

Sumo Challenge



Bear Rescue Regulations



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1. Short description of category

In this category the purpose of the robot is to detect a small teddy bear in a simple maze and transport it to the destination.

2. Course of the game

The robots start the game in the designated starting area (which is also the ending area). At the sign given by the judge, robots begin the game. The goal is to find a path on the field (which is a simple maze) leading to a small teddy bear on the other side. When the bear is detected, robot has to transport it to the starting point. On its way back, the robot doesn't have to use the same route as it used to find the bear. The goal is to complete the task in the shortest possible time.

3. Completing task

Robots can perform the task in two ways: autonomously or with a help of remote control.

- a) The autonomous robot must perform the task without operator assistance. The robot can use communication with an external computer to perform the program and calculations, however it is prohibited to use operator assistance. The robot moves on the field using sensors.
- b) Remote-controlled robots can also take part in this competition - in this case it is allowed to give robot control commands in any way (e.g. using Bluetooth, infrared or radio communication) by one or two operators. Giving orders must be done wirelessly, meaning no physical contact with the robot on the field is allowed.
- c) At the final classification of the competition, robots that have completed the task in a fully autonomous manner will be promoted.

4. Field description

- a) The field for this competition has an overall dimension of approximately 2.8 m x 1.5 m (*Fig. 1*). There might be minimal gaps and unevenness on the ground, which, however, should not have any impact on the robots that take part in this competition.
- b) The starting area (and also the ending area) is located in the bottom left corner of the field and has walls on three sides. The walls on the field form a simple maze. The upper half of the field does not contain any walls and is the space in which teddy bear is located
- c) All walls are 10 cm high and 1.2 cm wide. The robot can scan the area over the surface of the walls, but while performing tasks must travel through the maze - it is not allowed to jump over and drive over the walls, or to damage them on purpose. The whole field (both ground and walls) is white.

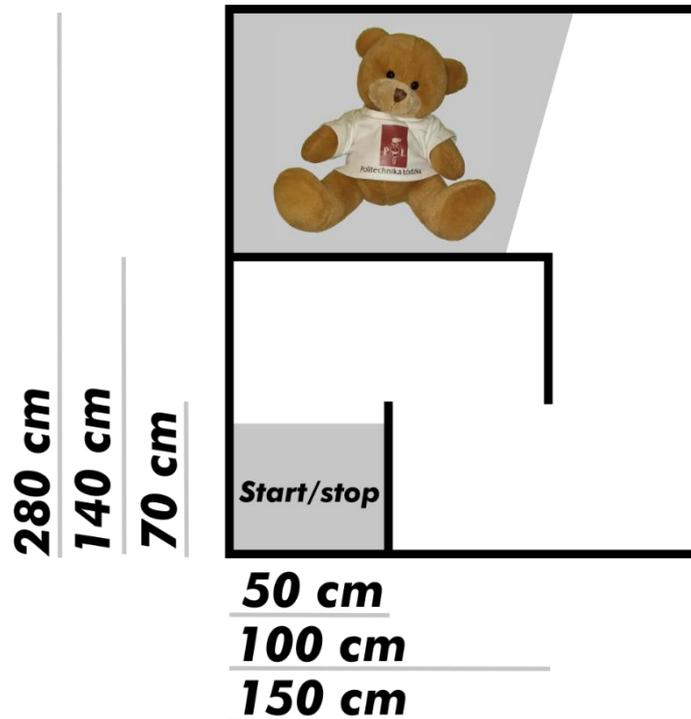


Figure 1 Field dimensions

5. Robots

Robots do not have specific dimensions requirements. They can be of any height and width, however participant should pay attention to the width and height of passages on the route. Because of the ground's material, the weight of the robot may not exceed 5 kg (although robots with lower weight are expected).

6. Autonomous methods of going through the maze

Robots can go through the maze in any way. They can use terrain mapping and driving along the programmed route or by staying at a suitable distance from the walls. To simplify competition, there will be a black 19 mm wide line (made of black insulating tape) that robots can use. However, the detection of the bear itself may require additional sensors (touch, distance or other), which may be within a radius of 40 cm from the end of the line).

7. Transfer of the teddy bear

Robot can transport the bear in any way: pushing, holding in the gripper or pulling it. The task is completed when the teddy bear is completely in the starting area.

8. Dimensions of the teddy bear

The dimensions of the bear are not clearly defined - in the sitting position, the bear should be about 15-20 cm high, although it is suggested to place a gripper (or other element dedicated to moving the bear) at a height of not more than about 12 cm above the ground. Two different types of teddy bears can be used in the competition - so that the team can choose a more suitable one before the start.

