



Istanbul Technical University Robot Olympics 2019 Drone Category Rules

Definition of the Task

- In this category, participant robots try to fly in a determined direction around 2 poles on the racing area.

Success Criteria

- In this category, main criterion is turn around 2 poles least two times.

Robot Specifications

1. Only rotary-wing(helicopter and multicopter) autonomous aircrafts can participate to the race.
2. Robots can be maximum 2.5 kilos.
3. Robot's width, length and high can be maximum 1 x 1 x 1 meter. Robot's dimensions can be changed after start of the race if they don't pass over the dimension limits.
4. Participants can use external comuter which connected to robot wireless if they want. But this computer must be brought to the race by participant and this computer must stay on to referee's table. Participant can use to this computer for only landing and rising manually. All of other system such as location designation must be autonom.
5. If participants want to use external computer, they have to use wireless controller that connect to robot. This controller must have an ability to change the robot's mode (autonom to manuel or manuel to autonom) and robots must be controlled manually if it requires.

Race Area Specification

6. Race area's lenght is minimum 8 meter and width is minimum 4 meter. Poles are minimum 3 meter.
7. Dashed elips figure was drawn around to 2 poles on to the race area. Line's width is 8 cm lenght is 25cm. There is 8 cm space between two line.
8. Security net surround to the race area.
9. Top view of the race area:

Competition

10. All robots race order

11. Participants have got 10 minutes set up time for operations such as calibration and set up
12. Participants have to put their robots on to the determined point on the race area which is showed by referee
13. Racing time is 10 minutes. Participants can end their race in shorter time if they want.
14. Robots can take off autonomously or manually. Robots have 2 minutes to take off. The 10 minutes of racing time starts after the departure.
15. The contestant will have the right to investigate the robot 5 times after the 10-minute competition period starts. Interviews will not stop the competition period. The contestant's right to contest will be over in 10 minutes.
16. Robots have to fly autonomously even they take off manually.
17. After the departure, robots should fly autonomously inside of the borders and they shouldn't pass between columns.
18. Dashed lines and ellipse has been drawn for be reference to robots. Robots are not have to follow the lines accurately.
19. Robots must fly at least 1 meters and at most 3 meters above the ground.
20. Robots can land manually if their time to race is finished.

Scoring

21. $\text{Score} = (\text{number of rounds}) * 100 - (\text{number of mistakes}) * 50.$
22. 100 points will be given to each robot for each round they complete. In case of equality, the intervention rights used for robots will be compared. The robot, which uses less right, will be more successful in the ranking. If the intervention rights used are equal, the distance the robot travels at the end of the 10min race time will be scored over 100 points, with a full round of 100 points.
23. Passing between columns calls as a mistake and the robot which does this mistake be punished with 50 points. The tour that robot can't complete successfull counts invalid. That means robot can't have points from that tour and when it backs to above of the line it starts a new tour.
24. During the competition, the autonomous flight of the robot will not stop for any reason due to manual intervention by the competitor. If the contestant wants to continue competing after the intervention, he / she will be able to put his robot back to the starting point and continue. Scoring shall be made according to Article 22 at the end of the contest.
25. At the end of the competition, the scoring of the robot will be done according to the 21st, 22nd, 23rd and 24th items. The higher the ranking the robot will be at the top of the rankings.

Security:

26. Robots' propellers are not allowed to be installed anywhere outside the area surrounded by safety net. Before the competition, the propellers must be installed and the propellers removed from the robot before leaving the safe area after the competition.

27. In case the robot has a valid propeller protection, the competitor may be exempt from Article 26. The contestants who wish to be exempted from the 25th Article specify this on the robot registration table and the robot is examined by the referees. If approved by the referees, the competitor shall be exempted from this rule.

28. The competition will be held in the closed area of Istanbul Technical University Süleyman Demirel Culture Center.