



Global Innovation Challenge 2021

Living Assistance Robot Award

Application Guidelines

1st edition

September 1, 2020

Global Innovation Challenge Executive Committee

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# I Introduction.

## I.1 Introduction.

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

Contact : [inquiry@global-innovation-challenge.com](mailto:inquiry@global-innovation-challenge.com)  
Official Website : <https://global-innovation-challenge.com/>

## I.2 Update history

Last Updated.	version
2020/9/1	1st ed.

## 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.

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 better suits them. In our research, the Global Innovation Challenge Executive Committee have heard from some paraplegics who wish to be able to "walk with independence".

In light of 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. The challenge of "independent walking" using residual functions
2. Providing available options in daily life

To achieve and accelerate this, we will continue to hold the "Global Innovation Challenge Living Assistance Robot Awards" 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 by moving his or her legs without the assistance of others or without using a wheelchair.

### 2.2 Organizer

The Global Innovation Challenge Executive Committee (hereinafter referred to as the "Organizer") was 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

All schedules in this document are based on Japan Standard Time (JST, UTC+9).

- Entry period: September 1, 2020 – February 28, 2021
- Selection period: December 1, 2020 – June 30, 2021
- Publication of results: July 1, 2021
- Awards Ceremony: September 5, 2021 (planned)

## 2.4 Award Ceremony Venue

GIC Tsukuba Innovation Center (former Sugama Elementary School)

877 Nakasugama, Tsukuba-shi, Ibaraki 300-4242, Japan

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

## 2.5 Criterion for Selection

Seven tasks (see Section 4.1 "Criterion for Selection" and Appendix 2 "Achievement of the Task") will be set up based on activities of daily life. Teams that enter this award and pass the documentary selection process, as well as the teams that enter based on the sponsor's original research, will be nominated for the award.

The Organizer will verify the functionality of the candidate robots through document screening, interviews, and on-site surveys, and select the candidates who can accomplish each one of the seven tasks as the winning team.

## 2.6 Fees and Entry Costs

There is no charge for entry to this award. Reasonable costs of transportation, lodging, meals and demonstrations for the winning organization or team to attend the Awards Ceremony will be covered by the Organizer.

# 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 organizations researching and developing robots are eligible for this award. More than one organization may join together to enter this award as a team.
- 3.1.2 There is no restriction on the nationality of team members. However, due to conflicts, epidemics, etc., the Organizer might not be able to conduct a site survey of the team.
- 3.1.3 Team members must not belong to organized criminal groups, such as gangs or terrorist groups.

## 3.2 Target Robot

- 3.2.1 The 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 autonomous walking of a paraplegic person without the assistance of others.
- 3.2.2 Eligible robots are those that can be used by quadriplegics or paraplegics due to spinal cord injury or other causes. For the purposes of this award, a person with paraplegia is defined as being A-B on the ASIA Impairment Scale (AIS) or equivalent to A-B on the Frankel Classification. Any upper limb impairment is not required.
- 3.2.3 There are no restrictions on the shape, weight, size, etc. of the robot as long as it can be used in a general housing environment. Please refer to "Appendix I. Drawings for Temporary Housing" for more information on general housing environment standards.
- 3.2.4 A robot used in contact with a paraplegic is eligible for this award. Movement of the robot alone is not allowed.
- 3.2.5 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.
- 3.2.6 The number of robots used is limited to one for all tasks entered.
- 3.2.7 Robots that are difficult to use in real life, for example those that are excessively noisy, are not eligible for selection.
- 3.2.8 There is no limit to the cost of building a robot.

3.2.9 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 review.

### **3.3 Entry to Selection Process**

#### **3.3.1 Entry**

Please download and fill out the entry sheet from the official website of the Award within the stipulated entry period and submit your entry via the official website.

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

#### **3.3.2 Paperwork and fieldwork**

The Organizer will screen the documents based on the entry sheets submitted by the teams.

The Organizer will also visit the teams as needed and conduct a field survey in the teams' usual testing environment. During the fieldwork, the teams will demonstrate whether the robot can solve a technical problem (see Appendix 2: Achievement of the Task) and whether it can perform a series of actions as part of the Task.

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

#### **3.3.3 Award Notification**

The Organizer will notify the teams that have developed robots that meet the criteria.

Award notification date: July 1, 2021

## **4 Selection**

### **4.1 Criterion for Selection**

#### **4.1.1 Tasks**

The selection criteria for this award includes whether a paraplegic person can accomplish the tasks of daily life in a typical Japanese house. 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 - Using toilet  
Move to the bathroom, use the W.C. and wash hands.
- Task 2 - Preparation  
Wash your face after you get dressed.

