



Global Innovation Challenge 2021
Living Assistance Robot Award

Application Guidelines
3rd Edition

Global Innovation Challenge Executive Committee

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I Introduction

I.1 Introduction

This Global Innovation Challenge 2021 Living Assistance Robot Award Application Guidelines (hereinafter, the "Application Guidelines") describe the criteria for selection, etc. for the Global Innovation Challenge 2021 Living Assistance Robot Award (hereinafter, the "Award"). As the Application Guidelines may be revised after publication, please refer to the latest version on the official website. Please contact the Organiser if you have any questions or concerns about this Application Guidelines.

Contact: inquiry@global-innovation-challenge.com

Official Website: <https://global-innovation-challenge.com/>

1.2 Update History

Last Updated.	Version
8/20/2020	1st Edition
12/8/2020	<p>2nd Edition</p> <p>Key Changes</p> <p>2.3 Schedule</p> <ul style="list-style-type: none"> • Addition of reference time description • Award Ceremony schedule <p>2.6 Cost burden</p> <p>Postscript</p> <p>3.1 Team</p> <ul style="list-style-type: none"> • 3.1.2 Partially deleted • 3.1.4 Added <p>3.2 Target Robot</p> <ul style="list-style-type: none"> • Deletion of target robot definition • Correction of residential environment definition <p>3.3.2 Document screening and field survey</p> <ul style="list-style-type: none"> • Change of field survey to remote judging <p>Appendix Task 1</p> <ul style="list-style-type: none"> • Addition of video link <p>Appendix Task 2</p> <ul style="list-style-type: none"> • Correction of the description about the accomplishment of the Task • Renaming of technical issues to technical elements
2/5/2021	<p>3rd Edition</p> <p>Key Changes</p> <p>2.3 Schedule</p> <ul style="list-style-type: none"> • Award Ceremony schedule <p>3.3.2 Document Screening and Remote Judging</p> <ul style="list-style-type: none"> • Change of technical elements to individual actions <p>Appendix Task 3</p> <ul style="list-style-type: none"> • Addition of taking the bread out of the toaster <p>Appendix Task 6</p> <ul style="list-style-type: none"> • Addition of closing the front door

2 Award Summary

2.1 Purpose and Objectives

Commitment to "independent walking"

The number of people who need assistance in their daily lives is increasing all over the world due to illness, accidents, and aging, among others. Both the caregivers and the assisted are burdened mentally, physically, and economically. And yet commercial investment in robotics development in the welfare sector is limited due to the relatively small market.

With the development of public infrastructure and barrier-free accessibility, it is now more convenient to use a wheelchair to carry out everyday activities than before. However, the reality is that places not designed for people with disabilities put restrictions on their activities. For example, when you visit a friend's house, you might come across steps in the entrance or hallway of a typical home, or insufficient space for a wheelchair. In such cases, what if there were a robot - usable indoors and outdoors - without worries about barrier-free access? It would allow people with disabilities to use different tools depending on the situation and enjoy their lives more freely and in a way that suits them better. In our research, the Global Innovation Challenge Executive Committee have heard from some paraplegics who wish to be able to "walk with independence".

Considering this, the Global Innovation Challenge Executive Committee will engage in the following activities with the aim of realizing a world in which people with disabilities such as paralysis of the lower limbs can live without the assistance of others and without the use of a wheelchair.

1. Challenge to "independent walking *" utilizing the remaining functions
2. Providing available options in daily life

To accelerate this process and achieve the goal, we will continue to hold the "Global Innovation Challenge Living Assistance Robot Award" every year and open the door to the future.

※ For this Award, "independent walking" refers to a person with a disability such as paralysis of the lower limbs who has been forced to live in a wheelchair and is then able to walk without the assistance of others or without using a wheelchair.

2.2 Organiser

The Global Innovation Challenge Executive Committee (hereinafter, the

"Organiser") has been established to realize section 2.1 "Purpose and Objectives" above. It is operated with advice from experts in the fields of medical welfare, sports for the disabled, robotics, etc.

2.3 Schedule

This Application Guidelines is based on Japan Standard Time (JST).

- Entry period: September 1, 2020 – February 28, 2021
- Selection period: December 1, 2020 – June 30, 2021
- Publication of selection results: July 1, 2021
- Award Ceremony: September 12, 2021 (scheduled)

2.4 Venue for the Award Ceremony

GIC Tsukuba Innovation Center (former Sugama Elementary School)

877 Nakasugama, Tsukuba, Ibaraki 300-4242, Japan

Google Maps URL: <https://goo.gl/maps/GFA4XEWKVu8iDxEK9>

2.5 Criteria for Selection

Seven Tasks (see Section 4.1 "Criteria for Selection" and Appendix 2 "Accomplishment of Each Task") will be set up based on activities of daily life.

Teams that have entered this Award and passed the document screening and teams that have entered by the recommendation of the Organiser based on its own research will enter the Award.

The Organiser confirms the functions of the award-winning robots by document screening and remote judging and selects candidates who can achieve one or more of the seven Tasks as the winning team.

