

\* Please be aware that this is provisional version of the rules, there may be some changes. Specially testing material of size and weight is still on progress, but still there will be new



## 1. Deskripsi pertandingan

Robot Gathering has to quickly reach the entire object given in the game. Carrying object mission priority is higher than completing driving. The robot's driving fast and accurate is important. Mechatronics related knowledge production and programming robots using the principle of dynamics, so the basics of robot learning to understand sufficient robots and sensor adjustment technology, as well as programming skills.

## 2. Robot

### 2-1. Robot type: No restriction

### 2-2. Construction (On site)

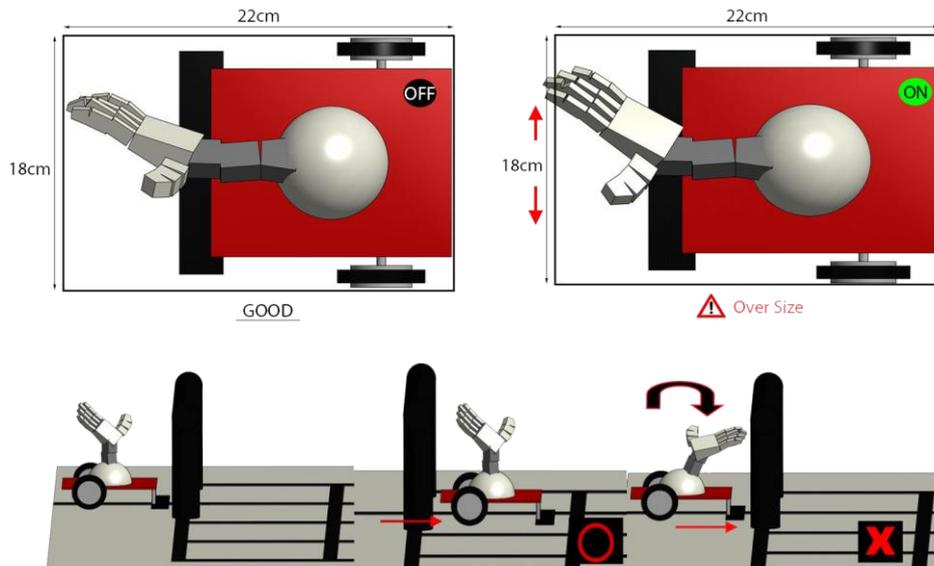
Participant has to construct all machinery parts of robot except the controller and while measuring the machine the assigned size has to be followed.

2-2-1. Built on-site The robot should be built on-site by the participant during the construction time except for the robot controller

2-2-2. Size: Robot should be less than 18cm X 22cm (H\*W)

2-2-2-1. Size measurement

- 1) Self-Check: Participant can check size of the robot in testing time of constructing zone.
- 2) Official inspection: Before the competition, referee will check the size of the robot.
- 3) Ways of Measuring: When the power of robot start to move will start to measure the equipment and participant cannot give any objection toward the judge.
- 4) Modify: If the size is over there is a minute to modify in front of the judge. If there didn't finish the job in given time it will be disqualified as overcharge size regulation.
- 5) Before checking on measuring the instrument and shape if the size is changes it will be disqualified.



2-2-2 Sensor of the Robot: No restriction

2-2-3. Power

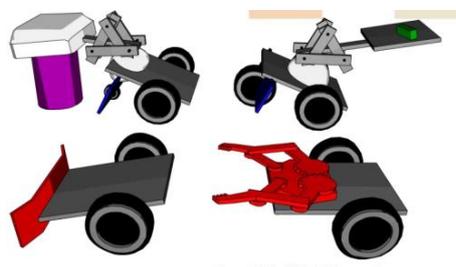
2-2-3-1. Robots should work with an independent electric power supply; it cannot se a combustibile device.

2-2-3-2. there is no limitation on type of battery or voltage.

2-2-4. Operation: No restriction

2-2-5. Structure in mission: Robot object can be move or having structure to load the object and cover with the basket.

