GUIDE BOOK

WRC

ROBOT TRANSPORTER

Game Description

Transporter is a game that robot transport specified target to assigned goal in IISRO official playfield in
time. The robot who transports all targets and returns at time closest to given time will win the game. It is
essential to understandparticipant'sown robot fully, dynamics and physical laws about robot, sensor
control techniques, and programming in order to construct robot and program it.

CHALLENGES

Participants program transporter robots according to questions given by the committee and judges. The robots operate automatically with the push of a button.

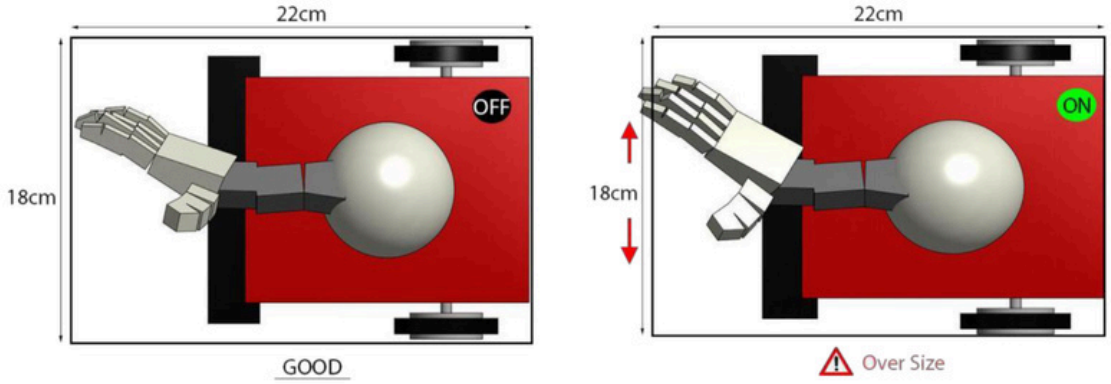
PARTICIPANT TERMS AND CONDITIONS

- The competition is open to participants from Indonesia and the Indonesian Foreign participants through the following categories :
  1. Junior Category [age of Under 12 years old]
  2. Senior Category [age of under 19 years old]

- Each team consists of a maximum of 7 participants including. Each participant (except assistant teacher/team manager) is only allowed to register join a team only.
- Team registration must be done online at the website.
- Eating & drinking are not provided.
- The Robot Kit is not provided by the committee
- The robot must be programmed using a laptop.

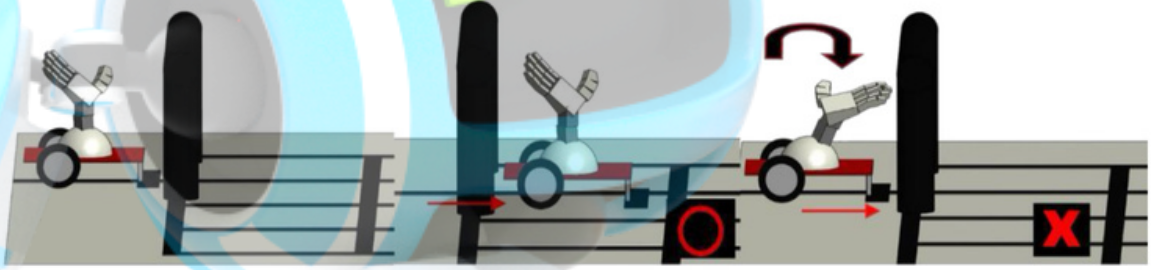
ROBOT RULE

- Robot type: No restriction
- Construction
  Size: robot should be smaller than 18cm x 22cm (W x L)



Game DescriptionSize measurement

1. Official inspection: Structure size will be measured on the measuring board before the competition and robot must be switched on to be measured.
2. Self-check: Participants should self-check the size during construction time and practice time
3. When it starts, robot must be same form as official inspection



Weight : No restriction
Sensor : No restriction

- Power source
  1. Robot should work with an independent electric power supply; it cannot use a combustible device.
  2. There are no limitations on type of battery or voltage level.

