

# ENJOY AI (Robotics Competition Game 2019) - Olympia Fire Competition Rules

## 1 The competition theme

Prometheus was a Titan god in ancient Greek myths and legends. He created human, at the same time imitated the god of voice, which finally helped human to make voice, and taught the human knowledge and technical methods. At the same time, he challenged Zeus, Lord of Olympia, and his hegemony to mankind. In order to remove the human's plight without spark, Prometheus didn't hesitate to violate heavenly rules and bravely steal skyfire, so as to bring the light and wisdom to human. Prometheus fought against Zeus indomitably.

The ceremony of lighting the Olympic flame in the ancient Olympic Games, originated from the myth. According to the religious ceremony, a fire is lit at the altar in front of Zeus, Lord of Olympia, then run the city-states holding the torch to deliver the message that the Olympics are coming. Each city-state must stop war, forget hatred and war, and be ready to take an active part in the Olympic Games, so the torch symbolizes peace, light, unity and friendship, etc.

According to Olympic tradition, the torch is supposed to arrive in the host city the day before the opening ceremony and ignite on the day of the opening ceremony. The host countries usually arrange the representative and featured characters, such as Olympic gold medalists who bring glory to their country in the last part of the journey, to run around the stadium in front of a rapturous audience with the torch then up to the pyre to light the flame.

The sacred task now lies with the competitors, who seem torch bearers. They will go to Mount Olympus to find the flame and light torch.

## 2 competition field and environment

### 2.1 field

The size of the competition field is 220X120cm (figure 1). The material is PU cloth or spray - painted cloth. The width of the black guide line is 2.5cm. Obstacles may be placed in the place of thin lines. There are six mission areas marked by thin red lines in the field.

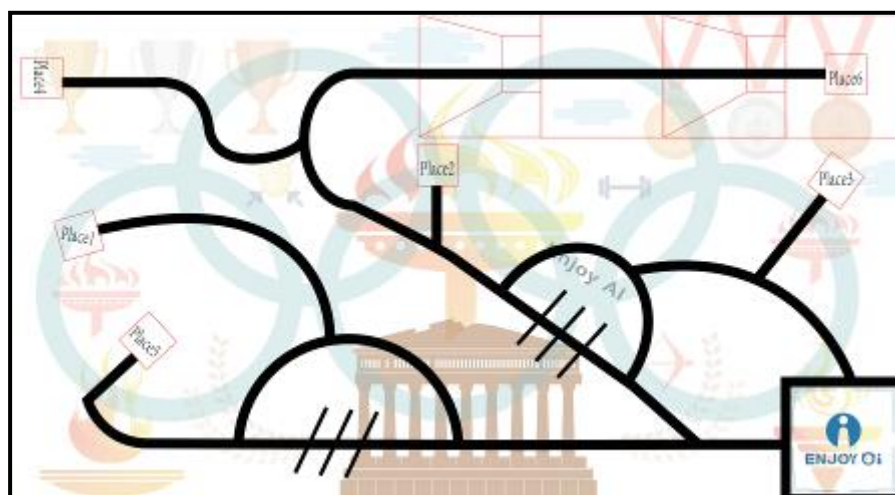


Figure 1 The schematic plot competition field

The trapezoidal part formed by the red line is the slope. The top of the first slope is 5cm away from the ground, and the second slope is 13cm away from the ground. There is a 30\*30cm base at the lower right of the field. The robot starts from the base and completes the corresponding tasks in the corresponding task area.

### 2.2 competition environment

The robot competition environment is cold light source, low illumination, no magnetic field interference. However, due to many unpredicted factors in the general competition environment, for example, the surface of the field may have stria or be uneven; there may be cracks on the border; the lighting conditions may be changed. Teams should design robots which can respond correspondingly to unpredicted conditions.

### 3 Robot tasks and scoring

The following tasks are simulations of life situations. Don't compare them with real life.