**EX** Example of possible to use structural mission challenge



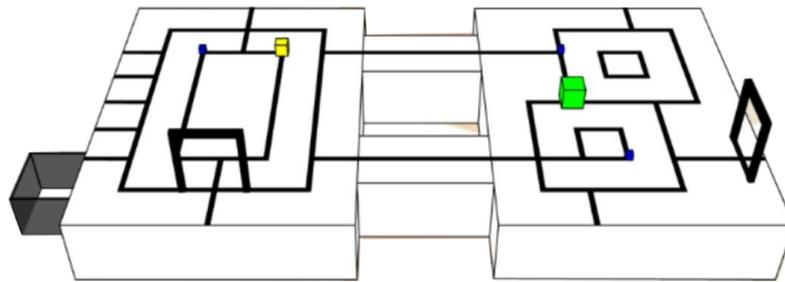
2-3. Robot must move autonomous by the program except the starting point and it cannot be operate by the outside.

### 3. Competition Site

3-1. Official Site: It must be an approval from International Robot Olympiad Committee

3-2 .Size and Composition: Size has to be 160cm X 120 cm ( $\pm 10\%$  and more than two blocks has to be connected.

**EX**



<Above the picture is example connection with bridge, arrangement, mission and line will be announce in the competition>

3-2-1. Connection

The size of competition has to be 25cm ( $\pm 10\%$ ) and bridge is connected with straight line and curve field is stick with tapes and paper sheets.

3-2-2. Site error prohibited range

The gradient of site has to less than 2 ( $\pm 10\%$ ) and there might be gap or bumpy which can be less than 3mm.

3-2-3 Prevention to stop falling robot

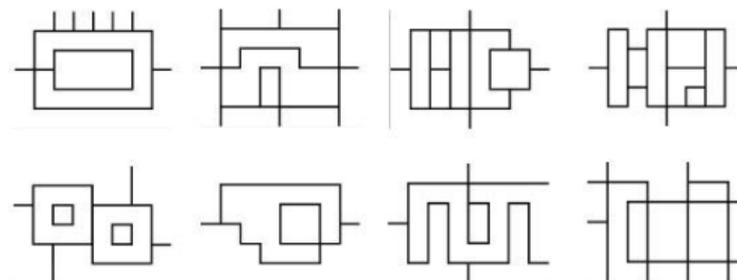
There will be no special structure for prevention to stop falling.

**3-3 Field**

It is cover with glossy coat sheet paper, advertisement, logo from the organizers.

3-3-1 Mission Map

It is constructing with intersection to Straight to Straight and Straight to curve and fix with sheets and tape in the field.



< Mission map is use as following example in Robot Gathering 2017>

3-3-2 Line

The color of line is black width of 2cm ( $\pm 10\%$ )

3-3-3 Installation of measuring instrument

In order to measure the time , starting and ending point measuring instrument will be installed, according to mission the direction can be changed, structure that is connected to

the field can be used.

### 3-4. Appendage of Competition Site

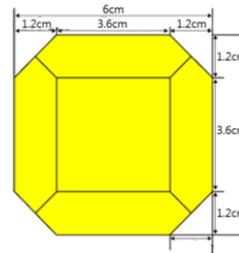
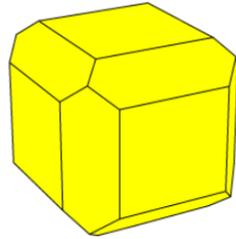
#### 3-4-1 Target area

The Weight is between 10~30g ( $\pm 10\%$ ) and can used as polyhedron with two different kind of size blocks

##### 3-4-1-2 Size of a Target

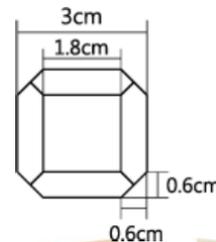
1) Large Cube: 6cm \* 6cm \* 6cm (W\*H\*H,  $\pm 10\%$ )

2) Small Cube: 3cm \* 3cm \* 3cm (W\*H\*H,  $\pm 10\%$ )



<Larges Cube>

EX



<Small Cube>

3-4-1-2 Target colour can be used freely.

##### 3-4-1-3 Allocating Targets

Location has to be intersection in mission map incuding starting point.

#### 3-4-2 Destination

According to the mission, the site of competition is assigned and allocated and divided in to inner and outer destination.

##### 3-4-2-1 Inner destination

There will be given an optional area in site of competition and designate the destination.