- Task 3 – Eating meals  
Place a prepared meal on the table and sit down to eat.
- Task 4 – Laundry  
Wash laundry, take laundry from the line, fold clothes and put them into the wardrobe.
- Task 5 – Receiving deliveries  
Receive a delivered package, unwrap it and place the contents in the refrigerator.
- Task 6 – Cleaning  
Clean the inside of the house with a vacuum cleaner and take the trash bags out of the house.
- Task 7 – Bathing  
Move to the bathroom with your clothes on, change and take a hot bath in the tub.

#### 4.1.2 Task Groups

The subject matter for this award is divided into three Task Groups.

1. Task group 1 includes three tasks: Task 1 "Using toilet", Task 2 "Preparation", Task 3 "Eating meals".
2. Task group 2 includes three tasks: Task 4 "Laundry", Task 5 "Receiving deliveries", Task 6 "Cleaning".
3. Task Group 3 consists of Task 7 "Bathing".

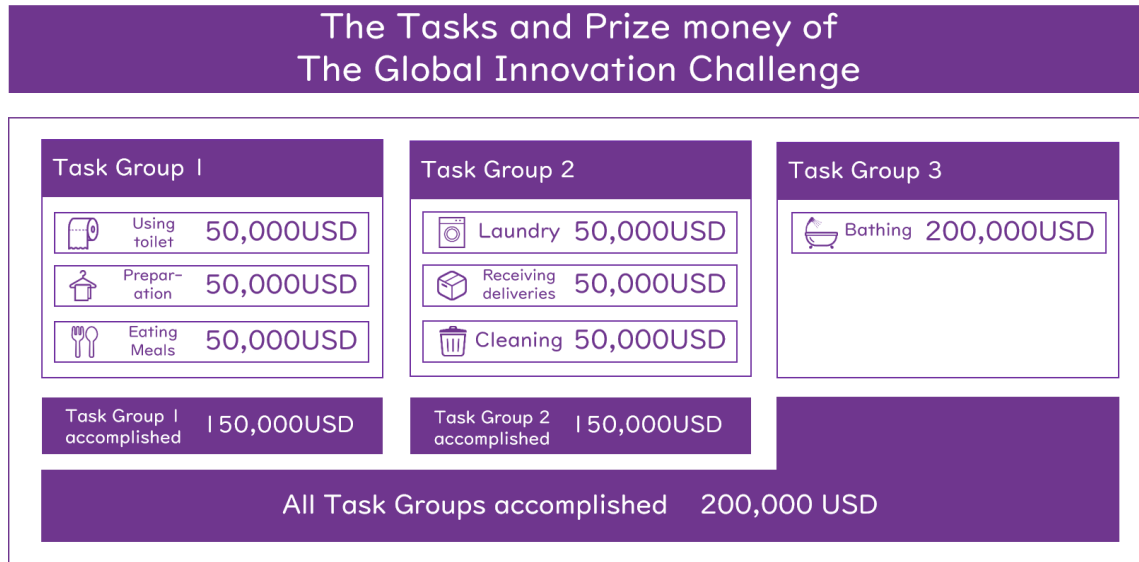
#### 4.1.3 Notes on Tasks

1. Teams can enter any Task or multiple Tasks.
2. Selection will be made by the Organizer in a manner determined by the Organizer.
3. In the event that a team is found to be misrepresenting information or engaging in any other fraudulent activity that the Organizer deems inappropriate, the Organizer may not allow the team to complete the task.



## 4.2 Prize distribution

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



THE TOTAL AMOUNT OF PRIZE 1,000,000 USD

<Figure 1: Global Innovation Challenge challenges and their prizes>

### 4.2.1 Prize money for each challenge

The prize money for each Task is as follows

- Task 1 – Using toilet 50,000 USD
- Task 2 – Preparation 50,000 USD
- Task 3 – Eating meals 50,000 USD
- Task 4 – Laundry 50,000 USD
- Task 5 – Receiving deliveries 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 first team to complete all the Tasks in a group of Tasks defined in "4.1.2 Task Groups" in the same session will receive a prize for each Task plus a prize for the task group. The prize money for each assignment 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 In the event that 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 assignments or assignment 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 Sponsor deems inappropriate, the Sponsor reserves the right to cancel the Award.