#### 3.1 Looking for the solar halo

3.1.1 A treasure box model with the solar halo is placed on a task area of the field, as shown in figure 2.

3.1.2 After the robot finds the treasure box, it needs to take out the solar halo from the treasure box without touching the area between the sun halo model and the mission area, 60 points, as shown in figure 3.

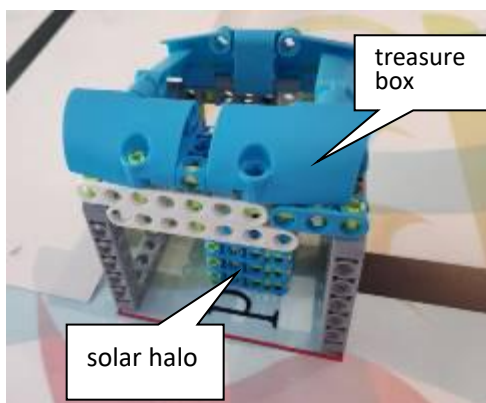


Figure 2 The treasure box model

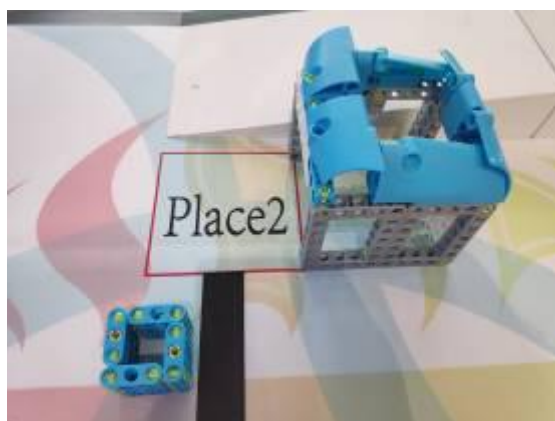


Figure 3 Completed status chart

#### 3.2 Collecting the flame

3.2.1 A model of solar halo frame is fixed on a task area of the field, as shown in figure 4.

3.2.2 The robot needs to place the solar halo on top of the solar halo frame and keep it here until the end of the game, 80 points, as shown in figure 5.



Figure 4 The solar halo frame model

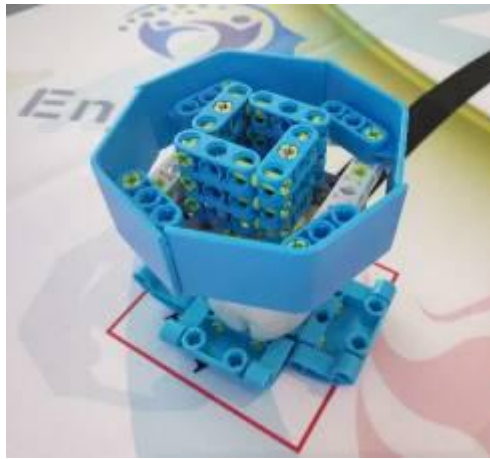


Figure 5 Completed state

### 3.3 Get the fire

3.3.1 A model of a fire pot is fixed on a task area of the field, as shown in figure 6.

3.3.2 The robot should first push away the lid of the fire pot and take out the fire without touching the task area, 60 points, as shown in figure 7.

