

Guide to Japan Innovation Challenge 2018

First Version: July 30, 2018

■ Introduction

The objective of this Guide ("Guide") is to lay down rules for the Japan Innovation Challenge 2018 contest ("Contest") and ensure the safety of all personnel involved in the Contest, including participants. If you find any deficiency in these rules or need clarification, please contact the organizer.

■ Terms

Terms used in this Guide have the following meanings.

Contest

The robot contest to be held in accordance with this Guide (Japan Innovation Challenge).

Organizer

The Japan Innovation Challenge executive committee, which hosts the Contest.

Team

A unit of individuals, corporations, or other organizations participating in the Contest.

Venue

The Contest venue set forth in the Contest Venue section below.

Mission

Tasks to be completed in the Contest. Specifically, "discover" and "reach" in alpine accident search-rescue operations. For more detailed information, please see the Missions section.

■ Objective

The objective of the Contest is to accelerate the research and development of commercial robots in Japan's robot industry by presenting assistance during disasters as a specific example of a robotics application. It is also expected that more lives will be saved when robots or systems incorporating robots that completed the missions in the Contest are deployed across the country.

■ Contest period and hours

1. Contest period

The Contest will take place for three days from October 10 (Wednesday) to October 12 (Friday), 2018 ("Contest Period").

However, if any safety hazard, such as snow, is observed during the Contest Period, the Contest may be closed early.

2. Hours

The Contest will take place from 5:00 p.m. to 9:30 p.m. on each day during the Contest Period.

Each team may begin preparations at 3:30 p.m. on each Contest day. When each Contest day is over, make sure that you leave the venue by 10:30 p.m. ("Exit Deadline").

3. Days of participation

You may elect to participate on all Contest days or on only one or two.

■ Contest Venue

Forest owned by Kamishihoro-cho, Hokkaido (166 and 167, Otofuke, Kamishihoro-cho)

■ Eligibility requirements

To participate in the Contest, a team must meet all of the following conditions. Applications from joint teams of students and corporations or of multiple corporations are acceptable.

1. None of the team members, whether they are individuals, corporations or other organizations, or members of corporations or other organizations, may belong to an anti-social force.

2. An application and a preliminary review must be completed by the noon (12:00 p.m.) of September 7, 2018 (Friday) from the official contest web site (www.innovation-challenge.jp). For more details, please see the Preliminary Review section.

■ Participation fee

No participation fee will be collected for the Contest.

However, each team is required to bear transportation, accommodation, meal, and other expenses incurred with regard to participating in the Contest.

■ Form of contest

The Contest is composed of two types of missions, "discover" and "reach." Each team is required to participate in both or either of the mission types. For detailed information on each mission, please see the Missions section below.

■ Prizes

1. The first teams to complete the "discover" and "reach" missions in the Contest will be given the following prizes.

Prize for the "discover" mission: Three million yen (divided among the teams that completed the mission)

Prize for the "reach" mission: Two million yen (divided among the teams that completed the mission)

2. The prizes will be apportioned among the teams according to their earned points at the end of the Contest. The points will be earned as follows.

【Essential requirement】 "Discover" and "reach" missions

If the mission is completed: 50 points

If the mission is completed with zero accidents: Additional 50 points

3. Whether a mission has been completed or not will be judged by the organizer in accordance with the criteria. Any objection about the organizer's judgment may be presented to the organizer only by a team that actually participated in the relevant mission.

If the organizer receives an objection, it may rethink its previous judgment at its discretion.

■ Accident prevention

1. If a team has been warned of careless behavior or caused an accident twice because of its careless behavior, all of the team's records will become invalid, and the careless behavior will be detailed in a contest report. The following acts will be regarded as careless behavior.

(1) The robot is grabbed by hand before it comes to a complete halt.

(2) Any team member is not wearing the helmet he or she was given by the executive committee during the mission.

(3) The robot is manipulated during unpermitted hours or at an unpermitted place.

(4) Any other acts that would, in the executive committee's opinion, adversely affect the safety of the Contest.

2. Each team is required to undergo inspections by the organizer by the time the mission starts on each Contest day.

3. Missions may be canceled or suspended at the organizer's discretion because of bad weather conditions or safety reasons.

■ Scenario

One day in the late fall, Mr. Obihiro went climbing.

It was a mountain he had never tried before, but he decided to go alone, relying on his past experience.

He arrived at the top later than he had expected, at 15:00, and started to climb down immediately.

At around 16:00, the weather suddenly changed and snow began to fall.

At 16:30, it turned into a snow storm, and he got lost.

At 17:00, he called for rescue over his cell phone.

He didn't tell them his exact location because he didn't know it.

He has enough food and water to survive with until morning.

He has a raincoat in case of rain or other bad weather conditions, but he did not expect snow. So, he cannot stop his body temperature from falling. He would be frozen. A helicopter cannot go and rescue him because of the bad weather conditions.

