RoboCupJunior Québec 2018 Challenges

Overview of Rules:

- Unless advised of the contrary, there are no age groups; teams will be grouped as belonging to either Primary or Secondary sub-leagues.
- Robots must perform autonomously: This means that remote controls of any kind are strictly forbidden; robots cannot use external power sources. Teams may use a coding program of their choice.
- Non-Lego construction components are permitted. ALL types of materials encouraged.
- Once the robot(s) is activated, team captains may ask the referee for permission to touch their robot;
- All robots must be built and programmed by student team members and team members must be able to explain their robot's construction and code.
- A scale and a 22 cm cylinder will be available to measure robots subject to size restrictions.
- Teams must present themselves to the referee 5 minutes before they are scheduled to compete.
- Updates will be listed on these pages, in RED - so please visit frequently. NEW sub-leagues have been added as well. No pressure, just try!

RoboParty Challenges

Inspired by the RoboCup Community www.roboparty.org

Teams participate in all four challenges and robots can be different for each one:

1. The Maze: Robot needs to drive through a maze without bumping into the walls (Hint: may use an ultrasonic sensor)
2. Formula 1: Car follows a black squiggle line on a Formula 1 race track (Hint: may use a color sensor)
3. Performance: A robot performs a 1 minute/ 60 seconds choreographed dance routine and entertain the audience (Hint: Be creative and entertaining)
4. Colour SumoBots: Robot is placed in an eight-sided shape on a specific colour either red, blue, green **or** yellow

The RoboParty

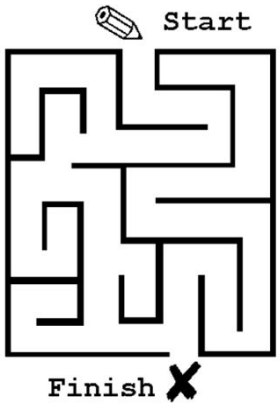
is April 13 and 14!

1.0 RoboParty Challenges (Have Fun!)

1.1 RoboParty Maze Challenge Rules

1. There are no restrictions on robot size; Maze dimensions should determine practical robot size.

2. All walls, including the entrance and the exit are, at least 30 cm apart and at least 15 cm high.
3. The floor and the walls will be white and may be textured or smooth.
4. Teams will be allowed 3 attempts or rounds and the referee will retain the best score.
5. Maximum time granted per trial is 120 seconds.
6. If a robot exits the maze in 40 seconds, it will earn (120 - 40) = 80 point = Time component;
7. A robot will lose 5 points every time it touches a wall during the each attempt = Bump component;
8. Team captain has the option of returning the robot to the entrance area if robot gets stuck; this will cancel wall bump deductions, however, the 120 seconds countdown continues.
9. Final score per round = (Time component - Bump component).
10. To prevent teams from pre-mapping the layout of the fields, walls may be removed, added or changed just before a run starts. Organizers will do their best to not change the length or difficulty of the maze when introducing these changes.



1.2 RoboParty Formula 1 Challenge Rules

Although we are evaluating individual performances, we could have a two-track set-up to make things more interesting.

1. Car follows a black curved line on a Formula 1 race track (Hint: may use a color sensor).
2. The black line will consist of electrical tape approximately 2 cm wide.
3. Teams will be permitted 3 attempts and their best time will be used to qualify for the semi finals.

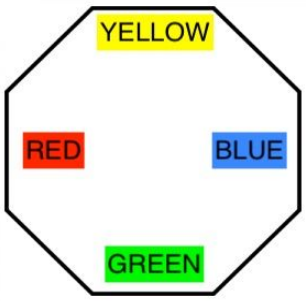
1.3 RoboParty Performance Challenge Rules

1. Teams will use their creativity to construct and decorate their robot(s) to perform a choreographed routine.
2. The performance area will be approximately 4 meters by 4 meters with a contrasting border.
3. The performance can last to a maximum of 90 seconds; teams are granted 5 minutes for set-up time before the performance and 3 minutes clean-up time after the performance.
4. The number of performing robots is limited to 4. There is no size limit.
5. Teams may provide background music on a USB key.

6. Performance evaluation by a panel of judges will be based on: Creativity, Entertainment, Costume design and programming skills.
7. Teams will perform at least 2 times and their best score will determine if they move on to the final round.

1.4 RoboParty Color SumoBots Challenge Rules

1. The goal is for an autonomous robot to push opponent(s) off the field. A robot is considered eliminated when it does not move for more than 10 seconds or it cannot return to the field.
2. The field will be approximately 1.5 meters from side to opposite side. The base of the field is black with a 4 cm white border along the perimeter.
3. The robot must be of a size that can fit (with all parts fully extended) in a cylinder with a base of 22 cm and a height of 22 cm. The mass of the robot must not exceed 1000 grams.
4. The referee will randomly distribute color balloons (Red, Blue, Green or Yellow) 5 minutes before the start of the game.



OnStage

The RoboCup Junior OnStage is an integration of Science, Technology, Engineering, Arts, and Mathematics (STEAM). Participants program their robots to move to music while their robots move and humans perform on the stage. Competitors are encouraged to lightly costume their robots with highly engaging robot movements which give their robots real personality. RoboCup Junior OnStage can be approached in a number of ways with creative new ideas appearing every year. Some previous ideas have been robots dancing together in tightly choreographed teams, students interacting with their robots while they were performing, students creating their own music, choreography, and students telling a story while the robots act it out. The OnStage challenge strongly encourages a team effort where students design their own costumes, build their robot prototypes, their costumes, on top of the programming and building.