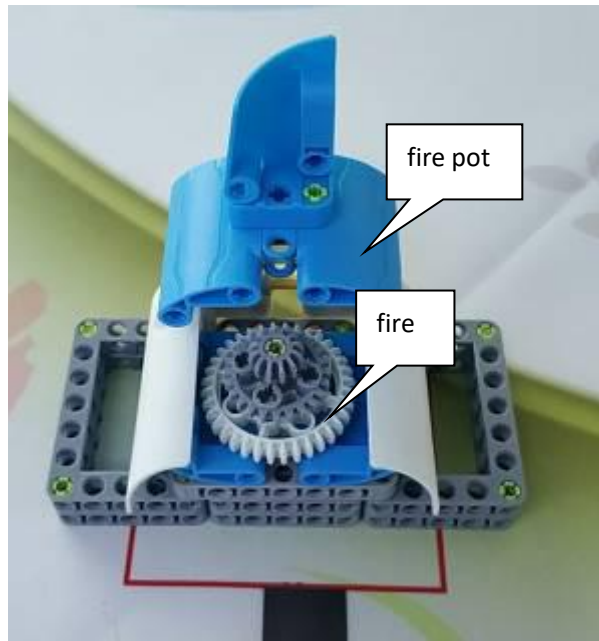


Figure 6 The model of fire pot

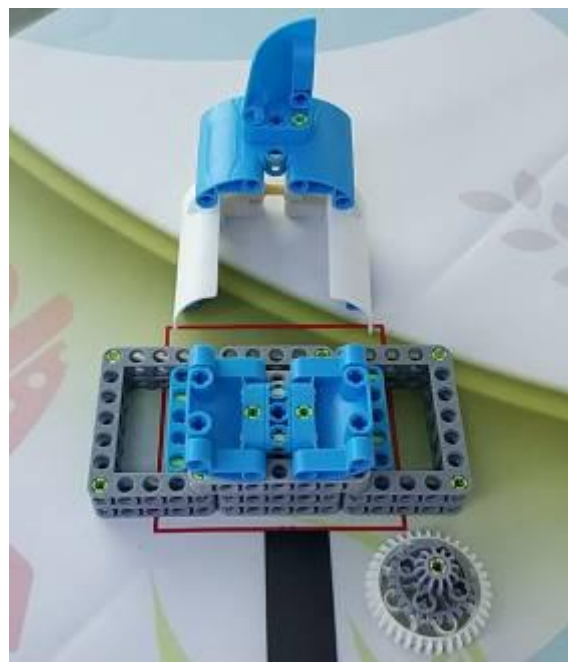


Figure 7 Completed status chart

### 3.4 light the torch

3.4.1 A model of the Olympic cauldron is fixed on the top of the slope, as shown in figure 8.

3.4.2 The robot needs to place the flame on top of the platform to light the torch, and keep it there until the end of the game, 100 points, as shown in figure 9.

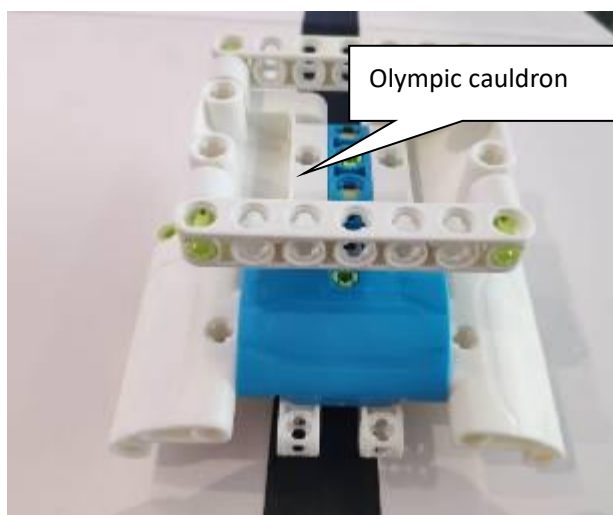


Figure 8 The Olympic cauldron model

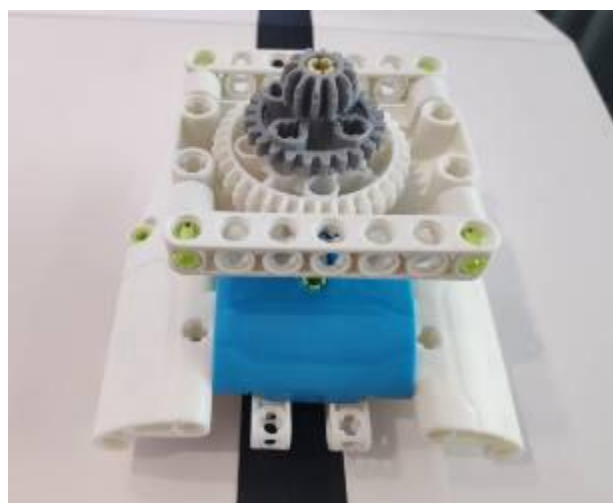


Figure 9 Completed status chart

### 3.5 deliver peace

3.5.1 An olive tree model is fixed on a task area of the field, as shown in FIG. 10.

3.5.2 The robot needs to pick the olive branch from the olive tree without touching the olive tree, 80

points, as shown in figure 11.

