



# Innopolis Open

Innopolis University Olympiad  
in Robotics

**INN**opolis  
UNIVERSITY

Profile

**INTELLIGENT AUTONOMOUS UNDERWATER VEHICLES**

Age group

**13-18 years**

## **HOW TO QUALIFY FOR THE CHALLENGE**

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## 1. Applying for qualification

- 1.1. A team must apply for qualification through a special form on the corresponding challenge page of the official Innopolis Open website.
- 1.2. Application deadline: 13<sup>th</sup> May 2019.
- 1.3. Applications submitted with violations are not accepted.
- 1.4. When multiple applications are submitted by one team, only the application submitted last is accepted for consideration.

## 2. Requirements for competition materials

### 2.1. Competition materials include:

- 1) demo video
- 2) specification

### 2.2. Requirements for the demo video:

- 1) The video must be shot above water.
- 2) The video must show a participant immerse the machine in the water and run it for the performance of the task.
  - a. After the immersion, it must be shown that none of the parts of the robot are left above water (the machine is completely beneath the water).
  - b. The video shows the robot pass through a shield with a hole in it. The shield must be placed no closer than 2 meters to the start. The size of the hole should not exceed the size given in the regulations. The gate can be made of any material. This task is worth 25 points.
  - c. The video shows the robot swim along the line (the requirements for the line are the same as in the regulations). The distance between the shield and the line must be more than 1 meter. The line must be rotated 45 degrees clockwise or counterclockwise to the axis of the gate. This task is worth 25 points.
  - d. The video shows the robot touch or place any part of its body on the flag lying at the bottom. The distance between the flag and the end of the line must be more than 1 meter. The center of the flag matches the center of the longitudinal axis of the line. This task is worth 25 points.
  - e. Come to the surface inside a hoop (as in the regulations or less). The center of the hoop matches the center of the flag. The task is worth 25 points.
  - f. The video shows clearly that after running the program and before coming to the surface no one interacts with the robot anyhow.
- 3) The video shows the team perform no less than 3 attempts in a row.
- 4) The best attempt of a team must be worth no less than 75 points.
- 5) The video should not be longer than 15 minutes. The video must be filmed in one shot.
- 6) The depth of the pool must be no more than 1.5 meters. The length and width of the pool are irrelevant. It is important to sustain the distance between the models.
- 7) The definition of the video must be no less than 1280x720 (HD).

### 2.3. Requirements for the specification

- 1) The specification must consist of one page and be saved as PDF. Its size must be no more than 5 Mb.
- 2) The specification must include a high-quality photo of the team and the robot. It can be a joint photo of the team and the robot.
- 3) The following information about the robot must be included:
  - a. Overall dimensions of the robot
  - b. Characteristics of the propulsion device (weight, traction, dimensions, manufacturer)

- c. Characteristics of the battery (output voltage, capacity)
  - d. Characteristics of the camera if there is one (viewing angle, image sensor, photosensitivity)
  - e. Characteristics of the on-board electronics (microcontroller, computer, main interfaces)
  - f. Main mechanical materials (plastic, aluminum etc.)
- 4) The following information about the team must be included:
- a. Name of the team
  - b. Name of the institution, city, region
  - c. List of team members (including the coach)
  - d. Roles and functions of each member of the team