

Living Assistance Robot Contest Regulations

August 18, 2019 Ver.

1. Overview

(1) Contest Objective

- To promote innovations and product-oriented development of robots and other support device technologies, to enable people with disabilities to lead the same lives as able-bodied people, without wheelchairs, universally accessible design, and the like.

(2) Competition Schedule

- Two contests will be held each year (in September and March).
- The first contest will be held in September 2020.

(3) Competition Venue

- Tsukuba, Ibaraki Prefecture, Japan (The specific venue is under consideration.)

(4) Organizer

- Japan Innovation Challenge 2020 Executive Committee

(5) Task and Completion Criteria

- See attachment, “Task and Completion Criteria”

2. Entry Conditions and Team Composition

(1) Entry Qualification

- Entry qualification is unrestricted. However, team members—whether individuals, companies, other organizations, or their members—must not include persons who belong to antisocial forces.

(2) Pilots

- Pilots must have paraplegia due to spinal cord injuries.
- Pilots must be members of their teams.
- Pilots must be able to communicate smoothly with their team members and the organizer.
- Pilots must be adults.
- It does not matter how many years have passed since the onset of their disabilities.
- A team may have more than one pilot, but only one can participate in a competition.

(3) Team

- A team, including a pilot, must be composed of two or more people, including a captain (person responsible), the pilot, and a safety supervisor (a person who monitors the robot and can perform an emergency shutdown). (The pilot and captain can be the same person.)

(4) Participation Fees

- Participation is free.
- Each team is responsible for its expenses of robot development, transport, accommodation, and the like to enter the competition.

3. Robots

(1) Robot Manufacturing Expenses

- It does not matter how much or little is spent to manufacture the robots.

(2) Robot Operation

- Robots may be operated either automatically or manually.
- Only pilots may operate manually operated robots during the competition.
- Remote control from outside is not allowed.

(3) Minimum Features Required

- Each robot must have a safety mechanism for contacting external entities (dialing 1-1-9, etc.) for help and communicating information required for rescue within 30 seconds of the pilot falling over, starting to feel sick, or the like during the competition.
- Each robot must have a monitoring mechanism for remotely monitoring whether the robot is operating properly during the competition.
- Each robot must have a shutdown mechanism that can perform an emergency robot shutdown in response to unforeseen circumstances that may occur during the competition, and the team and organizer must be able to operate the shutdown mechanism at all times.
- In a preliminary screening that takes place before the competition, each team must prove that their safety mechanism, monitoring mechanism, and shutdown mechanism work properly.

(4) Power Supply

- Power can be supplied from outlets.
- 100 V, 50 Hz: Japanese specifications for household outlets (type A)
- Up to 40 A may be used.

(5) Legal Compliance

- Participants must comply with the laws of Japan.

4. Competition

(1) Common

- Once the competition starts, pilots may not use wheelchairs.
- It is against the rules to give instructions to the pilot between the start and end of a competition. If there is a risk of an accident, terminate the competition and give instructions promptly.

(2) Safety Mechanism

- Teams must use their monitoring mechanisms to constantly monitor whether their robots are operating properly.
- Teams must use their shutdown mechanisms to shut down their robots when their robots behave in unexpected ways.
- The organizer shall use the shutdown mechanisms to shut down the robots when it judges that the pilots are in danger.
- The organizer shall provide pilots with safety vests that prevent them from falling over. Pilots must wear the safety vests.
- The safety vests are outfitted with ropes that hang down from the ceiling and a mechanism that stops delivery of the ropes when their delivery exceeds a certain speed.

(3) Accident Reports

- If there is an accident during the contest, the team involved is obligated to submit a written accident report that includes the particulars of the accident to the Executive Committee within three days of the end of the competition.

(4) Prohibitions

Teams and their members participating in this contest are prohibited from the following:

- Participating in competition tasks by devious means
- Emitting sounds of 80 or more decibels when measured at a distance of 1 meter around the robot
- Acts that go against any instructions of the organizer
- Acts that the organizer deems inappropriate
- Other acts that the organizer deems would have an adverse effect on contest safety

5. Schedule

(1) Application

- Each team must submit an application online at least two months before each contest.
- Each team must prepare a written plan following a template and submit it with their application.

