RoboCup Rescue 2022

Draft Rulebook

Part 3: Mobility

Version 2022-04-14

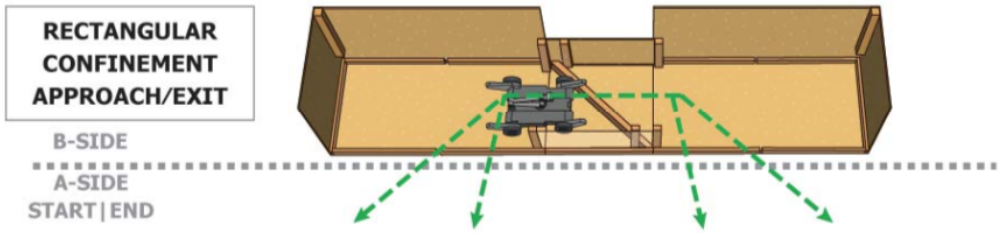
Mobility:

5 tests for driving over terrain with medium to hard difficulty (all tests are considered for a robot to win Best in Class Mobility). Robots are allowed to turn around (change direction) and complete the test facing in whichever direction they wish. All teams (remote pre-recorded, remote live telecon, and in-person) have the same time limit within which to complete as many repetitions as possible.

The lanes are divided into an A-Area (or A-Side), where the robot is “off the test” and can turn around if the test allows, and a B-Area (or B-Side) that is the actual test. Tests start with the robot entirely in the near side A-Area, driving into and through the B-Area, and then into the far side A-Area. Once the robot is entirely within the far side A-Area, for Mobility tests it may turn around. It should then drive into and through the B-Area, and then into the near side A-Area. This is considered one repetition and scores one point.

(OBS 1) Variable Height Rails:

Motivation:
Evaluate the ability of the robot to traverse vertical obstacles at an angle.



Procedure:

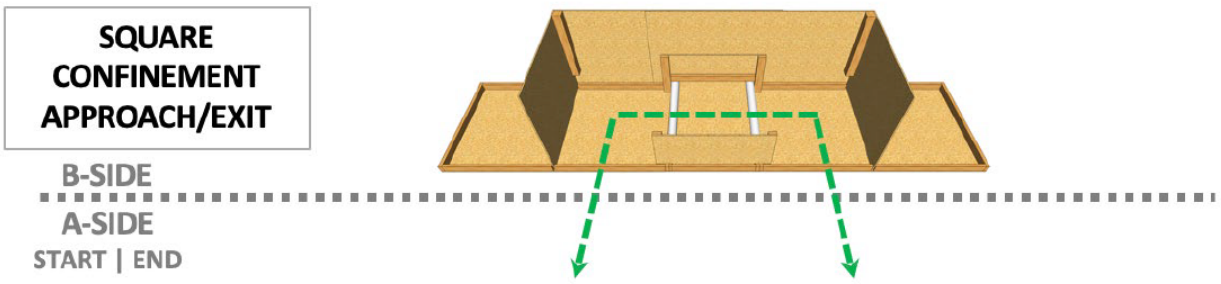
1. Set the height of the rail.
   a. The height is to be decided. It is likely to be at least 18 cm (7”) in height.
2. Ready robot on the A-Side.
3. The trial starts once the start signal is given or the timer is started.
4. Traverse forward from A-Side to B-Side.
5. Traverse across the beam following the prescribed path without touch the side rails, and over the rail at a roughly 45 degree angle.
6. Traverse forward from B-Side to A-Side.
7. Turn around and traverse forward from A-Side to B-Side.
8. Traverse across the beam following the prescribed path without touch the side rails, and over the rail at a roughly 45 degree angle.
9. Traverse in reverse from B-Side to A-Side.
10. Successful repetition is counted when the robot completely passes into the A-Side (Near end).
11. Record successful repetition on the scoresheet
12. Repeat until the end signal or the timer has elapsed.
    a. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:

- None beyond the standard faults.

