**Amazing Robots –competition for teams of universities and universities of applied sciences**

In the competition, the objective is showcase modern technologies and creativity. The purpose of the competition is to expand the visibility and interestingness of information technology, robotics and artificial intelligence in Finland and encourage students to combine the knowledge of separate fields without prejudice. A message is also given to the industry: new technologies have to be without prejudice brought into use both in the products and in production.

These rules have been translated from the Finnish ones (to large extent using machine translation). If the meaning of the rule is not clear or is in contradiction to the Finnish rules, the Finnish rules are the ones to be followed.

**General description**

The task is to make a robot which makes something interesting. What does it do, the team must invent. The purpose is to let creativity and technical skills bloom. Little restrictions and a lot of freedom is given.

The competition is for the students of universities and universities of applied sciences. The members of the competition group have to be students of the educational institution during the day of the competition. The maximum size of the group is eight students.

From the same educational institution, several teams may participate in the competition.

The competition takes place in connection with the Teknologia 19 trade fair in Messukeskus, 5.-7.11.2019, www.teknologia.messukeskus.com .

The competition is organised by Association of Information technology and Electronics (Tietotekniikkan ja Elektroniikan seura, TiES) in cooperation with Mikrobitti magazine and Messukeskus. This competition is in the first of its series. The next competition is arranged in connection with Teknologia 21 trade fair.

**Robot**

1. The weight of the competing device may not exceed 5 kg. The device can be one robot or a swarm of several robots. If the task of the robot requires placing objects in the competition area, these are included in the maximum weight. In the following, the term `robot´ refers to all the active parts in the competition irrespective of how many separate active parts there are.

2. The robot must be independent. It must not be controlled from outside. The only exception is a compulsory cordless controller with which the competition execution is started and which can be used to stop the robot. With the controller, other controls must not be made. The weight of the controller is not included in the maximum weight of 5 kg.

3. The robot must operate with the energy stored into it. The robot must be emission-free during the competition.

4. The robot can be connected to the local network. It may open network connections and may search for information from there. The connection must not be used to control the moves of the robot. The necessary information to create the connection can be loaded in the device before the beginning of the competition. The functionality of the connection is on the competitors' responsibility.

5. If a robot consists of many active parts, these can communicate among themselves on legal radio frequencies and on radio protocols, voices, light and gestures. The voices and lights must not cause a danger to the public (strong voices, efficient lasers, strong flash lights etc).

6. The robot has to have at least one moving part. The body itself is not required to move.

7. One slide or a video lasting about one minute describing the robot is required. This material will be used in the awards ceremonies and other communications relating to the contest. The competitors can use this same material for describing their robot (look at `Competition Area and Situation, Article 3`) during the competition.

**Competition Area and Situation**

It must be possible to follow the robot´s performance in the competition arena. The performance is videoed and shown on the screens to the audience.

1. The competition arena is a cube having the sides of 2 meters. The floor is even and matte black. The limits have been marked with a 5 cm wide white painting or tape. The outer edges of the white lines mark the limits of the arena. The walls and the roof have not been marked. No part of the robot may exceed the limits.

2. The robot is placed anywhere on the competition arena by the competing team.

3. Next the team briefly describes the robot and the task it is going perform.

4. After the judge's permission, the robot is started. It has the maximum of four minutes to present its program. The robot has to stop by itself when the program ends.

5. The ability to halt the device by the controller shall be used only if the robot is damaged or it is in a dangerous situation. The use of the emergency stop leads to rejection from the contest. The functionality of the emergency stopping feature has to be proven to the organizers before the competition by starting the robot and stopping it at a random part of its performance.

6. Placing of the robot, description of the performance the robot is going to do, the performance itself and the removal of the robot from stage altogether can take at most ten minutes. The objective time is shorter than this, eight minutes.

The steps described above are of such nature that failing to implement any one of them results in rejecting the performance.

**Assessment**

The following criteria are used in the evaluation of the robot’s performance. The relative importance of these criteria is not given. It is up to the judges to make their own assessments. Criteria #1, Movement or gestures, is the only compulsory function of the robot. The other functionalities are taken into account in the rating only if they are a natural part of the performance.

1. Moving of the robot or its gestures.

2. Visual appearance of the robot.

3. Voice world of the robot.

4. Technical challenges and the actual implementation of the robot.

5. Cooperation between the active functionalities of the robot.

6. How the robot reacts to its environment (Does it understand or react to gestures, speech, music, to the public etc.).

In addition, the evaluation takes into account the basic idea of the robot and how well the robot reflects that idea. This is related to the short introductory presentation of the robot that was given at the beginning of the performance.

**Jury**

The jury includes the experts of different fields. In addition to technical and business experts the jury will also contain expertise from the arts sector.

**Prizes**

The first prize is 10000 €, second 5000 €, and third 2000 €. Other prizes will be announced later. The jury has the right to adjust the criteria and the prizes if there are special justifiable reasons.

**Time of the Competition**

Free practicing for the Finals and the possible screening of the finalists will be organised on Tuesday 5.11 and the Finals are held on Wednesday 6.11, both in Messukeskus. There is the possibility to partially cover travel expenses for competitors coming from outside the Metropolitan area.

Our aim is to provide space for showing the robots in action and at the same time give positive visibility to the participating schools during the exhibition in Messukeskus 5.-7.19 in the TiES space.

**Registration to the competition**

It is strongly recommended to register for the competition immediately after the team has been formed. This way the group gets real-time information about the competition. After registration the team members will start receiving the Mikrobitti magazine free of charge for 2019. This magazine covers the competition among other interesting topics in Finnish.

The team members will also be registered as student members of TiES, www.TiES.fi . This entitles participation in TiES activities like industry visits and seminars. In February Ties will visit Canatu, a nanocarbon hi tech company catering the car industry. In March TiES will visit Nokia Executive Experience Center.

Registration to the competition is completed by providing the information requested below to Mauri Inha at mauri.inha@ties.fi

1. The name of the team (self invented).

2. University whose students all the members of the team are.

3. The name and e-mail address of the contact person of the team.

4. The name and postal address of every member of the team.