2.6 Fees and Entry Costs

There is no charge for entry to this Award. Any costs incurred by the team during the selection process, from entry to the determination of the winning team, such as facilities, personnel, travel, insurance, etc, required for the submission of the entry form and the conduct of the remote judging, will be borne by the Organiser, to a reasonable extent, upon prior consultation with the team.

The costs of transportation, lodging, meals and demonstrations for the winning organization or team to attend the Award Ceremony will be also covered by the Organiser, to a reasonable extent.

3 Entry

Teams wishing to enter the Award must follow the terms and conditions and sequence of entry below.

3.1 Team

- 3.1.1 Individuals or organisations researching and developing robots are eligible for this Award. More than one organisation may join to enter this Award as a team.
- 3.1.2 There is no restriction on the nationality of team members.
- 3.1.3 Team members must not belong to any organized criminal groups, such as gangs or terrorist groups.
- 3.1.4 Among the members of the team, the person who directly attaches and uses the robot is the pilot. The pilot must be a quadriplegic or a paraplegic due to spinal cord injury or other causes. A paraplegic will be defined as an individual with an AIS (ASIA Impairment Scale) rating of A to B or a Frankel Classification rating of A to B. No upper limb impairment is required for paraplegics.

3.2 Target Robot

- 3.2.1 The target robot that is eligible for this Award is "an intelligent mechanical system that possesses the three elemental technologies of sensors, intelligent/control systems, and drive systems" and is a device or tool that supports the independent walking of a paraplegic person without the assistance of others.
- 3.2.2 There are no restrictions on the shape, weight, size, etc of the robot if it can be used in a general residential environment. The Organiser presents a specific example of the residential environment in "Attachment I. Drawings for Temporary Housing", but this is not an absolute standard.
- 3.2.3 A robot used in contact with a person with lower limb paralysis is eligible for this Award. Movement of the robot alone is not allowed.
- 3.2.4 The robot may be operated automatically or manually. However, in the event of manual operation, the robot must be operated by the user and must not be operated from outside except for safety reasons.
- 3.2.5 The number of robots used is limited to one for all Tasks entered.
- 3.2.6 Robots that are difficult to use in real life, for example those that are excessively noisy, are not eligible for judging.
- 3.2.7 There is no limit to the cost of building a robot.
- 3.2.8 Robots that infringe or are likely to infringe on the intellectual property rights or other rights of a third party and robots that violate or are likely to violate other

applicable laws and regulations are not eligible for this Award.

3.3 Entry to Selection Process

3.3.1 Entry

Please download the entry form from the official website of the Award and fill out all the necessary information and submit your entry via the official website within the stipulated entry period below.

Entry period: September 1, 2020 – February 28, 2021

3.3.2 Document Screening and Remote Judging

The Organiser will screen the documents based on the entry forms submitted by the teams.

Once the teams have passed the document screening, the Organiser will conduct a remote judging via a web conferencing service. During the remote judging process, the pilot will be asked to demonstrate the Task. They will also be asked to demonstrate several individual actions after the end of task demonstration. For more information on the Tasks and individual actions, please refer to Appendix 2 (Accomplishment of Each Task) and the Global Innovation Challenge 2021 Selection and Judging Guidelines, which are available on the official website of the Award.

Remote judging period: December 1, 2020 – June 30, 2021 (approximately 2 days per team)

3.3.3 Award Notification

The Organiser will notify the teams that have developed robots that meet the criteria for the Award.

Award notification date: July 1, 2021

4 Selection

4.1 Criteria for Selection

4.1.1 Tasks

In this Award, seven Tasks that can occur in daily life are set, and the criteria for selection are if a person with lower limb paralysis can accomplish the Tasks using a robot. For details on the criteria for accomplishment of the Tasks, please refer to Appendix 2. The following is an overview of the Tasks.

- Task 1 - Toilet

The Task is to move to the toilet and use it

- Task 2 – Preparation
The Task is to wash face after getting dressed
- Task 3 – Meal
The Task is to place a prepared meal on the table and sit down to eat
- Task 4 – Laundry
The Task is to wash laundry, and take laundry from the line, fold clothes and put them into the wardrobe
- Task 5 – Package Receiving
The Task is to receive a delivered package, unwrap it and place the contents in the refrigerator
- Task 6 – Cleaning
The Task is to clean the inside of the house with a vacuum cleaner and take the trash bags out of the house
- Task 7 – Bathing
The Task is to move to the bathroom with clothes to change and soak in hot water in the bathtub.

4.1.2 Task Groups

The Tasks for this Award are divided into three Task groups.