##### 3-4-2-2 Outer destination

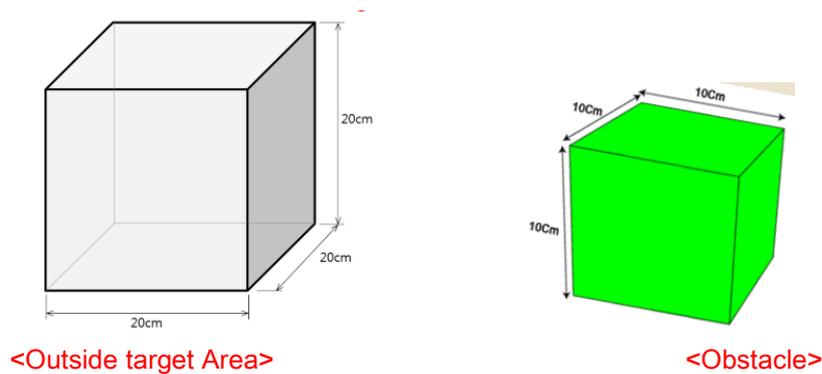
1) Size : 20Cm\*20Cm\*20Cm (Inform in competition day),

2) There will a special box in outside and desingate the destination

3) Installation : It will be in the ground and fixed next to side of the competition site.

### 3-4-3 Obstacle

In order to fix the structure it can give the physical limitation.



#### 3-4-3-1 Size

It will be size of a regular hexahedron 10Cm\*10Cm\*10Cm (W\*L\*H,  $\pm 10\%$ )

#### 3-4-3-2 Allocation

Following mission, the intersection points can be above the starting point and fixed in site of competition.

#### 3-4-4. Trap (Disable) can be shown unmovable spots

3-4-4-1 Spots can be shown as X in black in site of competition and mission map

#### 3-4-4-2 Allocation

According to the mission, it can assign in intersection and above the starting point.

## 4. Competition progress

### 4-1. Way of Game Method

Game will be result in two second of row and each time difference will be a rest time to check and repair once more.

### 4-2. Construction and practice time

Construction and practice time is less than 2 hours and it will post in competition day.

#### 4-2-1. Allocation of competition site

It will allocate based on number of participant and level of difficulty of the game.

#### 4-2-2 Production and Practice

Participants can do the practice until the end of posted production but before the game is prohibited.

### 4-3. 1<sup>st</sup> Run

After the construction and practice time the 1st run will begin.

**4-3-1. Preparation of the game**

All of the participant has to take the robot out and be ready from referee and volunteer's instruction.

**4-3-2 After the game standby**

When participant is finish with their game, they have to stay and watch all of the participant game until end of the competition day.

**4-4 Repair Time**

After the end of 1<sup>st</sup> run, the entire participant has 30minutes repair and practice time.

**4-5. 2<sup>nd</sup> Run**

After the repair time, 2<sup>nd</sup> Run will start to begin in the match.

**4-5-1. Preparation of the game**

All of the participant has to take the robot out and be ready from referee and volunteer's instruction.

**4-5-2 Stand by**

All of the participants finish with their game; they will go back to their seats.

**5. Competition****5-1. Performing the mission**

Course of run and order of carrying is not designated but participant can decided freely.

**5-2. Start**

They have to wait of sign from the referee and measuring instrument had started it will be the starting point. If they didn't start from the sign has to restart again.

**5-2-1 Miss Start**

If there was a miss start regarding the starting signs, time counted from 5 and the robot doesn't start it will be miss start and there will be one more chance to the team.

**5-2-2 Restart**

There will be second chance (including first start make 3 times), if the team miss following with the chances, it will be miss start and impossible to start the move.

**5-3. Arrival**

Line installed in measuring instrument of the robot or arriving at intersection of the point(Robot needs to install the line of measuring instrument or stop at intersection point) had to stop the

time measuring the instrument.

### 5-3-1 Mission

Robot arrives at the finishing point the referee counts until 3 second it will be admitted to reach the final stage of the game.