## 5 Award Ceremony

### 5.2 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 a demonstration by the winning team. The demonstration will be held in a temporary house 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 Organizer will not use the confidential information on robotics and other technologies obtained during the judging process for any purpose other than the judging process. The submitted confidential information will be stored in strict confidence for a certain period of time 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, was already in the possession of the Organizer prior to the judging process, was legally obtained from a third party without any obligation of confidentiality, or has been mutually confirmed as exceptional information by the Organizer and the owner of the information. The Organizer may also disclose confidential information to the extent necessary to comply with the law or a court order or order of a court, regulatory authority or other public body with the authority to regulate the Organizer. In the event of such a disclosure, the Organizer will contact the subject team in advance (or,

if unavoidable, afterwards).

## **6.2 Photography**

The Organizer 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, promoting technological development and commercialization in the field of Living Assistance robots, etc. In addition, the sponsor 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 Indemnification for Damages**

The Organizer 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 risk. To the extent permitted by applicable law, the Organizer will not be liable for any other damages incurred by the team or its officials as a result of the team's participation in the Award. In addition, the Team and its officials will be liable for all damages caused to the Sponsor 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 Organizer to interview the team, they will try to get the team's permission before they do so.

## **6.5 Cancellation of the Award**

The Organizer may cancel or reschedule the Award if the Organizer determines that the Award cannot be held due to an accident involving the Organizer, 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 Organizer cannot be held liable for any damages caused to entrants or other third parties as a result of the Award's cancellation.

## **6.6 Revised Application Guidelines**

The Sponsor 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**

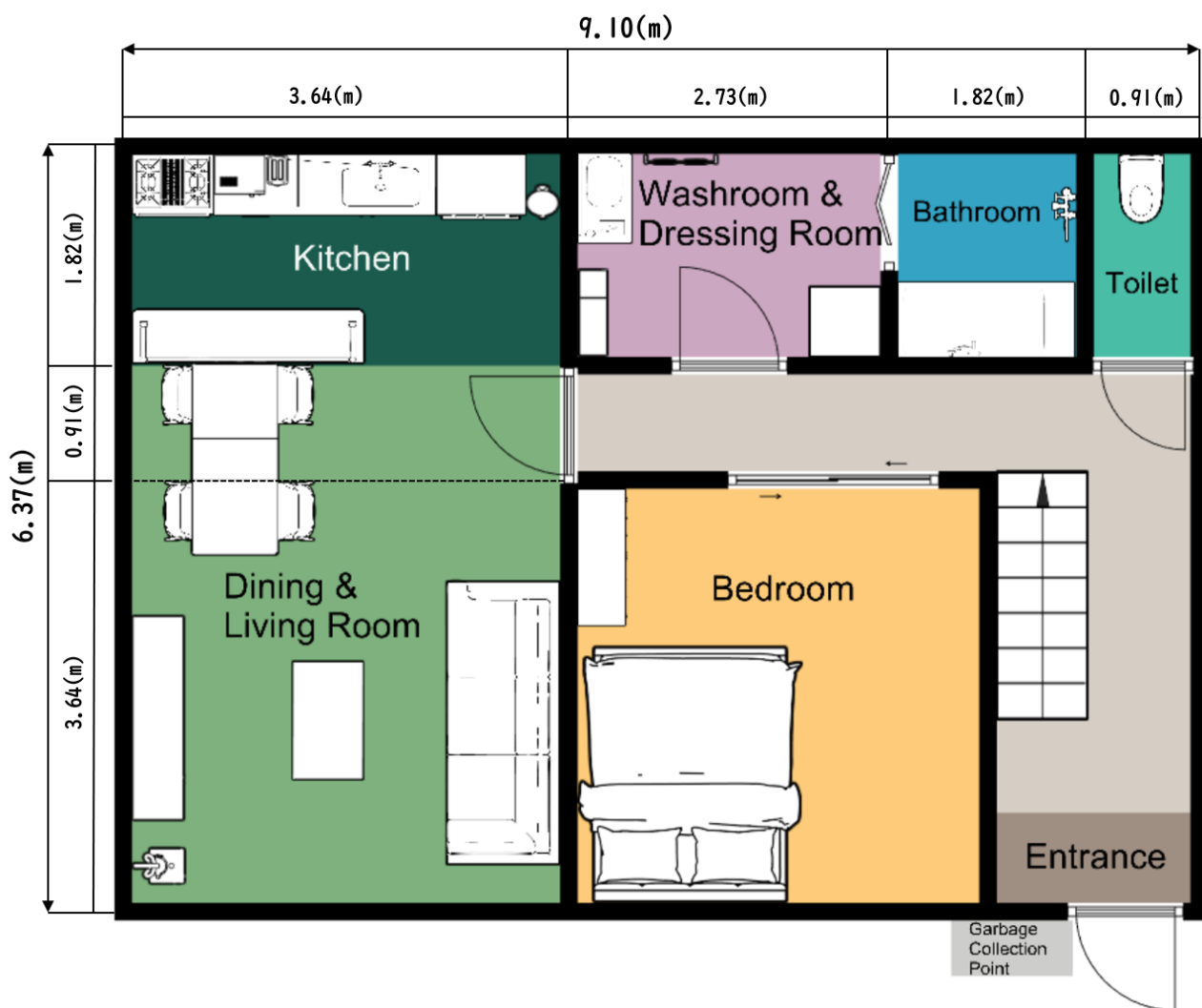
The laws of Japan shall apply to the rights and obligations in relation to the Terms and Conditions and the Award, and all disputes in relation to the Terms and Conditions and the Award shall be subject to the exclusive jurisdiction of the Tokyo District Court as the court of first instance.