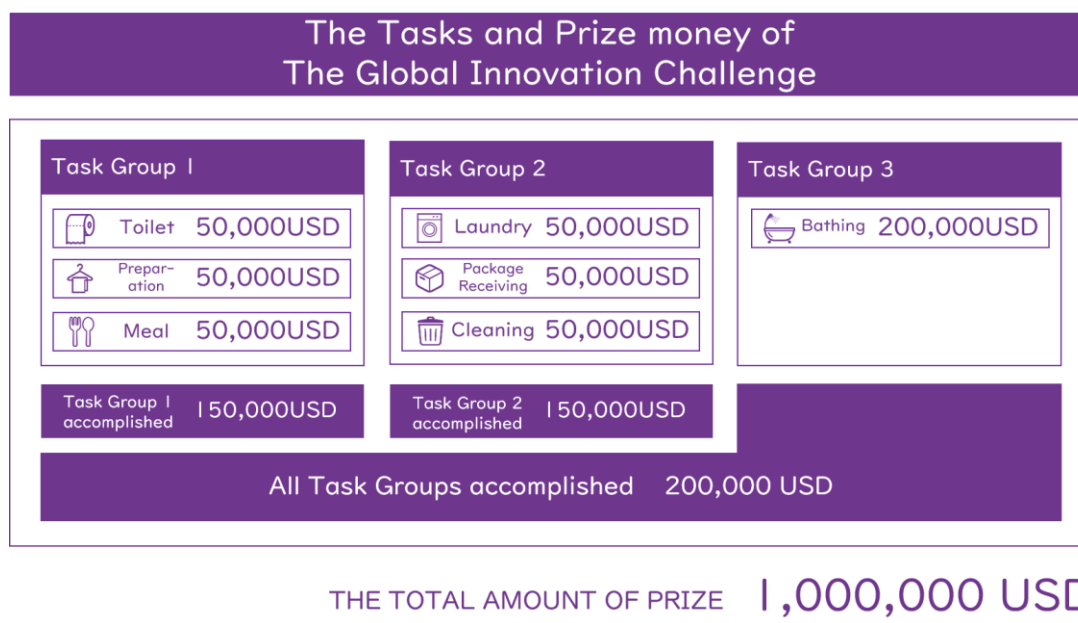
1. Task group 1 includes three Tasks: Task 1 "Toilet", Task 2 "Preparation", Task 3 "Meal".
2. Task group 2 includes three Tasks: Task 4 "Laundry", Task 5 "Package Receiving", Task 6 "Cleaning".
3. Task Group 3 consists of Task 7 "Bathing".

4.1.3 Notes on the Tasks

- Teams can enter any Task or multiple Tasks.
- Selection will be made by the Organiser in a manner determined by the Organiser.
- The Organiser may not approve the accomplishment of the Tasks if fraudulent acts such as false information about the team are discovered, or if other facts about the team that the Organiser deems inappropriate are discovered.

4.2 Prize Distribution

As shown in Figure 1 below, the Organiser will provide a total of 1,000,000 USD in cash prizes for all Tasks.



<Figure 1: Global Innovation Challenge and its prizes>

4.2.1 Prize money for each Task

The prize money for each Task is as follows

- Task 1 - Toilet 50,000 USD
- Task 2 - Preparation 50,000 USD
- Task 3 - Meal 50,000 USD
- Task 4 - Laundry 50,000 USD
- Task 5 - Package Receiving 50,000 USD
- Task 6 - Cleaning 50,000 USD
- Task 7 - Bathing 200,000 USD

4.2.2 Prize money for the Task Groups

The team that first completes all the Tasks in the Task Group specified in "4.1.2 Task Groups" at the same time will be awarded the prize of the Task Group in addition to the prize of each Task. The prize money for each Task group is as follows

- Task Group 1 accomplished: 150,000 USD
- Task Group 2 accomplished: 150,000 USD
- All Task Groups accomplished: 200,000 USD

4.2.3 If more than one team completes a previously uncompleted Task or Task Group at the same time in the same Award, the prize money will be divided equally

between the teams.

4.2.4 Prizes will not be awarded for Tasks or Task Groups that have already been accomplished by other teams, including previous Awards.

4.2.5 The prize money will be awarded within one month after the conclusion of the Award Ceremony. If, after the Award has been completed, a team is found to be misrepresenting false information or engaging in any other fraudulent activity that the Organiser deems inappropriate, the Organiser reserves the right to cancel the prize.

5 Award Ceremony

5.1 Award Ceremony

The teams that are notified of their award will participate in the Award Ceremony at the GIC Tsukuba Innovation Center as the winning organization. At the Award Ceremony, there will be a presentation of Awards and demonstrations by the winning teams. The demonstrations will be held in a temporary residential environment set up at the venue to simulate an actual house. Winners that are unable to participate in the Award Ceremony at the venue may be allowed to participate online.

6 Other

6.1 Confidentiality

The Organiser will not use the confidential information on robotics and other technologies obtained during the judging process for any purpose other than the judgement. The submitted confidential information will be stored in strict confidence for a certain period using an appropriate method and then destroyed. The confidential information will not be disclosed without the team's permission. This does not apply if the information is public knowledge, or it was already in the possession of the Organiser prior to the judging process, or it was legally obtained from a third party without any obligation of confidentiality, or it has been mutually confirmed as exceptional information by the Organiser and the owner of the information. The Organiser may also disclose confidential information to the extent necessary to comply with the law or a court order, regulatory authority, or other public body with the authority to regulate the Organiser. In the event of such a disclosure, the Organiser will contact the team in the subject in advance (or, if unavoidable, afterwards).