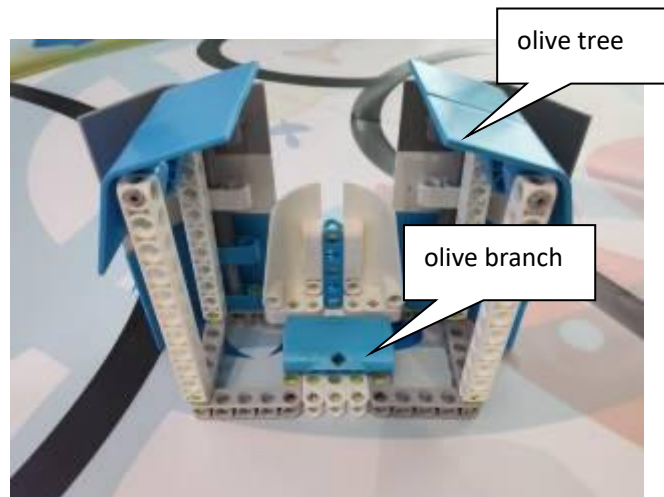


Figure 10 The olive tree model

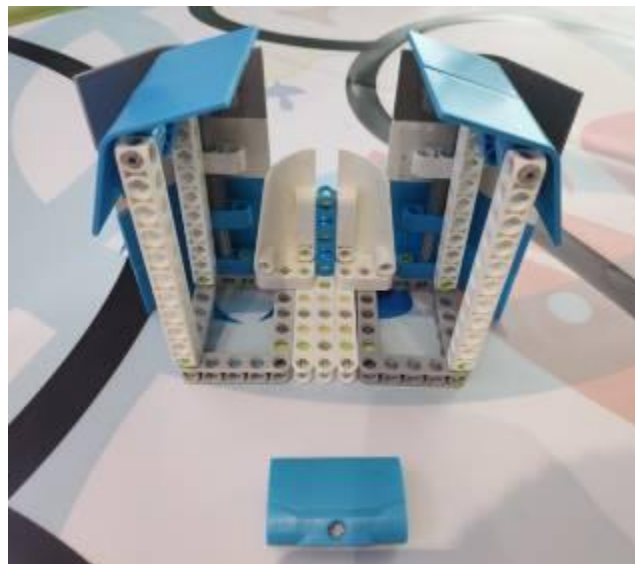


Figure 11 Completed status chart

### 3.6 Complete delivering

3.6.1 The robot will return to the base and no longer move. The partial orthographic projection of the robot is in the base, 40 points.

3.6.2 Completion of delivering must be the last game task completed.

### 3.7 Model location description

The position of the Olympic cauldron model is fixed, the position of other known and mysterious task models is announced before the competition, and the placement of all task models is in accordance with the principle that is conducive to complete the competition for robots.

## 4 Robots

4.1 Robot size: Before leaving the base, the robot size shall not be larger than 30\*30\*30cm (length \* width \* height); After leaving the base, the robot's body can stretch itself.

4.2 Controller: It is not allowed to change the controller in a single round. Each robot is allowed to use only one controller.

4.3 Actuator: Each robot is allowed to use no more than 4 motors in total (steering gear is not allowed).

4.4 Sensors: Each robot is allowed to use any kinds or number of sensors.

4.5 Structure: The robot must use the plastic split-type structure without tie, screw, rivet, glue, tape and other auxiliary connection materials.