# Appendix

## I. Drawings for Temporary Housing

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

The house layouts, lifestyles and behaviors described here are based on basic Japanese housing and customs.



<Figure 2: Temporary housing at the GIC Tsukuba Innovation Center



<Figure 3: 3D drawing of temporary housing

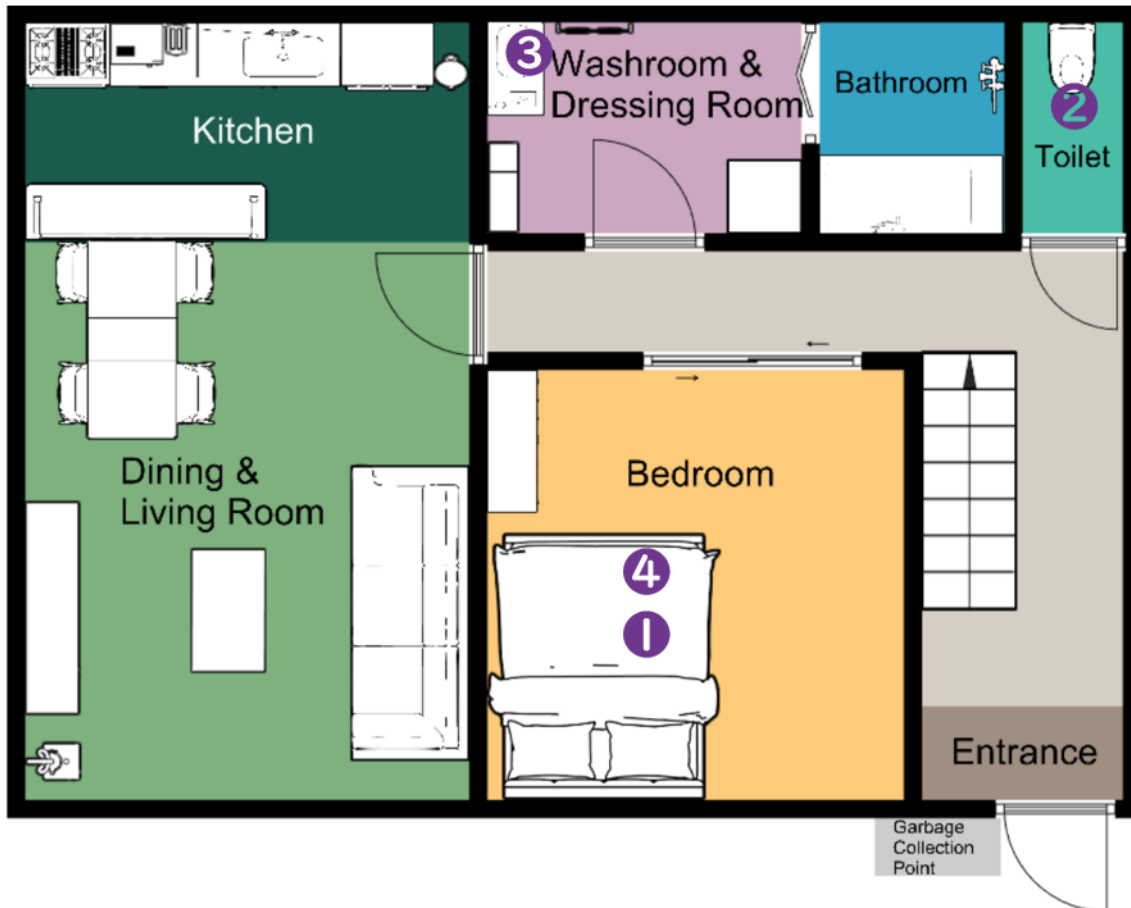
## 2. Achievement of the Task

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 or not the main movement elements of the task can be accomplished, taking into account the totality of the task.