- Struktur es in mission
  Robot should include structure that can lift and transport targets.
- Programming and Control

Robot is not allowed to be programmed or controlled. Robot should not be touched after starting match.

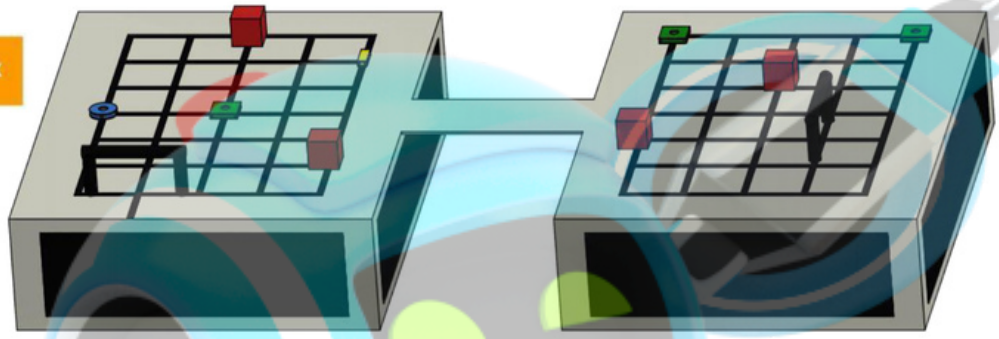
PLAYFIELD RULE

Playfield

- **Structure**

1. Size and placement Two blocks with size 160cm x 120cm(±10%) are connected by bridge.
2. Bridge is 25cm(±10%) wide, and may combine straight and curved lines.
3. Playfield may be inclined less than 2 degrees, and may have height or gap less than 0.3cm (±10%).
4. There is no acrylic wall around playfield.

Ex



- **Floor**

Floor is made of glossy coated PET. Color is white, and sheet may be added for IISRO logo or advertisement.

1. Line: Black line with 2cm(±10%) wide
2. Mission map
   - Placement of target, goal, and lines are subject to change according to league. They may include curved lines or straight lines.
3. Sheet or tape can be placed to remove gap of floor.

Target

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Target

- Type of targets

Pallet types(Right rectangle, Rectangle, Circular) and block types(Sphere, rectangular parallelepiped , sandglass, cone, cylinder)

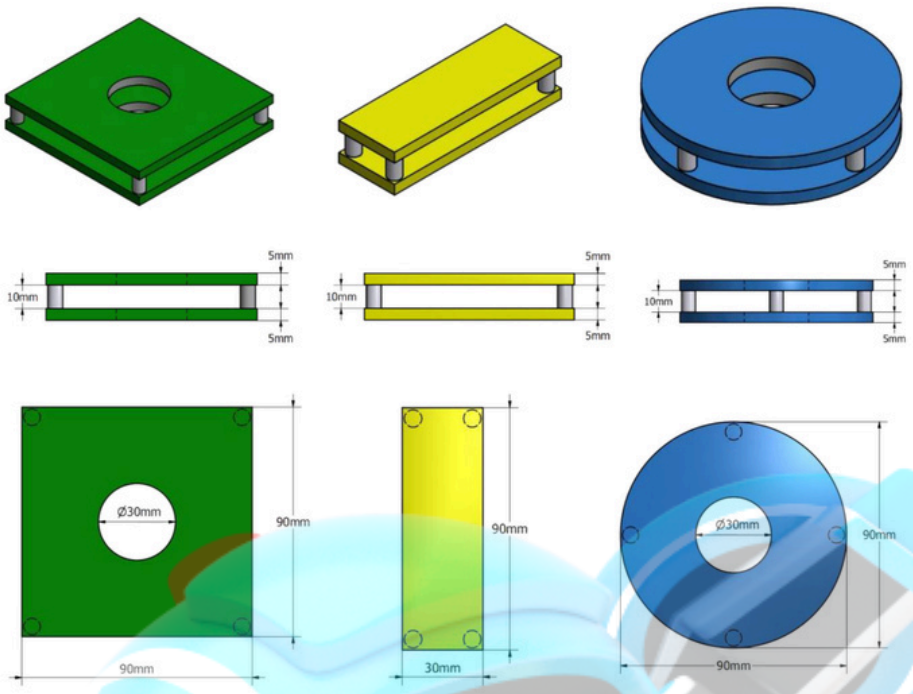
- Pallet type

Size of 9cm X 9cm X 2cm(WXLXH, ±10%), Weight less than 200g. Rectangles and Circles have 3cm diameter hole in the middle to place sphere targets. (±10%)