6.2 Photography

The Organiser may photograph, film, record, or videotape the Award Ceremony and demonstrations, etc., and distribute them over the Internet or otherwise, or post them in printed materials, etc., for the purpose of promoting the Award and related events such as promoting technological development and commercialization in the field of Living Assistance robots, etc. In addition, the Organiser may distribute the team and its members' likenesses, names, self-introductions, and other information via the Internet or other media or post them in printed materials for the purpose of promoting the Award and related events. However, the privacy of all parties involved, including the team, will be taken into consideration and the information will not be used for any purpose other than that for which it was intended.

6.3 Indemnity and Damages

The Organiser will not be liable for any accidents, theft, loss, disputes, or information leakage that may occur to the team or its officials before, during, or after the entry, selection, and Award Ceremony periods of this Award. Teams are responsible for preventing accidents at their own risks. To the extent permitted by applicable law, the Organiser will not be liable for any other damages incurred by the team or its officials because of the team's participation in the Award. In addition, the team and its officials will be liable for all damages caused to the Organiser or its officials or to other teams or other third parties in connection with this Award.

6.4 Media Coverage

There is a possibility that you may be interviewed by television, newspapers, web media and other media in connection with this Award. When the media contact the Organiser to interview the team, they will try to get the team's permission before they do so.

6.5 Cancellation of the Award

The Organiser may cancel or reschedule the Award if the Organiser determines that the Award cannot be held due to an accident involving the Organiser, any member of the team or any other person involved, or due to an earthquake, outbreak or spread of an infectious disease, or any other reason. In the event the Award is cancelled, no prize money will be awarded to any team. The Organiser cannot be held liable for any damages caused to entrants or other third parties because of the Award's cancellation.

6.6 Revised Application Guidelines

The Organiser may revise these Application Guidelines from time to time as it deems necessary. The revised version will be posted on the Award's official website.

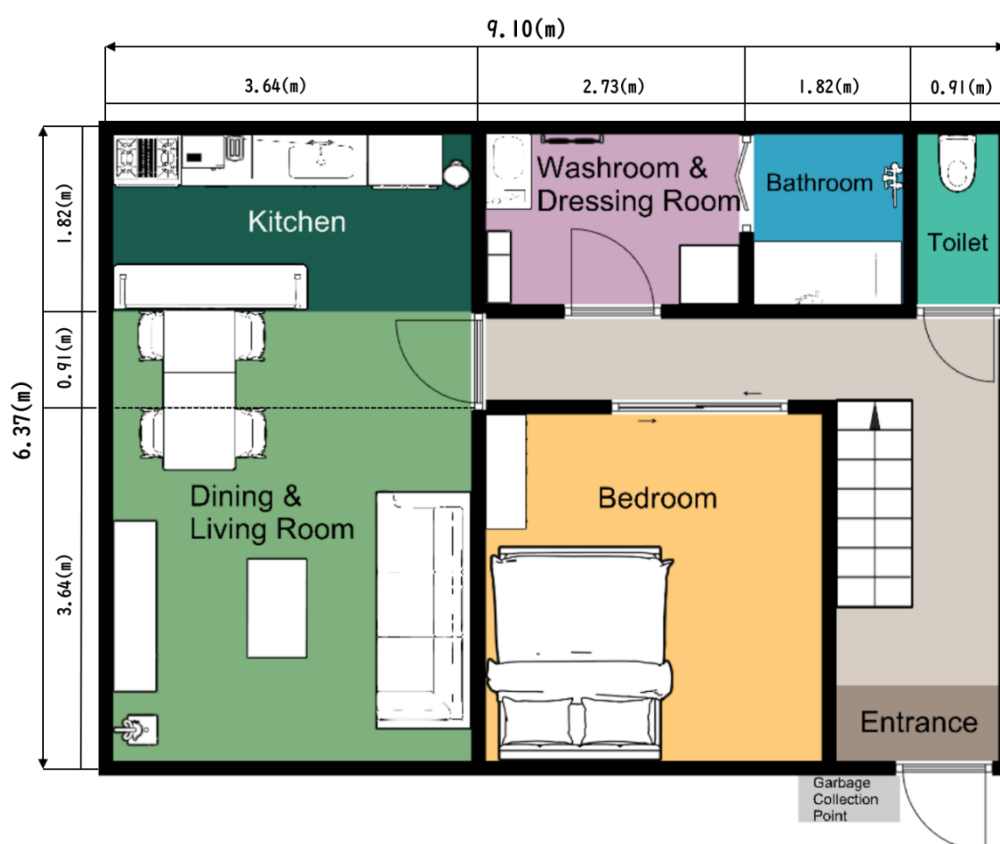
6.7 Dispute Resolution

The laws of Japan shall apply to the rights and obligations in relation to the Terms and Conditions and the Award, and all disputes in relation to the Terms and Conditions and the Award shall be subject to the exclusive jurisdiction of the Tokyo District Court as the court of first instance.