Because the sun is about to set soon, the rescue team cannot enter the mountain and is preparing themselves for the next morning.

Then, his cellular phone is disconnected, possibly because of his battery running out.

Now, the rescue team decides to try robot-based rescue operations.

Because of rescue operations scheduled for the next morning, the first thing the team should try is to discover the location of Mr. Obihiro.

If his location is found out, the next step is to send a rescue robot.

It is possible that the robot may not be able to take him back because of bone fractures or the like. In such cases, the robot will leave a radio transmission device, a simple tent, blanket, and other necessary supplies at the location.

The clock is ticking. It is necessary to discover and take him back safely as soon as possible.

Now is the time for your robot.

■ General instructions

1. The robot (including a drone if you have one) must be manipulated and operated in accordance with the laws of Japan.
2. The teams are required to carefully consider safety measures and follow the organizer's instructions so that the Contest will go on safely.
3. If a team member violates any of the prohibitions, the team will be disqualified from further missions.
4. The virtual fence is a polygon with about 20 apexes.

■ Standards concerning the robot that may be used

1. There is no ceiling on the cost of a robot that may be used in the Contest.
2. The robot may be wired or wireless.

3. The robot may be operated automatically or manually.
 4. Up to two robots may be used at a time.
 5. The radio frequency used must be lawful.
 6. The organizer will not coordinate the radio frequencies to be used by teams.
 7. All robots must carry one or two tags, which each weigh about 100 g, for location tracking by the organizer.
 8. All robots will be located and monitored by the organizer during the Contest Period.
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■ General rules for the missions

1. A dummy victim will be placed somewhere in the venue by the time the mission starts.
2. It may be placed at a different location every day.
3. The location of the dummy will not be disclosed when the mission starts.

It is prohibited to find out the location by improper means.

The robot is not allowed to enter a space of three meters in radius and 10 meters in height around the dummy.

4. The teams are not allowed to use devices or tags released from their robots on previous days.
5. The teams are required to manipulate their robots from the headquarters space provided at the foot of the mountain. Team members are prohibited to go inside the virtual fence.
6. The teams will activate their robots at the starting point at any time after the mission start signal is given by the organizer. The starting point will be quite large, but you need to be careful about collisions because more than one team will start at the same time. Collision avoidance is the responsibility of each team.
7. Each team may place one board of about one meter by one meter at the starting point.
8. During Contest missions, the robot must remain inside the virtual fence. However, the robot may be returned to the starting point for recharging or repairs.
9. The robot must be able to automatically stop when it crosses the fence line. Any robot that has come to a halt, crossing the virtual fence line, will be collected by the organizer.

■ Preliminary review

Teams that have applied for participation are required to submit their mission completion plans in whatever form they prefer, by noon (12:00 p.m.) of September 7, 2018 (Friday). The plan should also address the following safety measures to apply during the night hours.

- (1) Measures to prevent the robot from hurting humans
- (2) Measures to prevent the robot from hurting other teams' robots
- (3) Measures to prevent the robot from being lost or damaged
- (4) Measures to stop the robot when it goes outside of the virtual fence
- (5) Measures to monitor the exterior of the robot
- (6) Measures to prevent the robot's battery or the like from starting to burn
- (7) Measures to determine the robot's location, and detect its abnormality if any
- (8) Measures to avoid danger in the case of the disconnection of radio wave and other malfunctions

The organizer will review the plans, and seek additional clarifications when necessary.

If any safety concern is found in a team's plan, the team will be notified and may be disqualified.

The plan will be reviewed solely by the organizer and will not be disclosed to any other teams that have applied for participation. The plan will not be returned.

■ Missions

Mission #1 is to discover a dummy placed within the venue and obtain its geolocation and photo. The rules are as outlined below.

- (1) The mission will start when a start signal is given by the organizer. (The starting order and the number of teams that will start simultaneously will be determined in consideration of the number of participating teams and so on.)
- (2) A team that has discovered the location of the dummy will obtain and send its geolocation (latitude and longitude) and a photo to the organizer's email address for inquiry.

The geolocation sent should follow the decimal notation of the world geodetic system (WGS84). Sexagesimal notation (degrees, minutes, and seconds) is not accepted.

Example) 35.6527805, 139.6906119 is acceptable; 35°39'10.0"N 139°41'26.2"E is NOT acceptable.

(3) Make it clear which part of the photo sent appears to show the dummy. The photo must be sent as an image file (with a file extension of JPG, PNG, or the like).

(4) The reference location of the dummy is its head, and an error in latitude and longitude of ± 30 meters will be accepted.

(5) The robot is allowed to release an object of not more than 100 g in weight to the outside. However, the object must be recoverable and have no effects on the environment.

Criteria for recognizing the successful completion of the mission

(1) The mission is to be completed within a specified time after start. (The time depends on the number of participating teams. It will be somewhere between 60 minutes and 90 minutes.)