# Task 「Using toilet」

Reference Time  
5 minutes

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



## Description:

Start in bed in your pajamas. 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 pants and sit on the toilet seat. Then get up from the toilet seat and raise your pants. Pull the flush lever. Exit the toilet and close the door. Move to the bathroom and wash your hands with the towel hanging in the bathroom. Move to the bedroom and sit on the bed to complete the task.

## Technical Issues:

Practical uptime/weight/durability

Walking and changing direction in a narrow space

Putting on/removing the robot in a short time

Practical walking speed

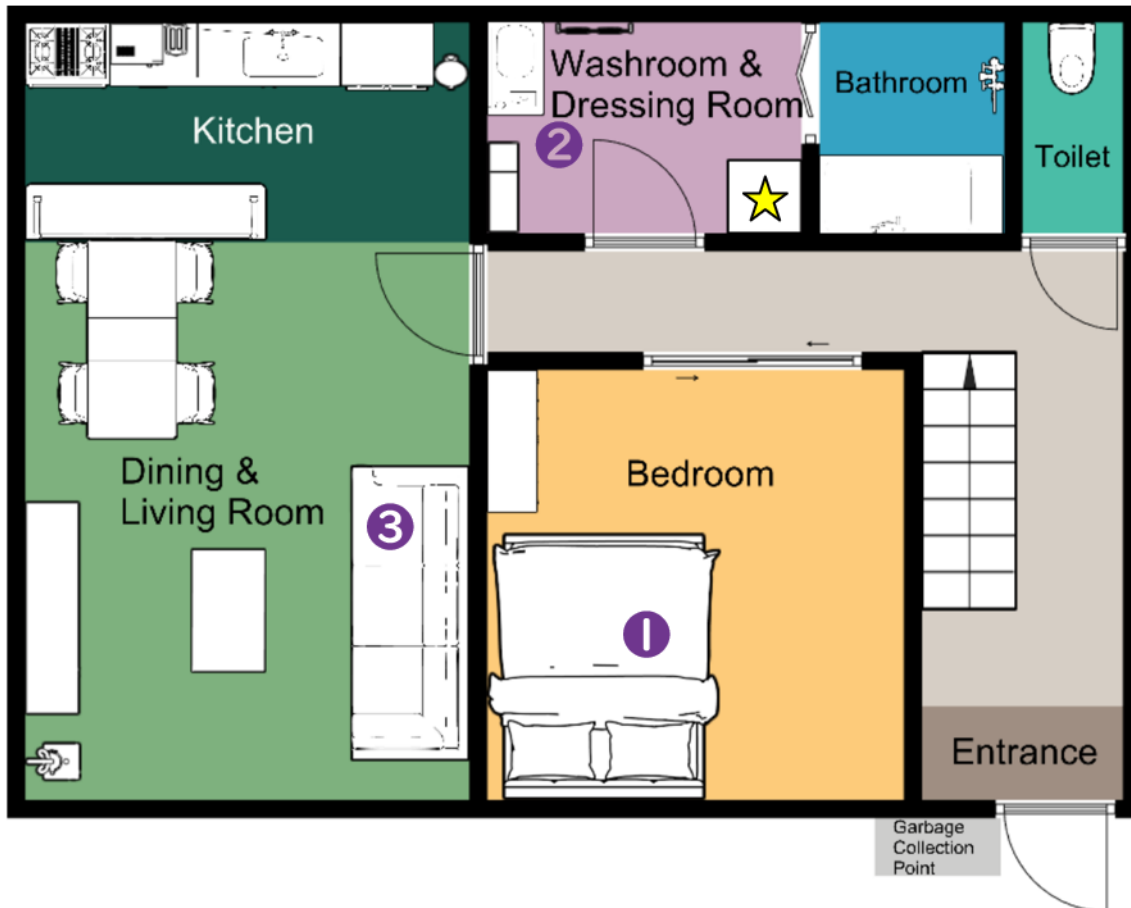
Opening and closing the door

Standing up from a chair/ sitting down

## Task2 「Preparation」

Reference Time  
6 minutes

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



### Description:

Start from a sitting position on the bed. Attach the robot and move to the washroom. 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 Issues:

Practical uptime/weight/durability

Walking and changing direction in a narrow space

Putting on/removing the robot in a short time

Working with both hands

Practical walking speed

Opening and closing the door

Take a seat.