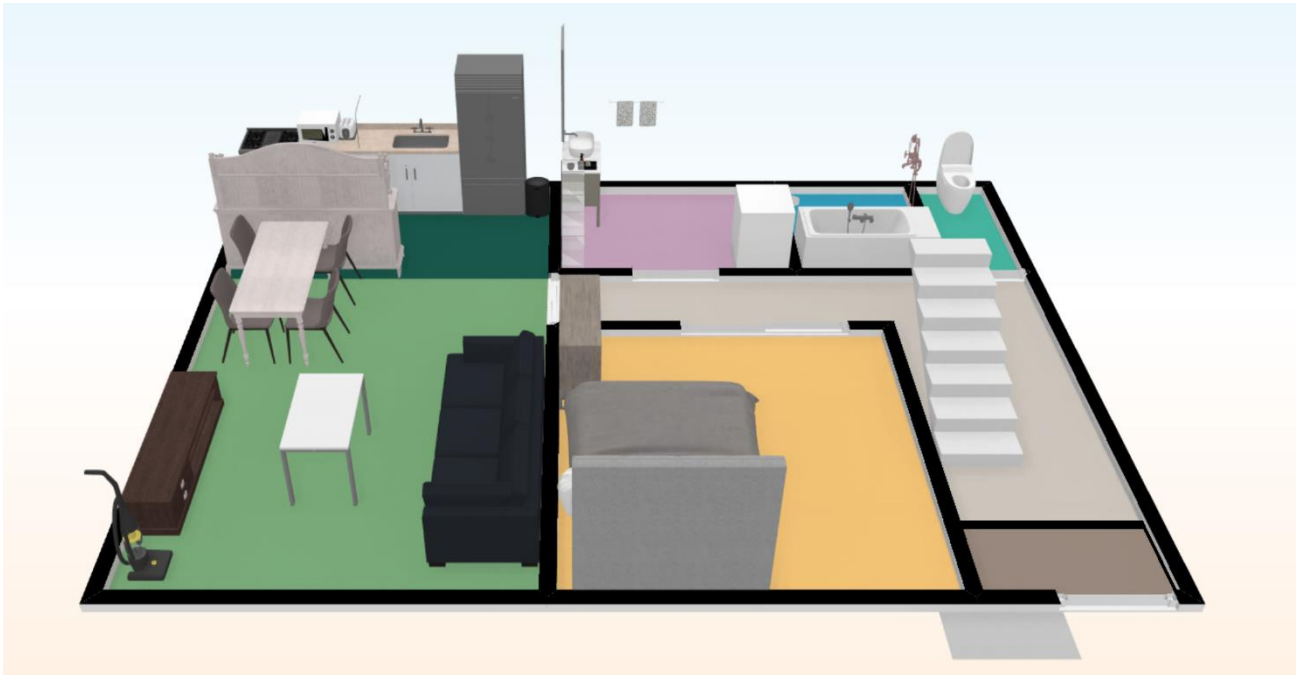
Appendix.

I. Drawings for Temporary Housing

The drawings below are floor plans and 3D drawings of the temporary residential environment in the GIC Tsukuba Innovation Center where the winning organization will demonstrate. The information in the drawings (e.g., size of the temporary residential environment and details of fixtures) is subject to change.



<Figure 2: Temporary residential environment at the GIC Tsukuba Innovation Center>



<Figure 3: 3D drawing of temporary residential environment >

2. Accomplishment of Each Task

For each of the seven Tasks, the following are assumed to be the actions to be performed, including the starting and ending conditions. The reference time set for each Task is used as a guide to determine whether the main movement elements of the Task can be accomplished, considering the totality of the Task.

TaskI 「Toilet」

Reference Time
5 minutes

①Bedroom→②Toilet→③Washroom&Dressing Room→④Bedroom



Task I - Toilet

Description of the Task:

Start in bed in your pyjamas. Sit up and put the robot on. Get up from the bed and move to the toilet. Once in the toilet, close the door. Drop your trousers and sit on the toilet seat. Then get up from the toilet seat and raise your trousers. Pull the flush lever. Exit the toilet and close the door. Move to the washroom and wash your hands, wipe your hands with the towel hanging in the washroom. Return to the bedroom and sit on the bed to complete the Task.
(Sample Video ([Youtube](#)))

