

# Toy Cleanup

Task of the robot is to clean the room where toys are spread all around.

## 1. Contest description

After being started, the robot has to travel across the playing field, clean up and sort the toys and returns back to the starting place. Robots are ranked based on the score they achieved during the cleanup.

Before the start, the participants prepare the robot so that it touches the back wall of the starting area. Since then, no intervention is allowed. After the preparation, the referee spreads the toys somewhere in the target area. The participant starts the robot on a referee's signal. Then, time is measured from this signal to the moment when the robot returns back where it started. If this time exceeds the time limit, the referee will terminate the race and the robot will get penalized one negative point for each partial 10cm missing back to start.

The organizers may allow repeating races or rounds; the best score of all attempts of a robot will be used for ranking in this first part of the contest. In the finale part, the races will be held on a knock-out basis.

## 2. Robot

The robot must not be dangerous or excessively annoying.

On its top side, an emergency switch must be located. By pressing it all actuation must be switched off. The switch must be big enough and well distinct so that it can be easily recognized. It must be also easy to be reached and intuitively used.

A 10x7 cm space for marking must be reserved on the robot's top side.

At start time, the robot must fit inside the starting area; otherwise, its size is not limited.

**Beginner Category:** The robot may be remotely controlled. In case of wired (cable) connection, such cable must be long enough so that the driver does not pull the robot. In case of a wireless connection, no objections concerning the connection, its quality, or drop-outs are allowed. It is not allowed to use any kind of jamming or signal disturbing technologies even if they were law and regulation compliant. This category is for beginners only; those who have already participated have to compete in Advanced category (except of adult non-playing supervisors). The time limit for a run is 2.5 minutes.

**Advanced Category:** The robot is autonomous. Throughout the race (including the start) no external connection is allowed. Since the robot is prepared for start, it must not be touched or interfered with in any way except starting until the referee allows so. The time limit for a run is 5 minutes.

## 3. Playing field

Playing field ground is white. The playing field is bordered and contains inner walls forming a "meander". Both the border and the inner walls are approx. 10 cm high. The robot must not pass or "lean" over the walls but it may "look" over them. The robot starts from the back side and the toys are spread in the front side of the playing field (see the picture; the hatching and the blue lines are not drawn on the playing field and serve here only for explanation).

## 4. Toys

The toys are represented by differently coloured cubes (red, green, blue). The cubes are wooden, weighting ca. 20-30 g, and their edge is about 3.7 cm long. In the game, there are 20 cubes of each colour. The cubes are to be sorted to three destination areas bordered by black line in the front part of the playing field (top of the picture, from left to right red, green, blue). Every cube which is fully in the correct area (same colour) after the robot returns counts for 1 point, every cube placed at least partially in wrong area (different colour) counts for -1 point. The back part of the destination area (about one third) is elevated by couple of centimetres. Placing cubes there doubles their points (positive as well as negative). In case of a tie, the winner is decided based on time or other appropriate method set by the organizers.