(2) Document Screening

- The organizer screens the written plans and informs the teams, within two weeks, as to whether they passed or failed the document screening.
- The main points confirmed during the document screening are as follows:
 - i. Task completion
 - ii. Safety considerations
 - iii. Practical applicability

(3) Preliminary Screening

- A preliminary screening is to be held at least one month before each contest.
- After the document screening, the organizer will inform the teams of the preliminary screening schedule.
- The preliminary screening consists of demonstrations performed by the teams and a health checkup for pilots.
- During the demonstrations, the actual pilots will perform, five or more times, the tasks to be completed in the contest, and it will be confirmed that they can all be performed without risk of accident.
- The organizer views the demonstrations and informs the teams, within two weeks, as to whether they will be allowed to participate in the contest.

(4) Contest

- Contest schedules may span multiple days, depending on the number of participating teams.
- The organizer will inform the teams of contest schedules after the preliminary screening.

6. Competition Procedure

(1) Idle Time

The time between competitions

(2) Preparation time: 15 minutes

Teams use this time to prepare in the Staging Area.

Even if a team completes its preparations in less than 15 minutes, preparation time cannot be ended early.

(3) Presentation time: 5 minutes

Teams use a microphone and slides to present the technology they intend to use to complete the tasks.

(4) Competition Start

The competition begins when the organizer gives the signal after the presentation is complete.

(5) Competition Time

Teams start with Task 1, and proceed through the tasks in numerical order.

(6) Competition End

The competition ends when the organizer gives the signal. Teams immediately move their pilots to ensure their safety. Teams do not operate their robots until the organizer gives the signal (the organizer uses this time to judge the completion of the tasks).

(7) Removal Time

When the organizer gives the signal, teams gather and remove their equipment.

(8) Team Switching Time

When the organizer gives the signal, the team whose competition ended gathers and removes their equipment. When the organizer gives the signal, the next team to compete enters the Staging Area.

• Judgement of Task Completion

When the competition ends, the organizer judges the completion of the tasks. It can take time for judging and results might not come out immediately.

- Competition Suspension

The competition is to be suspended when a team or organizer judges that suspension is necessary.

- Competition Restart

When a team or the organizer has suspended a competition, the competition may restart at the organizer's discretion.

- Competition Termination

The competition is to be terminated when a team or organizer judges that termination is necessary.

- Contest Termination

The organizer, at its discretion, may terminate the contest in any of the following situations:

- i. If a spectator, team member, staff member or other person involved has an accident, gets injured, or the like
- ii. If a team gives instructions to its pilot
- iii. If there is a natural disaster such as an earthquake, fire, or the like
- iv. If there is some other reason for the organizer to deem termination necessary

7. Definition of Areas and Structures

(1) Staging Area

Only the presently competing team may enter the Staging Area during the competition.

The next team to compete may enter the Staging Area during team switching time.

(2) Competition Area

There are structures in the Competition Area.

A team may enter the Competition Area during preparation time.

Only the pilot of the presently competing team may enter the Competition Area between the start and end of a competition.

The positions of chairs and other accessories in the Competition Area might be changed.

The positions of beds and other furniture in the Competition Area might be changed.

(3) Viewing Area

Teams, members of the media, and observers may enter the Viewing Area.

(4) Photography Area

Only photography staff members and members of the media may enter the Photography Area.

(5) Adjustment Room

An Adjustment Room is to be located near the venue for adjusting support equipment.

(6) Structures

- The structures are models of houses.
- The walls are translucent, but must not be treated as though they are translucent.
- There are no ceilings, but the structures must not be treated as though there are no ceilings.

*Shouldn't there be ceilings, then?

8. Other

(1) Preparation and Test

- When the venue is open, it may be used for preparations.
- Contact the organizer two weeks in advance since staff members must be there too.

(2) Adjustment Room

- Teams may use the Adjustment Room to adjust their robots.
- Adjustments that make a loud noise are prohibited after sunset.

(3) Robot Exhibition

- Teams may use the venue for exhibits that introduce themselves and their robots.
- Venue space will be provided for introductions using videos and posters.
- Each team must take its own theft prevention measures.

(4) Insurance

- Each team must enroll in necessary insurance on their own.
- The organizer shall pay insurance premiums of up to 50,000 yen for each team.

(5) Disclaimer

- The organizer shall assume no responsibility whatsoever for any accidents that occur before, during, or after the contest. Teams must give sufficient consideration to safety.