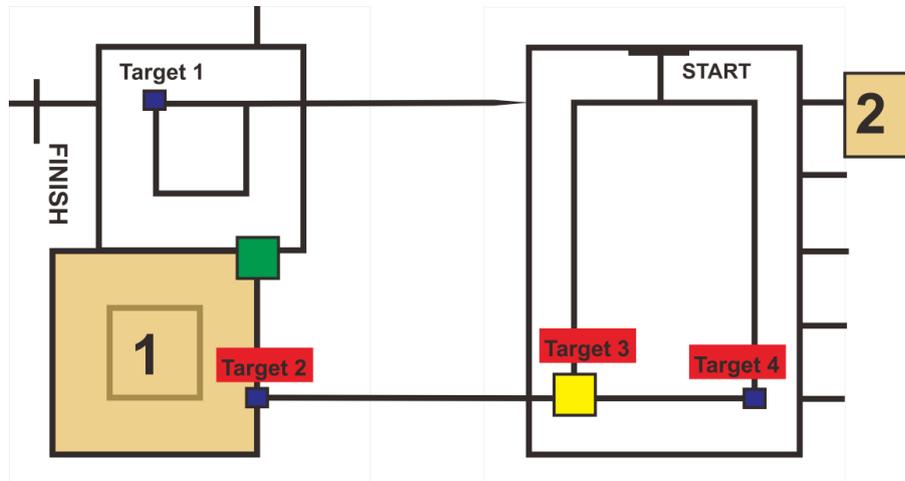
### 5-4 Limited Time

If teams do not complete the mission in two seconds, the match will be over and result will before the finishing point.

## 5-5 Opening the Mission

Before the game the team has to follow is line structure, location and number of destination and object also shape of bridge in site of competition will be shown as given mission to participant.

### Ex) Example of the Mission



#### 5-5-1. Moving the target

It can be move not by destination but the location.

#### 5-5-2 Numbers of moving target

It can be move only once in during the moving direction.

#### 5-5-3 Adjustment of target

The double touch is possible from the target which is move from the direction, and there are no limitations of numbers of target.

#### 5-5-4 Loss of target

Robot which had is collapse from outer site of competition cannot be reused.

#### 5-5-5 Crossing

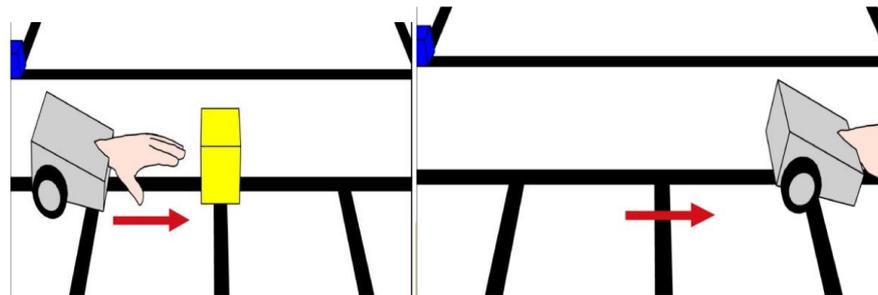
Robot can cross the target location

#### 5-5-6 touching the obstacle

There is limitation of physical part, but the point will not be deducted from the

participant.

**Ex)** Example of Crossing



**5-6 End of Competition**

If robot could not continue match, referee will announce the match is over.

5-6-1 Robot Stop

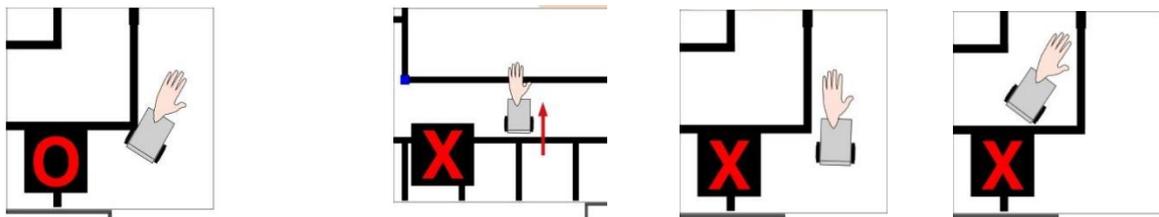
If the robot doesn't move the referee will count 10 seconds and if the robot still could not move call it a stop and count the points before reaching the end point.

5-6-2 TKO (technical knockout)

During the match, robot had been stopped over the structure and obstacle and could not start with the motion referee will decide the match cannot restart the reason of repeat motion of robot and it will be announce TKO and result will be admitted before the TKO.

5-6-3 leaving the line

If the robot is not on the line the match will be stop and before coming to this area resulted will be admitted.