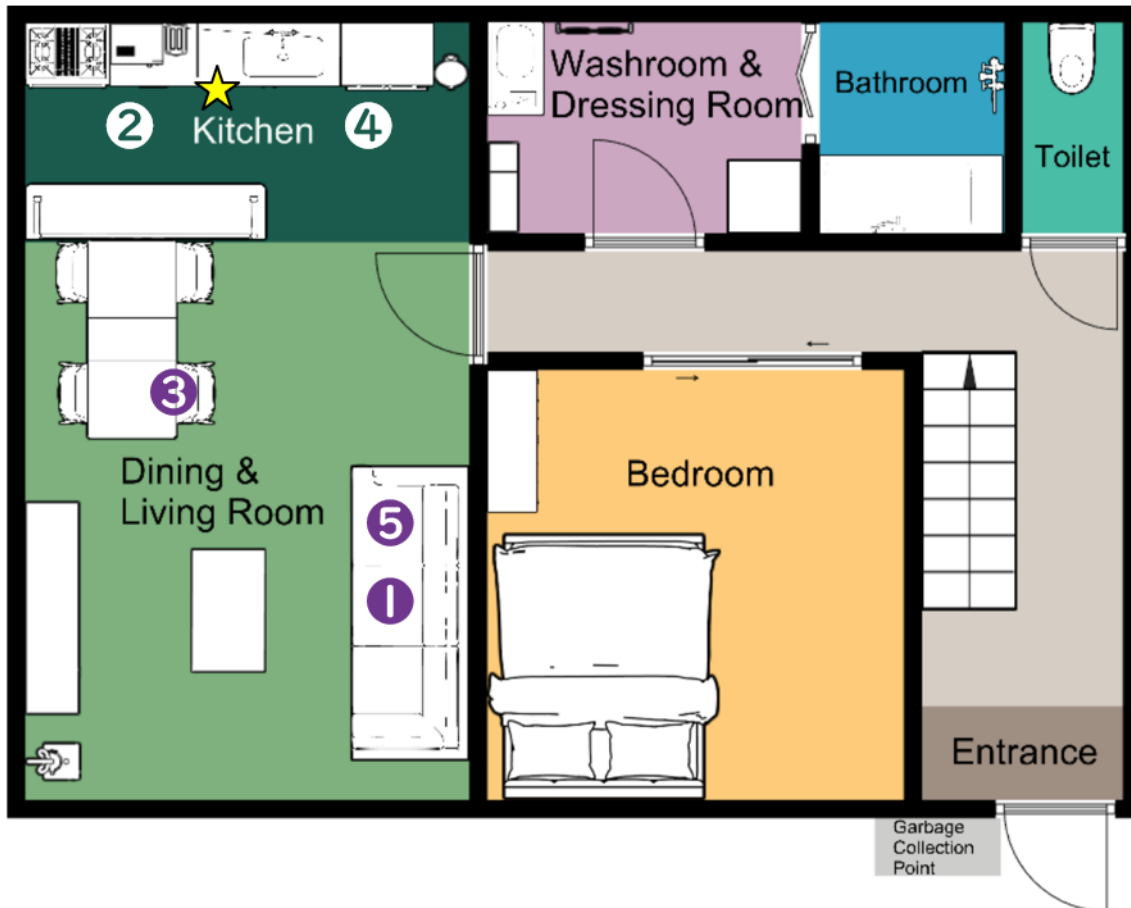
Forward leaning posture



### Task3 「Eating meals」

Reference Time  
6 minutes

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



#### Description:

Start by sitting on the living room couch. Attach the robot and move to the kitchen. (1) Start toasting bread in the toaster, (2) transfer food from one pan to a plate, and (3) serve soup from another pan. (4) Remove a drink from the refrigerator and pour it into a cup. 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, clasp your hands together and chant, "Itadakimasu." Clasp your hands together to say, "Thank you for the 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 Issues:

Practical uptime/weight/durability

Practical walking speed

Walking and changing direction in a narrow space

Putting on/removing the robot in a short time

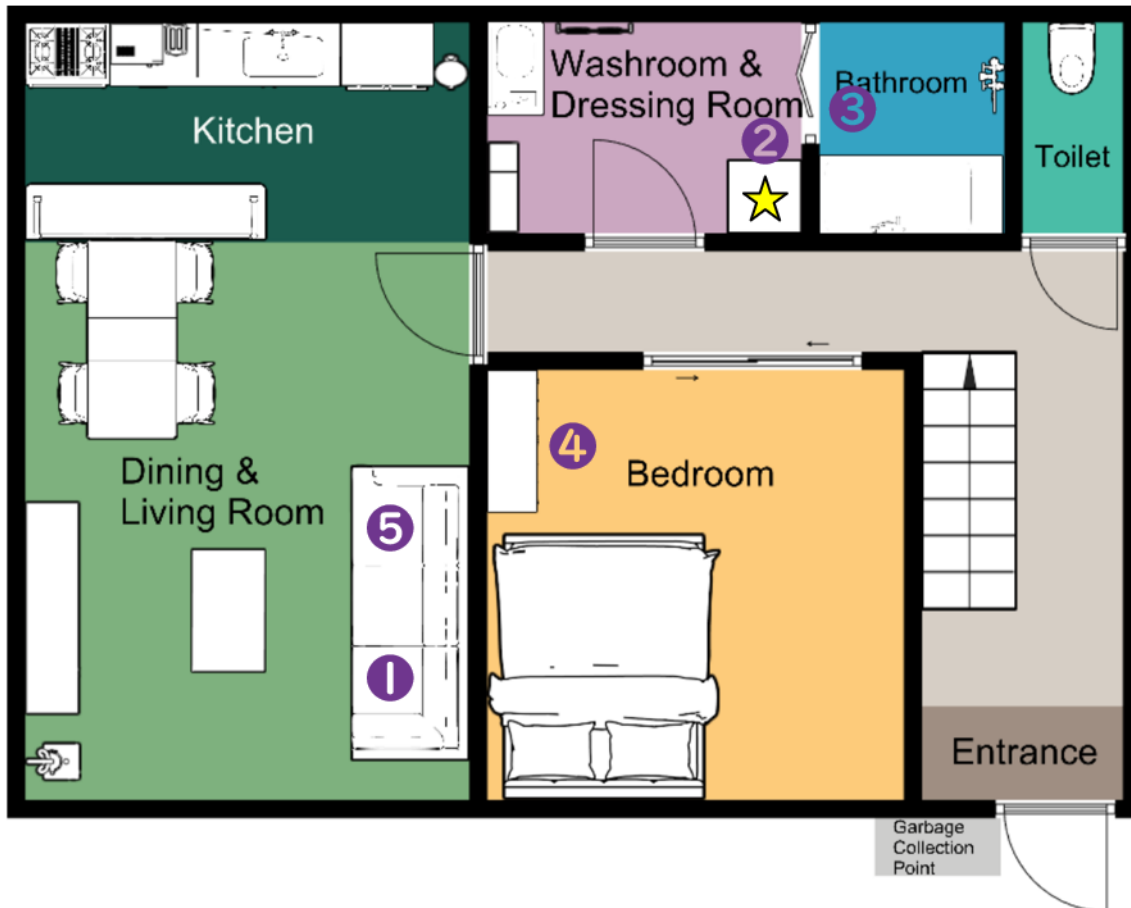
Standing up from a chair/ sitting down  
Walking with food

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



### Description:

Start from a sitting position on the living room couch. Attach the robot 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 when you enter the living room. Sit on the living room couch to complete the task.

### Technical Issues:

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

Walking with a load

Standing up from a chair/ sitting down

Work in a low/forward leaning position

## Task5 「Receiving deliveries」

Reference Time  
5 minutes

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



### Description:

Start sitting on the couch in the living room. Attach the robot 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 a step (about 20 cm) and receive your package (a cardboard box of about 1.5 kg, 32 cm x 25 cm x 11 cm). Take the package and move to the kitchen, open the package and put its contents in the refrigerator. Fold the cardboard box and place it in the kitchen at the garbage can (marked with a red star). Close the living room door and sit on the couch to complete the task.