Attachment: Tasks and Completion Criteria

Table 1 Task and Prize Money, List of Completion Criteria

Task 1		Going to the toilet at night	Completion prize: \$100,000
Main actions	Move from bed to toilet Use toilet Return to bed		
Completion criteria	Contestant can use the toilet within 1 minute from the start (mark on underwear visible) Contestant can wipe Contestant can return to bed Contestant completes task within 10 minutes		

Task 2		Getting dressed	Completion prize: \$50,000
Main actions	Move from bed to washroom Wash face Brush teeth Change clothes Sit on sofa		
Completion criteria	Contestant can remove mark from teeth Contestant can remove mark from face Contestant can change top and bottom clothes (specialized outfits are permissible) Contestant can sit on sofa Contestant completes task within 15 minutes		

Task 3		Meal	Completion prize: \$50,000
Main actions	Prepare a meal Eat the meal Wash the dishes Put the dishes away		
Completion criteria	Contestant can take a bento (prepared meal) out from the refrigerator and heat it up in a microwave Contestant can sit at a table and eat the meal Contestant can remove marks from dishes Contestant puts dishes back in cupboard		

	Contestant completes task within 15 minutes
--	---

Task 4	Laundry	Completion prize: \$50,000
Main actions	Do the laundry Hang the laundry on the veranda Fold the clothes and put in the dresser	
Completion criteria	Contestant can put the clothes in the washing machine Contestant can start the washing machine Contestant can hang the laundry on the veranda Contestant can take down the laundry, fold it, and put it away in the dresser Contestant completes task within 15 minutes	

Task 5	Receive a package	Completion prize: \$50,000
Main actions	Answer when the doorbell intercom chimes Go to the front door to receive a package Receive a package and put it in the refrigerator	
Completion criteria	Contestant can pick up the receiver within 15 seconds of the intercom chiming Contestant can receive the package at the front door within 30 seconds of picking up the receiver Contestant can put the package into the refrigerator without upsetting it Contestant completes task within 15 minutes	

Task 6	Cleaning	Completion prize: \$100,000
Main actions	Clean with a vacuum cleaner Take the trash out to the trash area	
Completion criteria	Contestant removes trash from the floor Contestant can put trash from the vacuum cleaner into a trash bag Contestant can tie the trash bag closed Contestant can place the trash bag at a designated location outside the house Contestant completes task within 15 minutes	

Task 7	Shopping	Completion prize: \$150,000
Main actions	Leave the house and walk Cross a crosswalk while holding an open umbrella Cross a crosswalk while holding a shopping bag Return home	

Completion criteria	<p>Contestant can put shoes on and leave from the front door</p> <p>Contestant can cross a crosswalk within 30 seconds while holding an open umbrella</p> <p>Contestant can cross a crosswalk within 30 seconds while holding a 3-kg shopping bag</p> <p>Contestant can remove shoes at front door and get back into the house</p> <p>Contestant completes task within 15 minutes</p>
---------------------	---

Task 8	Bus	Completion prize: \$150,000
Main actions	<p>Wait for a bus outside house</p> <p>Get on the bus when it arrives</p> <p>Pay fare with an IC card</p> <p>Get off the bus</p>	
Completion criteria	<p>Contestant can climb one step to get on a bus within 15 seconds of it arriving</p> <p>Contestant can touch an IC card to the reader</p> <p>Contestant can take a seat within 15 seconds of finishing to climb up the bus's step</p> <p>Contestant can get down from the bus's step within 30 seconds of standing up</p> <p>Contestant completes task within 15 minutes</p>	

Task 9	Preparing a bath	Completion prize: \$100,000
Main actions	<p>Clean the bathing area</p> <p>Draw a bath</p>	
Completion criteria	<p>Contestant can remove the marks from the bathtub and bathing area</p> <p>Contestant completes task within 15 minutes</p>	

Task 10	Bathing	Completion prize: \$200,000
Main actions	<p>Take clothes off and soak in the bath</p> <p>Take a shower and wash the body</p> <p>Get out of the bathing area and dry the body</p> <p>Get dressed and dry hair</p>	
Completion criteria	<p>Contestant can soak in the bath for at least 10 minutes</p> <p>Contestant can remove marks from all over the body</p> <p>Contestant can get dressed within 15 minutes</p> <p>Contestant can dry hair for at least 5 minutes</p> <p>Contestant completes task within one hour</p>	

EoF