4.6 Power supply: Each robot must have its own independent battery box. It is not allowed to connect to external power supply. The battery voltage shall not be higher than 9V, it is not allowed to use boost, buck, stabilized voltage and other circuits.

## 5 Competition

### 5.1 Teams

5.1.1 Each team should consist of one to three students and one coach.

5.1.2 The players should face and deal with all the problems in the competition with a positive attitude, who respect themselves, treat friendly and respect their teammates, opponents, volunteers, judges and all those who work hard for the competition, and try to cultivate themselves into people with sound personality and healthy psychology.

### 5.2 Competition Rules



5.2.1 The competition is divided into three groups: primary school, junior high school and senior high school.

5.2.2 There is no preliminary or rematch. The organizing committee guarantees that each team will have the same number of appearances, no less than 3. Points are scored for each appearance.

5.2.3 On the competition field, there are tasks stipulated for the robot to complete (choose tasks from 3.1 to 3.6, there may be some temporary tasks). The number of tasks for the three groups may be different.

5.2.4 After all game sessions are complete, the sum of points of each session is regarded as the team's total points, and the team is ranked according to its total points.

5.2.5 The competition committee may change the competition rules according to the actual situation of the entry application and the venue.

### **5.3 Competition process**

5.3.1 Building robots and programming

5.3.1.1 Programming and debugging can only be done in the debugging area.

5.3.1.2 The student members of the team can enter the preparation area only after registration. The judges examine equipment carried by the teams, except for the controller and motor can maintain the factory mode, all equipment must be spare parts, and must not be constituted by welding, riveting, bonding and other ways. Members are not allowed to carry USB disk, CD, wireless router, mobile phone, camera and other storage and communication equipment. After all students have taken their seats in the preparation area, the judges will issue the team a map of the field and instructions for the competition.

5.3.1.3 Competitors are not allowed to use the Internet, download any materials from the Internet, shoot the competition field with camera, or contact coaches or parents in any means in the debugging area.

5.3.1.4 The students have 2.5 hours to set up, debug and program in the preparation area. After that, each team will line up the robots in the designated position in the preparation area and can not modify

the program or hardware before playing.

5.3.1.5 After each round, teams are allowed to simply repair the robot and modify the control program in the preparation area. Except for the first round, there is 0.5 hour for debugging before each round, but appearing sequence shall not be interrupted.

### 5.3.2 Preparation before competition

5.3.2.1 When it is ready to play, the team members take their own robots and enter the competition area under the guidance of the instructor. Teams that fail to show up within the specified time will be deemed to have abstained.

5.3.2.2 Student players present stand near the standby area.

5.3.2.3 The team put their robots in the standby area. Any part of the robot and its projection on the ground must not exceed the base.

5.3.2.4 The team members present should hurry up (no more than 1 minute) to make the preparation before starting. During the preparation, the robot shall not be started and the program and hardware equipment shall not be modified. After the preparatory work, the players should signal to the judges.

### 5.3.3 start

5.3.3.1 When the judge confirms that the teams are ready, a "3,2,1, start" countdown will be issued. As the countdown begins, a team member can slowly approach the robot with one hand. On hearing the first word of the "start" command, the team member can touch a button or give a signal to the sensor to start the robot.

5.3.3.2 Starting a robot before the "start" command, is considered "false start" and the team is subject to a warning or penalty.

5.3.3.3 Once a robot is started, it can only be controlled by a program in its own controller. Team members are generally not allowed to touch robots (except in retries).

5.3.3.4 The activated robot shall not intentionally separate components or drop mechanical parts on the field. Robot parts that fall off accidentally will be cleared out of the field by the judge at any time. It is foul to separate components for scoring purpose and the task points is invalid.

5.3.3.5 If the activated robot throws the carried object out of the field due to excessive speed or program error, the object shall not return to the field.

#### 5.3.4 Retry

5.3.4.1 If the robot malfunctions during operation or fails to complete a task, the team members can apply the judge for a retry.