- Block type

Sphere : Standard size golf ball, Placed on prop with size 4cm X 0.5cm (diameter X height) (±10%)

Rods : Size 2.0~2.5cm X 2.0~2.5cm X 6.0cm (WXLXH), Weight less than 80g (±10%



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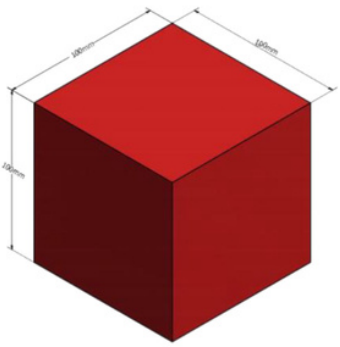
Goal

- Arbitrary crossway in passage is selected and specified in mission map. It is not specified in real playfield.
- After transporting target, if any part of target is on the goal, it is considered to be success. If target in first floor is not successful, then target in second floor is not also successful.

Obstacles

- Obstacles are cubes with size 10cm X 10cm X 10cm(WXLXH, ±10%), and they are fixed in playfield.
- If robot touches obstacles, then it is given 2 second penalty which later sum up with mission accomplishment time to make the time far from given time.

  If robot stops after colliding obstacles, then penalty is also given and TKO is announced



COMPETITION

- Match is placed in WIRC official playfield.
- This competition is recorded match(General Rule 3. Recorded match)
- Robot should pass starting point and follows line to place all targets in right goal by transporting them, and it should pass end point at time closest to given time.
- Mission notification

  Playfield, type of bridge, target and goal's position and number, structure of lines, mission, and given time will be notified in mission paper on-site and on match day.
- Mission accomplishment

  Targets should not touch floor during transportation, and order of
- transportation and route is not specified. Participant can choose them freely as long as he does not violate mission.

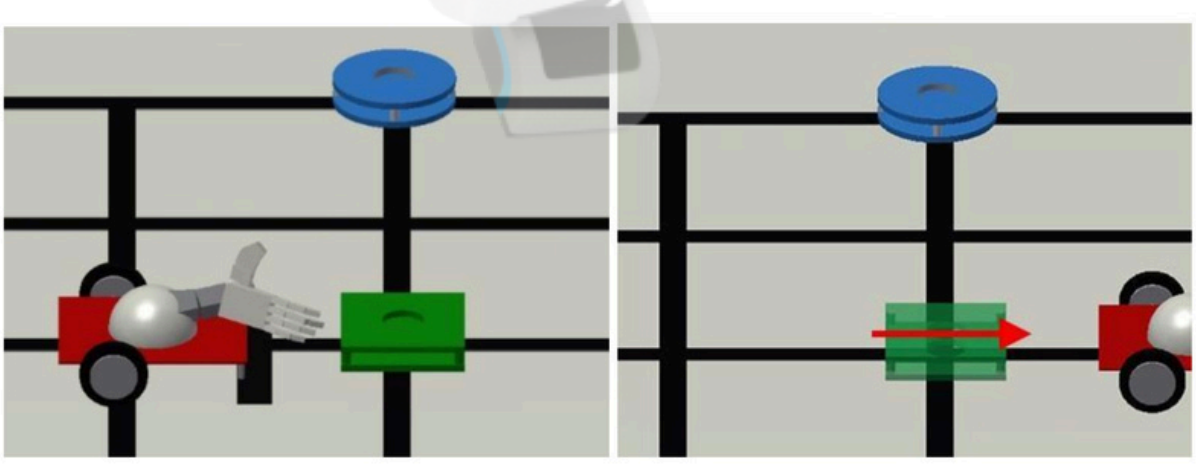
MATCH RULE

- Stop line

  At the end point, robot should stay on stop line for 3 counts of referee. Groups that succeed will have higher rank than groups that fail.
- Moving targets
  1. Participant can freely choose the number of targets to be transported at one time.
  2. It is allowed to push or lift targets again.
  3. It is not allowed to touch targets that fall from playfield.