(OBS 2) Hurdles:

Motivation:
Evaluate the ability of the robot to traverse a vertical obstacle without gripping onto the leading edge.



Procedure:

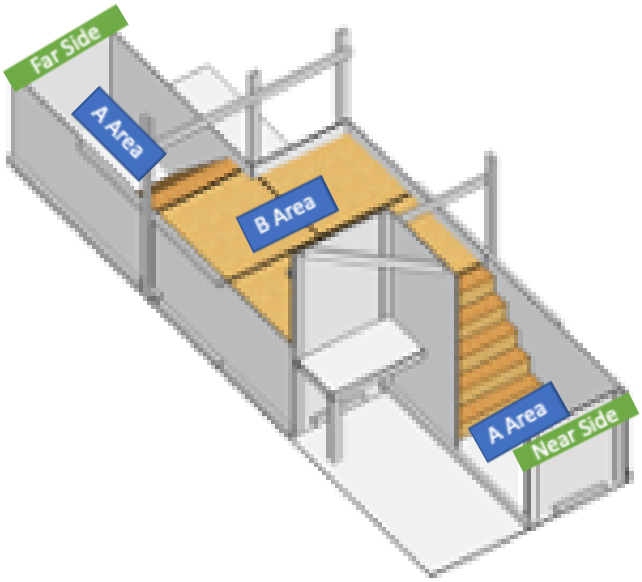
1. Set the height of the hurdle.
2. Ready robot on the A-Side
3. The trial starts once the start signal is given or the timer is started.
4. Traverse forward from A-Side to B-Side
5. Traverse across the hurdle following the prescribed path without touch the side rails
6. Traverse forward from B-Side to A-Side
7. Turn around and traverse forward from A-Side to B-Side
8. Traverse across the hurdle following the prescribed path without touch the side rails
9. Traverse in reverse from B-Side to A-Side
10. Successful repetition is counted when the robot completely passes into the A-Side (Near end).
11. Record successful repetition on the scoresheet
12. Repeat until the end signal or the timer has elapsed.
    a. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:

- None beyond the standard faults.

(OBS 3) Stair with Optional Debris:

Motivation:
Evaluate the ability of the robot to traverse 35º and 45º stairs with obstacles.



Procedure:

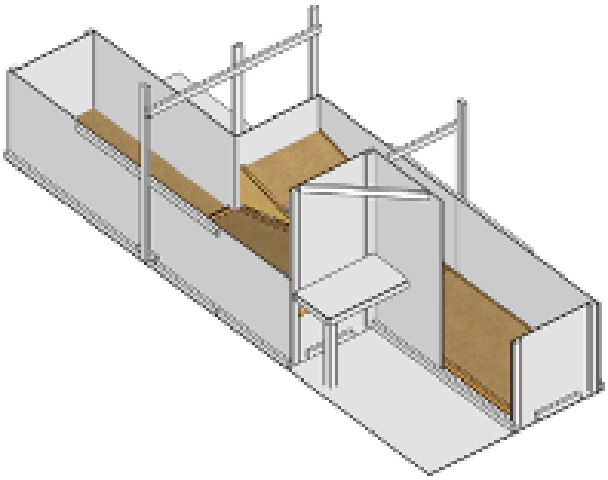
1. Ready the robot within the A-Area (Near Side) .
2. The trial starts once the start signal is given or the timer is started.
3. Traverse forward from A-Area (Near Side) navigating thru B-Area to A-Area (Far Side)
4. Turn around and traverse forward from A-Area (Far Side), navigating thru B-Area following the prescribed path to A-Area (Near Side)
5. Successful repetition is counted when the robot completely passes into the A-Area (Near Side).
6. Record successful repetition on the scoresheet
7. Repeat until the end signal or the timer has elapsed.
8. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

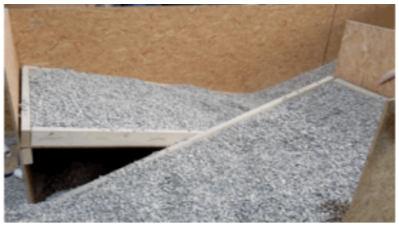
Test-specific Faults:
In addition to the standard faults:

- High Center?