2.0 OnStage Rules:

1. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org

2. Possibility of having 6 students in the student team, however, as usual only two are permitted on the performing stage. 6 teams members are allowed.
3. SuperTeam rules do not apply.

Rescue: Line or Maze

The Rescue competition mirrors the real-life use of robots that rescue people from life-threatening situations.

Primary Rescue is designed for Elementary students.

Robots compete by following a winding line on a series of tiles to a designated rescue area. On the way, the robot could encounter obstacles, bridges and opportunities that will challenge a programmer. While the clock is still ticking the robot must find "the victim" before pushing them out of the quicksand to safety.

Secondary Rescue is designed for Secondary students

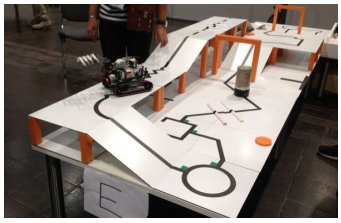
Robots compete on the same field as the Primary Rescue and play under the same rules, however, when Secondary Rescue teams reach the chemical spill they need to find "the victim" and control it (contain or lift) and then maneuver it out of the chemical spill. Finally, they need to save the robot and exit the chemical spill from where they entered.

Robots use the same tiles as Primary/Secondary Rescue, however, this time the robots can encounter some extra tiles including the challenging "gridlock". Once in the chemical spill, the Open Rescue robot is required to find and lift the victim out to the safety of a raised platform. Finally, they need to save the robot and exit the chemical spill from where they entered. A true test of a robot designers ability!

(NEW) Rescue Maze will be a offered in preparation to the International competition should you wish to try this.

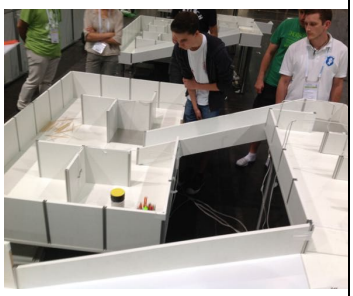
Teams will be able to participate in Rescue Maze or Rescue Line at the qualifying RoboCupJunior Québec event. The Rescue Maze challenge is open to all students. You may also prepare a program just to test it. Open Demonstration and Trials for practice are always encouraged.

3.0 Rescue Line Rules:



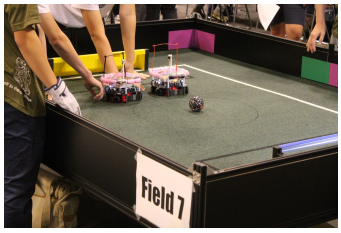
1. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org
2. Primary school teams will not be asked to pick up the balls, but simply PUSH them into a dark corner.
3. The goal is to rescue victims. There is a learning curve here and players should do their best in terms of earning points.

3.1 Rescue Maze Rules (NEW)



1. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org
2. Primary school teams will not be asked to pick up the balls, but simply PUSH them into a dark corner.

Soccer: Electronic Ball or Passive Ball



Students are required to design and program two robots to compete against an opposing pair of robots by kicking an infra-red transmitting ball into their designated goal. Teams have a choice of using two attacking robots or an attacker teamed with a goalie.

Most students choose to use LEGO Mindstorms to build and program their robots. Although the LEGO Mindstorms set can continue to be very competitive and complex, students can select alternative program platforms and even build their own microprocessor robots from basic electronic components. A range of sensors can be attached to all of the robotic platforms. These include: electronic compasses, sonar, modified light sensors and motor rotation sensors.

4.0. Soccer Rules: Electronic Ball

1. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org
2. Ignore rule 3.7 regarding "Top Markers"
3. Regarding rule 8.1: There are 3 sub-league: (a) Lightweight Primary using IR ball, (b) Lightweight Secondary using IR ball, (c) Open Primary and Secondary together using a passive orange ball (Example: Orange floor hockey ball).
4. SuperTeam rules do not apply.

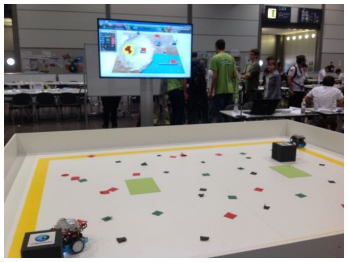
4.1. Soccer Rules: Passive ball (NEW)

1. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org
2. Ignore rule 3.7 regarding "Top Markers"
3. Regarding rule 8.1: There are 3 sub-leagues: (a) Lightweight Primary using IR ball, (b) Lightweight Secondary using IR ball, (c) Open Primary and Secondary together using a passive orange ball like a street hockey ball.
4. The ball will be approximately the same size as the electronic ball. We will probably select the orange ball used for street-hockey. (Hint: may choose to use a vision sensor such as the Pixi camera)
5. SuperTeam rules do not apply

CoSpace: Virtual and Real Robot

The CoSpace Rescue Competition is the sub-league of RoboCupJunior competition. It is available to all Elementary and Secondary students. Qualifying for International event is 12 years old.

In CoSpace Rescue, a team has to develop appropriate strategies for both real and virtual autonomous robots to navigate through the real and virtual arenas and collect objects while competing with another robot that is performing the same mission



5.0 CoSpace Rescue Rules: Virtual and Real Robots (NEW)

1. The CoSpace challenge is new to RoboCup Canada! The International RoboCup Community from Singapore introduced this challenge. For this challenge we will use the RoboCupJunior 2017 rules as found at rcj.robocup.org under the category "Rescue".
2. Website link for RoboCup CoSpace, http://cospacerobot.org/