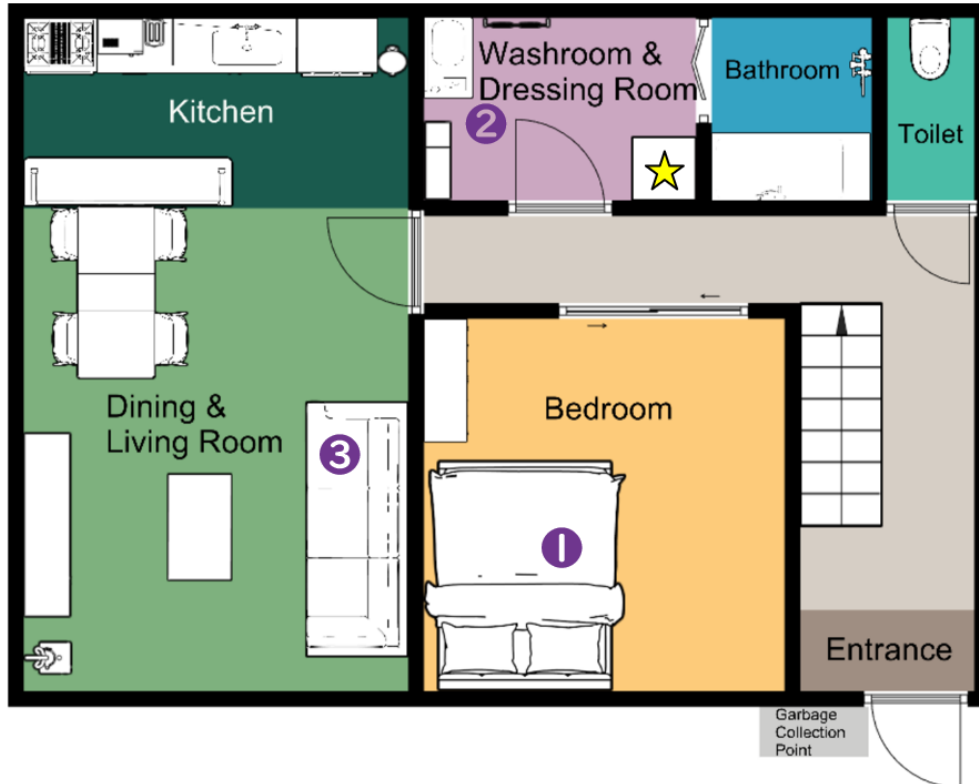
Technical elements:

- | | |
|--|--|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time in a tight space | ■ Standing up from a chair/ sitting down |

Task2 「Preparation」

Reference Time
6 minutes

①Bedroom→②Washroom&Dressing Room→
③Dining&Living Room



Task 2 - Preparation

Description of the Task:

Start from a sitting position on the bed. Put the robot on and move to the bathroom. Take a towel from the rack. Fill the basin with water and with both hands wash your face three times. After wiping your face with the towel, place the towel in the basket in front of the washing machine (marked with a star) and move to the living room. Once in the living room, close the door and sit on the couch to complete the Task.

Technical elements:

- | | |
|--|--------------------------------|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time | ■ Taking a seat |
| ■ Working with both hands | ■ Forward leaning posture |

Task3 「Meal」

Reference Time
6 minutes

① Dining&Living Room → ② Kitchen →
③ Dining&Living Room → ④ Kitchen → ⑤ Dining&Living Room



Task 3 - Meal

Description of the Task:

Start by sitting on the living room couch. Put the robot on and move to the kitchen. (1) put the bread in the toaster, (2) transfer food from the frying pan to a plate, and (3) serve soup into a bowl from another pan. (4) Remove a drink from the refrigerator and pour it into a cup. (5) take the bread out of the toaster. Bring all four of these prepared items to the table. Then take a seat in a dining room chair in the living room. Take a spoon and fork from the table, make a sign (ex. clasp your hands). After that, make a sign again which means the end of a meal and carry the empty dishes into the kitchen. Place all the dishes in the dishwasher (marked with a star) and press the start button. Return to the living room and sit on the couch to complete the Task.

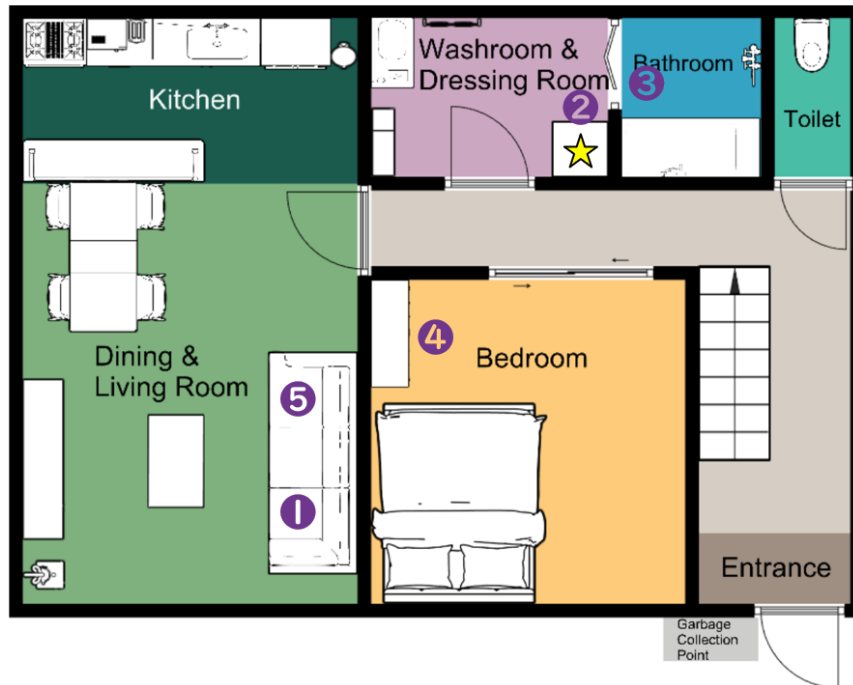
Technical elements:

- Practical uptime/weight/durability
- Walking and changing direction in a narrow space
- Standing up from a chair/ sitting down
- Walking with food
- Practical walking speed
- Putting on/removing the robot in a short time
- Working with both hands

Task4 「Laundry」

Reference Time
9 minutes

① Dining & Living Room → ② Washroom & Dressing Room →
③ Bathroom → ④ Bedroom → ⑤ Dining & Living Room



Task 4 - Laundry

Description of the Task:

Start from a sitting position on the living room couch. Put the robot on and move to the washroom. Take clothes from the basket and put into the washing machine (marked with a star), add detergent and fabric softener, and press the start button on the washing machine. Then take the clothes out of the washing machine and hang them in the bathroom. Take in another piece of laundry that was hung out to dry. Fold the laundry (it doesn't matter where you fold it) and carry it to the bedroom and put it away in the wardrobe. Move from the bedroom to the living room and close the door after you enter the living room. Sit on the living room couch to complete the Task.

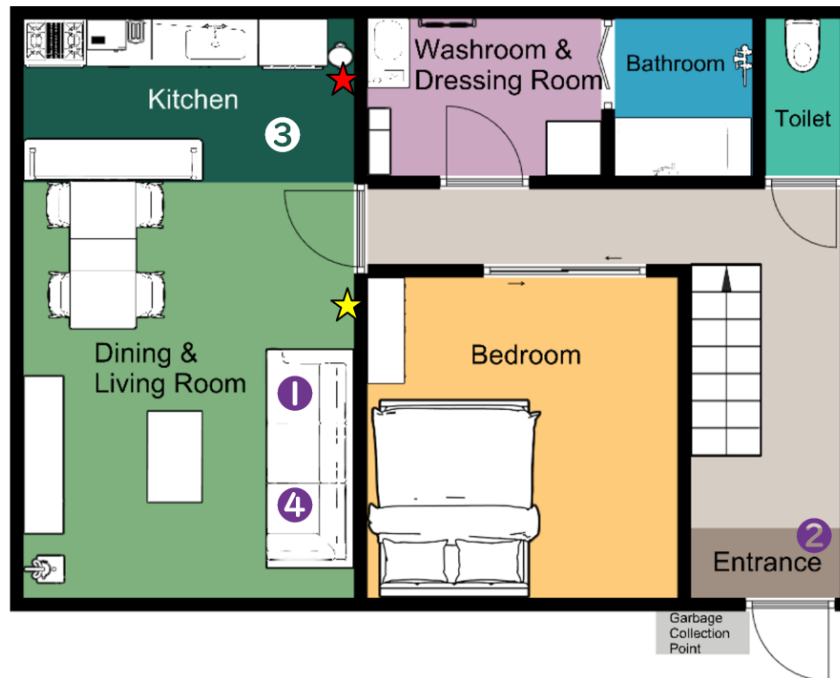
Technical elements:

- | | |
|--|--|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time | ■ Standing up from a chair/ sitting down |
| ■ Working with both hands | ■ Work in a low/forward leaning position |
| ■ Walking with a load | |

Task5 「Package Receiving」

Reference Time
5 minutes

①Dining&Living Room→②Entrance→
③Kitchen→④Dining&Living Room



Task 5 - Package Receiving

Description of the Task:

Start sitting on the couch in the living room. Put the robot on and get up from the couch. Move to the intercom (marked with a yellow star) and answer it. Then move to the front door with the steps (about 20cm) and receive your package (a cardboard box of about 1.5 kg, 32 cm x 25 cm x 11 cm). Take the package and close the front door. Then move to the kitchen, open the package, and put its contents in the refrigerator. Fold the cardboard box and place it in the kitchen trash can (marked with a red star). Move from the kitchen to the living room and close the door after you enter the living room. Sit on the couch to complete the Task.

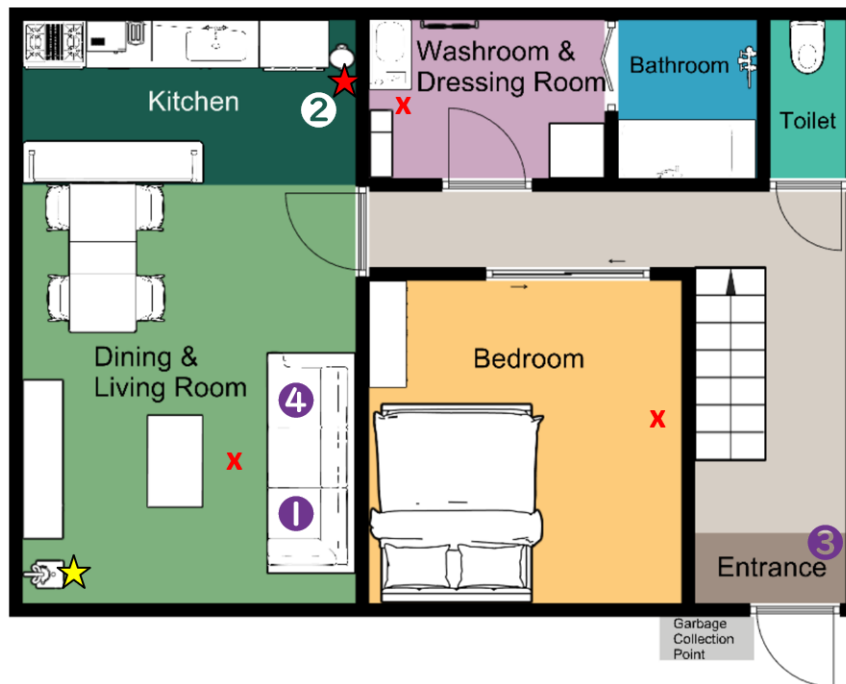
Technical elements:

- | | |
|--|--|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time | ■ Standing up from a chair/ sitting down |
| ■ Working with both hands | ■ Walking with a load |
| ■ Climbing up and down the steps | |

Task6 「Cleaning」

Reference Time
8 minutes

①Dining&Living Room→②Kitchen→
③Entrance→④Dining&Living Room



Task 6 - Cleaning

Description of the Task:

Start by sitting on the couch in the living room. Put the robot on and use the vacuum cleaner (marked with a yellow star) placed in the living room to suck up trash in three places (red X). After sucking up the trashes, dump the trashes from inside the vacuum cleaner into the kitchen trash can (marked with a red star) and take the trash bag out of the trash can and tie it. Set a new trash bag in the trash can. Return the vacuum cleaner to its original place. Take the trash (about 4kg) and leave the front door with the steps (about 20cm) and take the trash out to the dumpster (next to the front door). Then return to the living room. Close the living room door after you enter the living room and sit on the couch to complete the Task.

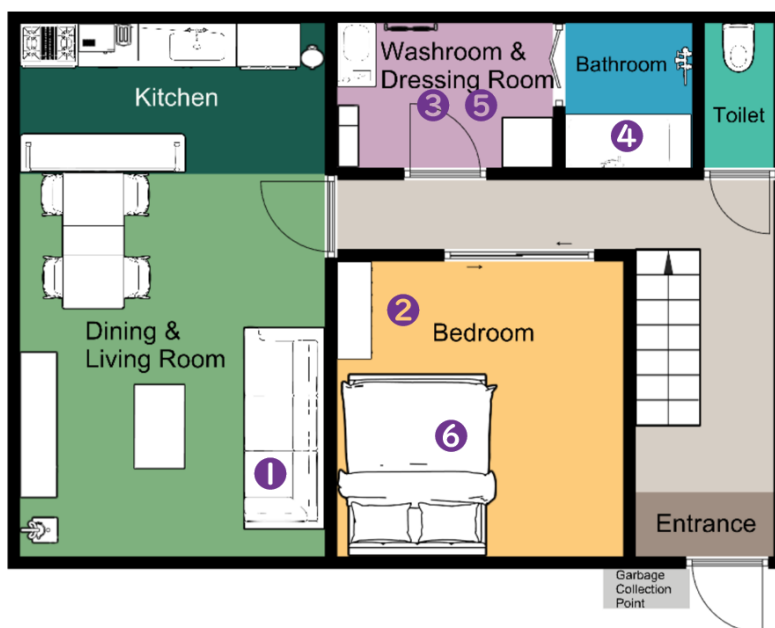
Technical elements:

- | | |
|--|--|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time | ■ Standing up from a chair/ sitting down |
| ■ Working with both hands | ■ Work in a low position |
| ■ Transportation of goods | ■ Climbing up and down the steps |

Task7 「Bathing」

Reference Time
20 minutes

① Dining&Living Room → ② Bedroom → ③ Washroom&Dressing Room →
④ Bathroom → ⑤ Washroom&Dressing Room → ⑥ Bedroom



Task 7 - Bathing

Description of the Task:

Start by sitting on the couch in the living room. Put the robot on and go to the bedroom and take your pyjamas out of the wardrobe. Take your pyjamas and head to the washroom. Once in the washroom, close the door and take a towel from the rack. Take off your clothes and put your clothes in the laundry basket. Then go into the bath area. Take a shower and immerse yourself up to your shoulders in the hot water of the tub. At the prescribed time, get out of the tub/bathroom. Move to the dressing room and wipe yourself down with a towel and put on your pyjamas. Dry your hair with the hairdryer and then head to your bedroom. Sit on the bed, take off the robot, and lie down to complete the Task.

Technical elements:

- | | |
|--|--|
| ■ Practical uptime/weight/durability | ■ Practical walking speed |
| ■ Walking and changing direction in a narrow space | ■ Opening and closing the door |
| ■ Putting on/removing the robot in a short time | ■ Working with both hands (using the shower) |
| ■ Climbing up and down the steps | ■ Stepping over the bathtub |
| ■ Standing/sitting in the bathtub | ■ Water resistance |