<Decision of Line admittance>

< Decision in Leaving the line>

**5-7 Due to disqualification of ending the match**

During the match, when participant violate the rule or making interruption the match will be ended but result will be not admitted.

5-7-1 Robot Touch

During the match, participants touch the robot without judge and supervisor authorization it will be robot touch and disqualified.

5-7-2 Repair time during the match

During the match, additional, remove, exchange, changing the toll is prohibited but during the standby to repair the robot the participants has additional battery then the team will be disqualified.

#### 5-7-3 Sensor turning

Before the competition, there was a sensor turning situation happen then it will be disqualified.

### **5-8 Rematches**

During the match when it had been black out and breakdown of measuring instrument happens referee and coach can make a decision to do rematch.

## **6. Scoring the Result**

### **6-1. Ranking decision article**

Mission points and time record of the target, stop mission of finishing line.

### **6-2. Mission point**

When the game finished, finally in the destination they will look over the object and decided the success of result. Some of target will be close to area and it's hard to look then it will be failure. The entire decision is upon the referee.

### **6-3. Time record**

Time record is based on the measuring instruments.

### **6-4. Final score**

Better score out of 1st and 2nd run will be the final score.

### **6-5 Order of priority to result**

Groups will be divided according to the group and their record will be compare and result has to be decided, the arrival point if they succeed the stop mission the result will be on the top.

Number of success object > Time record > Success of stop mission > Compare to time result

#### 6-5-1 Order of priority according to present

If is same result in the present time then the referee needs to look the other time of the record and decided the result.

#### 6-5-2 Order of priority according to Tie-Breaker

In order to sum up the best result from first and second chance, if it's a tie it will be 1st to be in best rank.

※ Common

**1. Seat and electricity use**

**1-1. Seat**

WIRC chooses participant's seat and it's not negotiable. Failure to obey may lead to cheating will give a penalty to the team.

**1-2 Electricity use**

Two participants are seated in one table. One power socket is given per each participant. Participants are allowed to bring and use multi-tab

**2. Computer use**

Participant who needs the computer to use in competition, they need to bring it but notebook which had battery inside is prohibited. Mostly in competition sites the electricity is not that stabled so computer which does not assist the battery could happen in serious accident toward the participant.

**3. Match place environment**

**3-1. Light interference**

Participant should be prepared to control robots under electrical lightings, sun- lights, and photographing.

**3-2. Signal interference**

Participant should be prepared to control robots under electrical signal interference by electrical material, communication device.

**4. Carry restriction and prohibition**

**4-1. Carry restriction**

Participant can carry storage devices including MP3 player, PMP but make sure that it is switched off before entering the playfield. If this misbehavior is found, he is disqualified.

**4-2. Carry prohibition**

Participant cannot carry storage devices including USB memory, and any material related with robot and manual. Also it is not allowed during competition. If this misbehavior is found, he is disqualified.

**5. RFID card: Must wear around neck to participate.**

**6. Uniform: Participants has to wear the official inform to participant in the tournamen**

**7. Material prohibit**

**7-1. During the match**

No material is allowed during competition. Material must be delivered to students before

competition begins. If this misbehavior is found, he will be asked to leave.

#### 7-2. Lunch time

If lunch time is included during the match, you are not allowed to carry any materials out of playfield. Also you are not allowed to bring any materials in the playfield after lunch time.

### **8. Cheating**

If cheating is found, warning is given at the first time, and disqualification is given at the second time.

#### 8-1 Leave

8-1-1. Communication with spectators or other participant

8-1-2. Use of part of robot that is not authorized before match

#### 8-2. Warning (gain two warning lead to leave)

8-2-1. Touching or damaging other participant's robot, laptops, or belongings

8-2-2. Not obeying referee or marshal. Disrupting order

### **9. Site arrangement**

Referee and supervisor can assign practice playfield and restrict practice time per participant / team to manage equal and fair practice time.

### **10. Match result confirmation**

Participant should be prepared to control robots under electrical lightings, sun-lights, and photographing

### **11. Duplication of participate**

It is possible to participant in each event but it is assigned in same day, it is upon to the participant. But there will be no extra time.

### **12. Others**

Committee will decide other unspecified rules and notify on match day. It is not allowed to object.