- Crossing : Robot can cross point where target was placed.

EX Crossing example



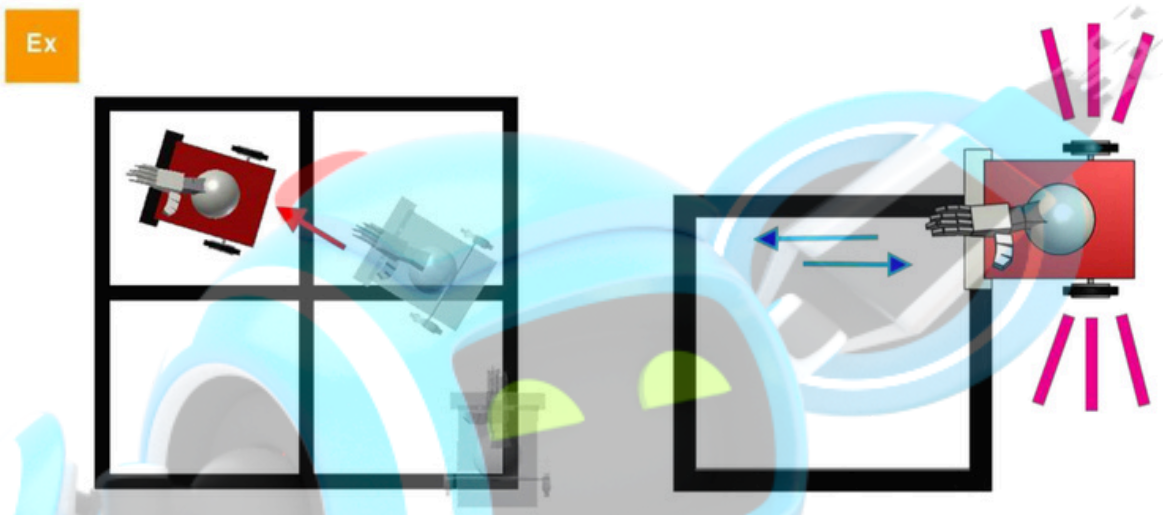
- Match stop

Out of line

If both wheel is out of line, then match stops and only record before match stops will be approved.

1. Out of line while turning direction
   Two wheels are out of line during changing direction to left.
2. After dropping target in goal and move backward, but out of line is also out of line.

Ex



Robot stop: If robot stops operating, then referee counts until 10 before removing the robot. Only points earned before robot stop is approved TKO(Technical Knock Out) : If robot stops, blocked completely by objects, or mingle around an area, then referee can give TKO without giving 10 counts for safety of robot and efficient match progress. Points are given to the robot for its progress before TKO.

Passing trap: If robot passes through traps then match stops and only progress before match stop will be counted.

Robot touch: During matches, participants and their robots are immediately disqualified and removed from match when participants touch robot without referee's authorization.

EVALUATION AND RANK DECISION

Evaluation

- Mission accomplishment and time record using time measuring instrument will be evaluated.
- Target success
  1. After match stop, referee will decide target success by observing targets on goal.
  2. When target is placed near goal, if target is not on cross point or moves out of goal during match, then the target placement is not successful.
  3. If target is moved by robot after dropping, then the target is not counted.
  4. If first floor target is not successful, then second floor target is not successful also.

- Time record
  1. Time record is measured by time measuring instrument between time that robot passes starting point and end point.
  2. If time measuring instrument cannot recognize robot, then participant can modify structure of robot to be recognized, and three restart chances are given.
  3. In case of black-out or time measuring instrument's malfunction, referee can decide to give battery change time and restart

- Final time record.