Produino, LEGO EV3 and LEGO SPIKE.
2. The robot must be autonomous.
3. The robot must not destroy the field or to be of threat to the players or the spectators in any way.
4. The robot must be constructed with original parts of the respective platform.
5. The robot must only use only batteries or cells as recommended by ENGINO or LEGO respectively, preferably rechargeable batteries.
6. For purposes of orientation the robot can use a compass.
7. The robot must fit within the starting area that has dimensions 25cm x 25cm. There is no limit for the height of the robot.

6. The Cubes

1. The dimensions of the cube are 5cm x 5cm x 10cm height.
2. The weight of the cube is 115 grammars.
3. You can see samples of the cubes at the picture here.

7. Skills Required

1. To be successful in this challenge, the following skills are essential:
   - Finding orientation
   - Colour Recognition
   - Obstacle detection and avoidance
   - Detection of black line and to remain within the field
   - Modular construction.

8. Categories and Levels

The competition is executed for the platforms ENGINO PRO, ENGINO Produino, LEGO EV3 and LEGO SPIKE for the categories and levels below:

Table 1: Categories & Levels for COLOUR PICKING

Category →	Primary	Gymnasium	Lyceum
Level	$4^{th} – 6^{th}$	$1^{st} – 3^{rd}$	$4^{th} – 7^{th}$
Colour Picking	√	√	√

9. The Competition

1. Each robot accesses the field for two (2) rounds.
2. The duration of the round is three (3) minutes.
3. Ten (10) cubes of three (3) different colours are placed on the field in fixed positions.
4. The number of coloured cubes to be placed on the field are as follows:

Cube Colour	Number of Cubes
Green	2
Blue	6
Red	2

5. Each colour has a different degree. Green and blue cubes have positive grades and red negative grades as follows:

Cube Colour	Points
Green	+3
Blue	+2
Red	-4

6. The ten (10) coloured cube positions between the twenty (20) specific positions will be decided by draw. For the purpose of equal treatment of the teams, the ten (10) positions to be drawn will apply to all robots for all rounds. Therefore, after the draw the competing robots will be placed in quarantine and will be given to the leader of each team only to take part in the competition.
7. Judges will place the cubes in the positions to be drawn on the track.
8. The robot enters the track from the entry point. The robot orientation is decided by draw.
9. The robot must move within the range of the field defined by the external black line.
    - If only part of the robot moves outside the black line, the robot can continue moving.
    - If the robot comes out completely out of line, then the robot stops and its points are recorded in the system for this round.

10. The robot will have to find the coloured cubes with the positive points and transfer them to the collection area.
11. If the robot transfers a red cube to the collection area, then the four (4) points of the red cube are deducted from the total points of the robot.
12. If the red cube moves from its position but is not placed in the collection area, then points are not deducted from the robot.
13. If the robot stops at a point and can't continue, the team leader is entitled to reset it so that it continues. In this case:
    - a point is deducted from the total score of the robot
    - the robot is placed at the starting point
    - the time of three (3) minutes for the round continues to count.

10. Declaring the Winning Team

1. At the end of the two (2) rounds for all robots, the points that each robot gained in the two (2) rounds are summed up.
2. Only cubes whose entire surface is in the assembly space will be considered in the count.
3. The ranking will be realized for each category based on the total number of points of the robots.
4. The robot that collected the highest score per category will be considered the winner.
5. In case of a draw, then another round is executed amongst the robots with equal points. The points of each robot are added to its points of the second round so that the ranking is decided.
6. The first robot team of each category will be promoted to the final round (best-of-the-best).
7. In the final round, the robots will compete in one (1) round for the final ranking and to declare the robot winning the competition according to points 9.5 and 9.6 above.

11. Terms and Conditions of Participation

1. Participation in ROBOTEX CYPRUS assumes and requires acceptance of all terms and conditions for participation by competitors, the coaches and the organizations they represent.
2. In case of any difference in the competition rules between the English and the Greek versions, the English version is considered as correct.
3. The robot must be registered before the competition. The registration process includes technical inspection of the robot, marking the robot with a number sticker, and the order in which it will compete which is generated by an algorithm in the information system supporting the ROBOTEX CYPRUS organization.
4. In this challenge, there are two (2) judges. An additional head judge may also be present to supervise the whole process.
5. All questions and issues that may arise during the competitions must be reported to the judges.
6. The final decision about objections will be taken by the judges in cooperation with the organizers.
7. Judges' decisions on any objections are considered final and can't be challenged by participants, the coaches or the organizations they represent.
8. In the case of a deliberate alteration or change of marking of the unique number of robots, the coach and his team will be automatically expelled from the event. As a result they will not be able to take part in any other challenge they may have enrolled. The coach and his team will leave the venue immediately. The coach also loses the right to take part in the next ROBOTEX CYPRUS event and is automatically excluded from participating in ROBOTEX INTERNATIONAL in case one of his/her teams has won a ROBOTEX CYPRUS competition. The Organizing Committee reserves the right to publicly announce the coach, the team and its members.
9. It is expected that both the coaches and the members of the teams will exhibit a spirit of noble rivalry and will behave with mutual respect, decency and esteem both to themselves and to the organizers, judges and volunteers. The behaviour of all coaches and team members should promote "fair play". Therefore, the Organizing Committee reserves the right to expel anyone from the venue of the event who violates the above principles of good practice.

12. Robot Technical Control

1. An initital technical control of the robot technical control will take place on the day of the competition at an area and on time specified by the organizers.
2. Technical control takes place before each phase of the competition (preliminary, qualifying, final) in which the team may participate.
3. Failure of a team to come in time for a robot's technical check leads to the team being excluded from the event.
4. The leader of the team only is responsible to take the team's robot for technical control.
5. Technical control includes the control of the robot based on the above and the section «**5. The Robot**». If the robot does not meet the requirements it will not be accepted to compete and will automatically be disqualified from the event.

13. Note - Participation in Robotex International

1. The Colour Picking competition is not organized at Robotex International in Estonia. The Organizing Committee of Robotex Cyprus has already requested the Robotex International Organizing Committee to include the Colour Picking competition in the Robotex International event and awaiting the decision.
2. If this is not possible, the Robotex Cyprus winning team in the Colour Picking competition will be entitled to participate in the Estonian mission as observers, ie without competing. To this end, we suggest that all teams participating in Colour Picking, also participate in an additional competition(s) held at both Robotex Cyprus and Robotex International, so that, if they also win in such competition in Cyprus, to be able to actually participate in the corresponding competition in Estonia.

14. Changes and Cancellation of Rules

1. Any changes and/or cancellations in the rules of the competition are decided by the Cyprus Computer Society in consultation with the Organizing Committee of ROBOTEX Cyprus. You may address comments and suggestions to the Organizers at **robotex@ccs.org.cy**.

APPENDIX – SAMPLE FIELD