RoboCup Rescue 2022
Draft Rulebook
Part 7: Outdoor Carrybot

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Outdoor Carrybot: **2**

Outdoor Carrybot:

The Outdoor Carrybot Challenge simulates the transport of goods in a large-scale outdoor environment by an autonomous robot. The robot has to follow a given path and avoid obstacles in its way. To ensure comparable results, the Outdoor Carrybot Competition will only be held at the in-person event.

Preparation

- Required tools
  - Chalk to mark waypoints
- Find an appropriate outdoor environment
  - can be closed off for the competition
  - larger space that can contain a path with a length of 300 - 500 m
  - Ground: asphalt, gravel, trimmed grass
  - Potential obstacles: curbs up to 20 cm in height, bollards, walls, vehicles, holes and similar obstacles found in outdoor environments
- Define waypoints on the ground marked by boxes of 3x3 meters and assign a letter to each
- Depending on the environment, the waypoints should be set up in the following way:
  - The first 3 waypoints should connect directly, without obstacles in the way
  - The connection between later waypoints should include obstacles with increasing difficulty that have to be avoided or traversed (see potential obstacles above)
  - Waypoints have to start in open space, but if possible, mark 1-2 waypoints later in the track in GPS-denied environments
  - About 10 waypoints in total with a total travel distance of 300 - 500 m
- We schedule testing slots for teams ahead of the competition
  - Teams can use the time to teach the marked waypoints to their robot (e.g. saving GPS or SLAM coordinates)
  - Waypoint order is only published at competition time and not known during the testing slots

Procedure

- Teams do not need to use their primary robot, this is a separate competition
- An ordering of waypoints is decided (the same for all teams) which forms a looping path
- Teams get the waypoint order as letters
- Each team gets one time slot of 30 min
- The robot starts inside the starting waypoint and has to autonomously drive through the waypoints in the given order
- The robot can not skip waypoints, the path has to be followed in the exact given order
- After the robot starts driving, any interaction with the robot (remote or physical) is considered a reset
- Each cleared waypoint (excluding the starting point) gives 1 point

- ○ A waypoint is cleared if the robot touches the marking on the ground
  - ○ The robot does not need to be fully inside the box
- The path is a loop so teams may keep going if they still have time after returning to the starting waypoint
- Within their time slots, teams can perform a reset any time to start from the beginning without a time penalty.
- During a reset, teams can fully interact with the robot (e.g. tele-operating back to the start or carrying the robot)
- A reset marks the end of the current run and the achieved score is written down. There is one separate score per run
- The highest score from all the runs will be counted as the final score

Outdoor Carrybot Challenge – Score Sheet

Waypoint Order

This information will be given ahead of your run

A	C	B	A	…					

Scores