(2) A photo that actually shows the dummy and its geolocation are sent to the organizer by email.

(3) The geolocation (latitude and longitude) sent is within ± 30 meters from the correct geolocation.

Mission #2 "Reach"

Mission #2 is to carry a rescue kit (a cylindrical object of about 3 kg in weight that is lent by the organizer to each team as a dummy kit that includes a radio device, blanket, and so on) near to the dummy victim. The rules are as outlined below.

(1) The mission will start when a start signal is given by the organizer. (The starting order and the number of teams to start simultaneously will be determined in consideration of the number of participating teams and so on.)

(2) The team will carry the rescue kit near to the dummy, using the robot.

(3) It is prohibited to drop an object within 30 meters from the dummy.

Criteria for recognizing the successful completion of the mission

(1) The mission is completed within a specified time after the start. (The time depends on the number of participating teams. It will be somewhere between 20 minutes and 30 minutes.)

(2) The rescue kit is carried to somewhere between three meters and eight meters from the dummy.

■ Closing

Evacuation must be completed by the Exit Deadline after the Contest is over. The robots left on the scene will be collected and returned to the teams by the organizer.

The teams are prohibited to go inside the virtual fence after the Contest is over.

Should any accident happen during the Contest, such as the crashing of a flying object, the team is required to submit an accident report, including a description of how the accident happened, to the executive committee within seven days after the end of the contest.

■ Information about the dummy victim

- (1) Human-shaped (androgynous)
- (2) The skin is made of cloth.
- (3) It wears clothing.
- (4) Its temperature may range between 30°C and 40°C, depending on its location.
- (5) It has an accelerometer, a thermometer, and a GPS device in its chest (however, information from these devices will not be made available to the teams).

These devices will be available for loan to registered participants from August 2018. Note that quantities are limited.

■ Information about the rescue kit

- (1) Cylindrical shape (about 200 mm in diameter and about 200 mm in height)
- (3) The weight is 3 kg.
- (3) It is a wooden box that can withstand a certain degree of impact.

It will be available for loan to registered participants from August 2018.

■ Prohibitions

Teams participating in the Contest and their members are prohibited for doing the following things ("Prohibitions"). If a team or any of the team members violates any of these Prohibitions, the team will be disqualified from the Contest.

- (1) Hindering the progress of the Contest or hindering any other team's operations (including, but not limited to, physical interference or radio jamming)
- (2) Participation in the missions by improper means
- (3) Non-compliance with the organizer's instructions

- (4) Violation of the Contest rules, this Guide, or the like
 - (5) Intentional destruction of the venue or its facilities, equipment or the like
 - (6) Actual or potential infringement of the property, privacy, or the like of the organizer, any other team, or a third party
 - (7) Violation of laws or regulations
 - (8) Anything else that is considered by the organizer to be as improper as any of those listed above
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■ Suspension of the Contest

The organizer may suspend the Contest at its discretion in the event that

- (1) any Contest participant, visitor, or other person is involved in an accident, gets injured, or suffers any other serious inconvenience; or
- (2) an earthquake, fire, or other natural disaster or the like happens.

■ Disclaimer concerning disputes

- 1. The organizer will not be responsible in any way for any disputes or the like that may arise between teams, between team members, or between a team or team member and a third party in connection with the Contest.
 - 2. The organizer will not be responsible in any way for any accident or other damage that may be caused to a team member or visitor, or the robot or other device or the like in connection with the Contest. All teams and visitors are advised to pay due attention to their own safety in the Contest.
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■ Public health, etc.

- 1. Meals will not be provided by the organizer and should be arranged by each team. Collect all trash and dispose of it at the appropriate locations.
- 2. The organizer will insure the team members (including the members of corporations or organizations comprising teams who actually participate in the Contest).
- 3. It is the responsibility of each team to take out property insurance for its own robot. The organizer will provide each team with up to 15,000 yen as financial support for such insurance, subject to the filing of an application together with a document certifying the insurance.

■ Copyright, etc.

1. The organizer will not assert copyright, patents, or other rights with regard to the robots and other devices and systems developed by the teams.

2. Those who completed the Contest missions are allowed to use the Contest name "Japan Innovation Challenge 2018" in accordance with the conditions of use that will be separately specified by the organizer.

■ Media interviews

1. Please note that you may be interviewed by the media during the Contest, and it is your decision on how to respond.

2. If you have any technical information, devices, or the like which you do not wish to disclose, it is your responsibility to do whatever needs to be done, such as covering them.

■ Contest visitors

The Contest will be conducted in a closed environment for safety reasons, and no visitors will be admitted.

Visitors for technical purposes may be admitted after review. The application procedure will be announced online at a later date. Visitors will be prohibited from observing from anywhere other than the seats reserved for them by the organizer.

■ Organizer

Japan Innovation Challenge 2018 Executive Committee