(TER 1) Sand/Gravel:

Motivation:
Evaluate the ability of the robot to traverse sand and gravel on inclined surfaces.





Procedure:

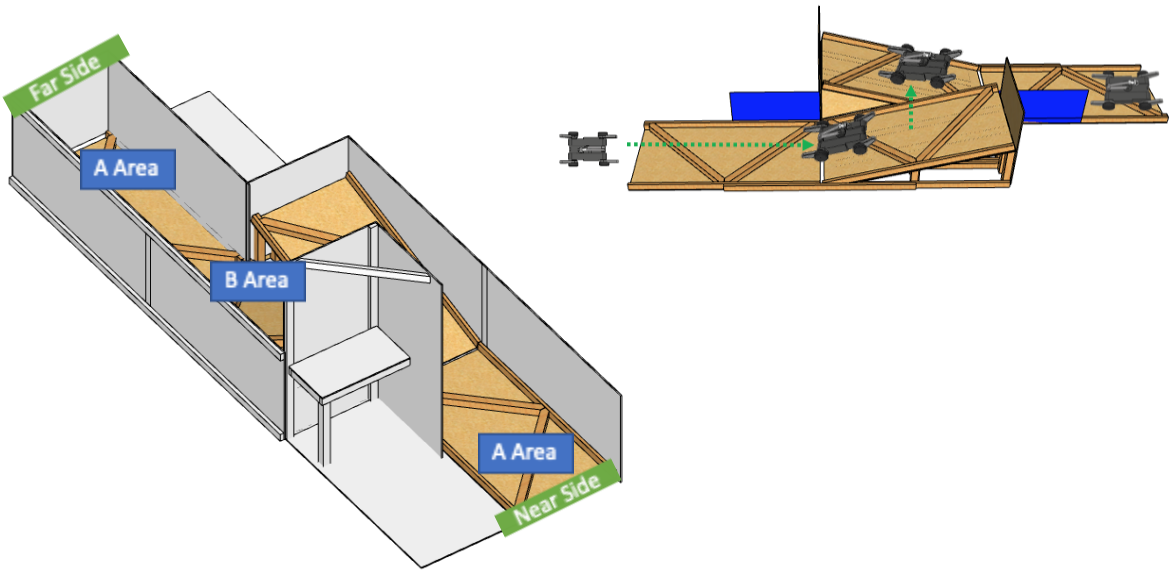
1. Ready the robot within the A-Area (Near Side) .
2. The trial starts once the start signal is given or the timer is started.
3. Traverse forward from A-Area (Near Side) navigating thru B-Area to A-Area (Far Side)
4. Turn around and traverse forward from A-Area (Far Side), navigating thru B-Area following the prescribed path to A-Area (Near Side)
5. Successful repetition is counted when the robot completely passes into the A-Area (Near Side).
6. Record successful repetition on the scoresheet
7. Repeat until the end signal or the timer has elapsed.
8. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:

- None beyond the standard faults.

(TER 2) K-Rails on Crossover Slope:

Motivation:
Evaluate the ability of the robot to traverse uneven terrain on inclines.



Procedure:

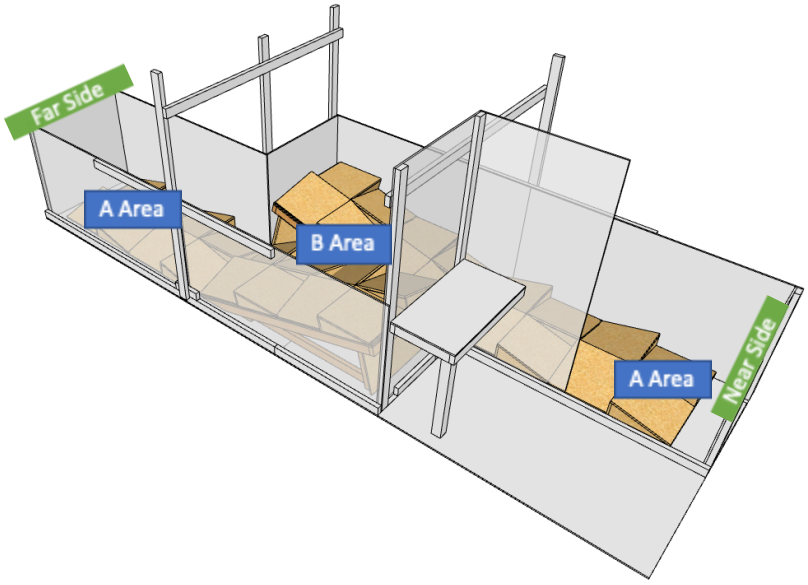
1. Ready the robot within the A-Area (Near Side) .
2. The trial starts once the start signal is given or the timer is started.
3. Traverse forward from A-Area (Near Side) navigating thru B-Area to A-Area (Far Side)
4. Turn around and traverse forward from A-Area (Far Side), navigating thru B-Area following the prescribed path to A-Area (Near Side)
5. Successful repetition is counted when the robot completely passes into the A-Area (Near Side).
6. Record successful repetition on the scoresheet.
7. Repeat until the end signal or the timer has elapsed.
8. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:
In addition to the standard faults:

- High center on the traverse over the incline, unable to move and requiring manual intervention: Considered a full reset.

(TER 3) Pinwheel Ramps on Crossover Slope:

Motivation:
Evaluate the ability of the robot to traverse difficult terrain.



Procedure:

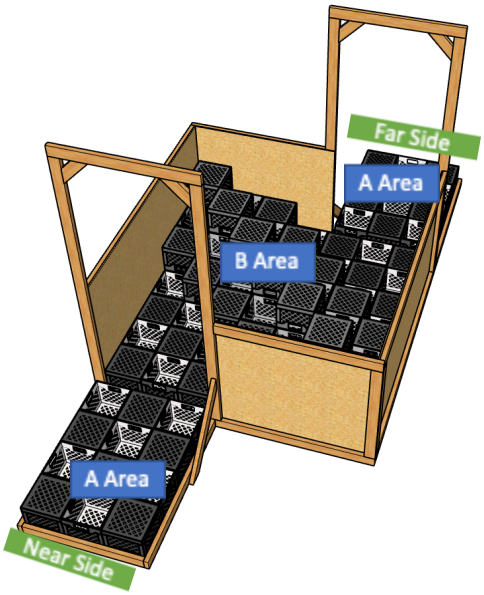
1. Ready the robot within the A-Area (Near Side) .
2. The trial starts once the start signal is given or the timer is started.
3. Traverse forward from A-Area (Near Side) navigating thru B-Area to A-Area (Far Side)
4. Turn around and traverse forward from A-Area (Far Side), navigating thru B-Area following the prescribed path to A-Area (Near Side)
5. Successful repetition is counted when the robot completely passes into the A-Area (Near Side).
6. Record successful repetition on the scoresheet.
7. Repeat until the end signal or the timer has elapsed.
8. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:

- None beyond the standard faults.

(TER 4) Crate Terrain for Legged Robots:

Motivation:
Evaluate the ability of the robot to traverse difficult terrain with both sensing challenges (.



Procedure:

1. Ready the robot within the A-Area (Near Side) .
2. The trial starts once the start signal is given or the timer is started.
3. Traverse forward from A-Area (Near Side) navigating thru B-Area to A-Area (Far Side)
4. Turn around and traverse forward from A-Area (Far Side), navigating thru B-Area following the prescribed path to A-Area (Near Side
5. Successful repetition is counted when the robot completely passes into the A-Area (Near Side).
6. Record successful repetition on the scoresheet.
7. Repeat until the end signal or the timer has elapsed.
8. For in-person and remote live telecon trials only: Perform the readiness test during the prescribed time.

Test-specific Faults:

- None beyond the standard faults.