### Technical Issues:

Practical uptime/weight/durability

Walking and changing direction in a narrow space

Putting on/removing the robot in a short time

Working with both hands

Practical walking speed

Opening and closing the door

Standing up from a chair/ sitting down

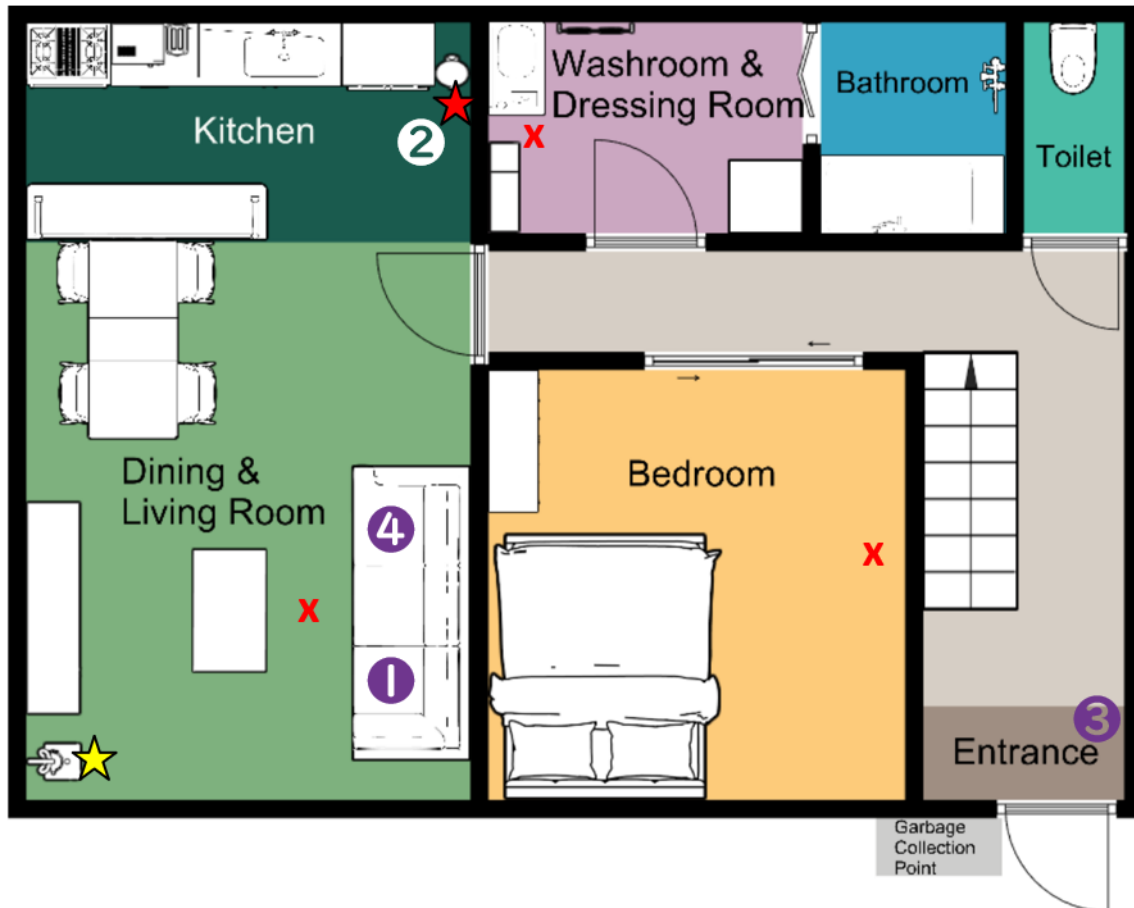
Walking with a load

Climbing steps

## Task6 「Cleaning」

Reference Time  
8 minutes

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



### Description:

Start by sitting on the couch in the living room. Attach the robot and use the vacuum cleaner (marked with a yellow star) placed in the living room to suck up trash in three places (red X). Next, dump the trash from inside the vacuum cleaner into the kitchen trash can (marked with a red star) and tie a trash bag to 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. Then head to the living room. Close the living room door and sit on the couch to complete the task.

### Technical Issues:

Practical uptime/weight/durability

Walking and changing direction in a narrow space

Putting on/removing the robot in a short time

Practical walking speed

Opening and closing the door

Standing up from a chair/ sitting down

Working with both hands  
Transportation of goods

Work from a low position  
Climbing 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



### Description:

Start by sitting on the couch in the living room. Put the robot on and go to the bedroom and take your pajamas out of the wardrobe. Take your pajamas and head to the bathroom. Once in the bathroom, 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, wipe yourself with a towel and put on your pajamas. Dry your hair with the hairdryer and then head to your bedroom. Sit on the bed, remove the robot and lie down, to complete the task.

### Technical Issues:

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

Climbing steps

Standing/Sitting in the bathtub

Working with both hands (using the shower)

Stepping over the bathtub

Water resistance