5.3.4.2 The state of the field remains the same after the judge agrees for a retry. If a task is retried because the task was not completed, the state of the item used for that task remains the same. The team can move the robot back to base and restart it when the team retry.

5.3.4.3 There is no limit on the number of retries per game.

5.3.4.4 Timekeeping does not stop or restart during retry. The tasks completed by the robot before retry are valid.

#### 5.3.5 Competition completed

5.3.5.1 Each competition lasts for 150 seconds.

5.3.5.2 After the team has completed some tasks, they should signal to the judge if they not ready to continue the competition. The judge stops the clock accordingly, and the competition is completed. Otherwise, wait for the judge' s final whistle.

5.3.5.3 After the judge blows final whistle, the team members shall immediately switch off the power of the robot and shall not touch the robot or any objects on the field.

5.3.5.4 The judge is obliged to inform the players of the result of the scoring. Team members shall have the right to correct any errors which may occur in the marking operation and shall sign to confirm that

they already know their points. Any dispute shall be submitted to the chief judge for arbitration. The judge fills in the scoring form and the team members shall confirm their points.

5.3.5.5 The team members restored the field to the pre-start state and immediately moved their robots back to the debugging area.

## **6 Record the points**

6.1 At the end of each competition, the point is calculated according to the completion of the task. See section 3 for the scoring criteria for completing a task.

6.2 The order in which tasks are completed does not affect the point of single task.

6.4.3 If there is no retry in the competition, the robot moves smoothly and complete the task at one go, then the team will score 40 points. Reward 30 points for one retry; Reward 20 points for 2 retries; Reward 10 points for 3 retries; Reward 0 points for 4 and above retries.

## **7 Foul and disqualification**

7.1 Teams that fail to show up on time will be penalized 10 points for each minute. If they do not show up after 2 minutes, the team will be disqualified.

7.2 The first false start will be warned by the judge, and the robot need to get back to the standby area to be started again, restart the timing clock. A second false start will result in disqualification.

7.3 It is foul to separate components for the purpose of strategy. Depending on the seriousness of the case, the team may be disqualified.

7.4 The judge will warn the team if the robot crashes into the facility at high speed. If the robot damages the facility for the second time, it will be disqualified.

7.5 Team members who intentionally contact objects or robots on the field during the competition will be disqualified. Casual contact may not be considered as foul unless it directly affects the final point of the competition.

7.6 Failure to follow the judge's instructions, the team will result in disqualification.

7.7 Team members who contact coaches or parents without the permission of the judge will be disqualified.

## 8 Prize

8.1 Each group is ranked according to its total points.

If a partial tie occurs, the following rules will be used to determine the order:

- (1) The team with the shortest total time of competition ranks higher;
- (2) The team with the most times of completing single task in all competition ranks higher;
- (3) The team with the highest lowest point ranks higher;
- (4) The team with the highest second-lowest point ranks higher.

8.2 According to the points of the team, determine the award grade (zero points, abstention teams don't count in the ranking), and set the champion, runner-up, third runner-up, first prize, second prize, third prize, respectively.

### Attachment:

ENJOY AI Popular competition - Olympia Fire					The_round	
No.		Team name		Group		

Task	Description	point	point
Look for the solar halo	Remove the solar halo from the treasure chest	60	
Collect the flame	Place the solar halo on top of the solar halo frame	80	

Get the fire	Get the fire from the fire pot	60	
Light the torch	Place the fire on top of Light the torch	100	
Deliver peace	Pluck the olive branch from the olive tree	80	
Complete delivering	The partial orthographic projection of the robot is in the base	40	
Mysterious task	Please refer to the notice.	100	
Smoothness reward	$40 - (\text{number of retries}) * 10, \text{ and } \geq 0.$		
total points			
Used time of single round			

Score to confirm			
I confirm that the above score record is true and valid without any objection.			
team:		judge:	
Questions and notes			
Chief judge:		Input :	