Skill Dictionary

Communication and Explainability

1. **StreamRobotView** **25**
Description: Stream the robot's view to the arena screen using VizBox

2. **StreamRobotMic** **25**
Description: Stream the robot microphone (transmit direct audio perception)

3. **StreamRobotVoice** **25**
Description: Stream the robot's voice and filter it out in audio perception

4. **DisplayRecogObjects** **25**
Description: Display ROIs for recognized objects

5. **DisplayExecSubtask** **20**
Description: Display currently executed subtask/skill

6. **DisplayRobotPosPath** **20**
Description: Display robot position estimation, navigation goal, and planned path

7. **DisplaySTTResults** **25**
Description: Display Speech-to-Text result as subtitle file in video

Safe Interactions

8. **StopOnTrigger** **50**
Description: On defined trigger (e.g. shouting 'Stop' or touching the robot's arm): Immediately stop the current action

9. **ContinueOnTrigger** **50**
Description: On defined trigger (e.g. saying 'Continue' or pressing the robot finger): Continue with the interrupted action

Perception

10. **RecogKnownObj** **5**
Description: Recognize a known object or person in an image or other sensor data

11. **RecogUnknownObjClass** **15**
Description: Recognize the class of an unknown object in an image

12. **Recog3DPoseKnownObj** **10**
Description: Recognize 3D pose of a known static object

13. **Recog3DPoseUnknownObj** **30**
Description: Recognize 3D pose of an unknown static object

14. **RecogPointingTarget** **15**
Description: Recognize the target object a human is pointing at

15. **DetectPlacementSurface** **10**
Description: Detect a surface suitable for placing an entity

16. **FindSimilarObjects** **20**
Description: Find the most similar objects given a reference object

17. **DetectAbsenceObjClass**   **10**
    Description: Detect absence of an object class in the environment

18. **DescribePersonOrObject**   **15**
    Description: Describe a person or an object based on visually perceived features (e.g., height, age-range, clothes, hair color and length)

19. **DetectHumanPoseAction**   **10**
    Description: Detect a human pose or an action (e.g., waving, calling)

20. **LookAtInterestingPerson**   **10**
    Description: Look at the face of the interesting person

21. **LookAtTalkingPerson**   **10**
    Description: Look at the person that is talking to the robot (sound source localization)

22. **DetectStoppedConv**   **5**
    Description: Detect that a conversation (between at least two humans) has stopped

Dialog

23. **UnderstandNonExpertCmds**   **15**
    Description: Understand commands from non-expert operators (understand synonym sentences)

24. **GenerateDialogLog**   **15**
    Description: Generate a dialog log of a task

25. **SummarizeDialogEvents**   **15**
    Description: Summarize the dialog and generally what happened in a task

26. **BehaveFriendlyLikable**   **5**
    Description: Always be pleasant to the person you are talking to

27. **DescribeStoredPersonOrObject**   **5**
    Description: Describe a person or an object using the stored information

Knowledge

28. **SaveLocationRequest**   **10**
    Description: Save the location of an object or person upon request

29. **SaveReRecogPersonFace**   **10**
    Description: Save and re-recognize a person's face

30. **SaveReRecogPersonVoice**   **10**
    Description: Save and re-recognize a person's voice

31. **SaveSpeakerInfo**   **15**
    Description: Save provided information about a speaker (e.g., name, preferences, object ownership, order)

Navigation

32. **NavigateToTarget** **5**
Description: Navigate to a specified target location

33. **TrackFollowPerson** **10**
Description: Detect, track and follow a person

34. **AvoidNavigationObstacle** **5**
Description: Avoid an object in the navigation path

35. **AvoidSmallObstacle** **10**
Description: Avoid a small object in the navigation path

36. **AvoidHardToSeeObstacle** **10**
Description: Avoid a hard-to-see object in the navigation path

37. **AvoidMarkedAreas** **5**
Description: Avoid predefined marked areas during navigation

38. **AvoidPersonCrowd** **10**
Description: Avoid a person or a crowd of people obscuring the path

39. **TransportWithTray** **30**
Description: Use an unattached carried tray to transport items

Manipulation

40. **PickTinyKnown** **60**
Description: Pick up a tiny known object

41. **PickNormalKnown** **40**
Description: Pick up a normal-sized (hardy) known object

42. **PickLargeKnown** **30**
Description: Pick up a large known object

43. **PickHeavyKnown** **45**
Description: Pick up a heavy known object

44. **PickTinyUnknown** **75**
Description: Pick up a tiny unknown object

45. **PickNormalUnknown** **55**
Description: Pick up a normal-sized (hardy) unknown object

46. **PickLargeUnknown** **45**
Description: Pick up a large unknown object

47. **PickHeavyUnknown** **60**
Description: Pick up a heavy unknown object

48. **PickFabric** **40**
Description: Pick up fabric or cloth

49. **PlaceTinyKnown** **20**
Description: Place a tiny known object

50. **PlaceNormalKnown** **15**
Description: Place a normal-sized (hardy) known object

51. **PlaceLargeKnown** **15**
Description: Place a large known object

52. **PlaceHeavyKnown** **20**
Description: Place a heavy known object

53. **PlaceTinyUnknown** **25**
Description: Place a tiny unknown object

54. **PlaceNormalUnknown** **25**
Description: Place a normal-sized (hardy) unknown object

55. **PlaceLargeUnknown** **25**
Description: Place a large unknown object

56. **PlaceHeavyUnknown** **30**
Description: Place a heavy unknown object

57. **PlaceFabricContainer** **25**
Description: Place fabric into a container (or into a washing machine/dryer)

58. **PourIntoContainer** **40**
Description: Pour something into a container

59. **PlaceTinyObjectInContainer** **40**
Description: Place a tiny object into a small sized container

60. **ReceiveObjectHandover** **5**
Description: Receive an object by a human hand over

61. **PassObjectHandback** **5**
Description: Pass an object to a human hand back

62. **OperateSimpleMechanism** **20**
Description: Operate a simple mechanism (e.g., press a button, pull a lever)

Furniture Actions

63. **OpenEntranceDoor** **20**
Description: Open an entrance door

64. **CloseEntranceDoor** **30**
Description: Close an entrance door

65. **OpenShelfDoor** **45**
Description: Open a shelf door

66. **CloseShelfDoor** **20**
Description: Close a shelf door

67. **PullOutRack** **45**
Description: Pulling out a rack

68. **PushInRack** **20**
Description: Pushing in a rack

| 69. | **OpenDishwasherDoor** | **60** |
| | Description: Open dishwasher door | |

| 70. | **CloseDishwasherDoor** | **80** |
| | Description: Close dishwasher door | |

| 71. | **OpenWashingMachineDoor** | **50** |
| | Description: Open a washing machine door | |

| 72. | **CloseWashingMachineDoor** | **80** |
| | Description: Close a washing machine door | |

| 73. | **StartWashingMachine** | **20** |
| | Description: Start a washing machine | |

Using Tools

| 74. | **PushLightSwitch** | **10** |
| | Description: Pushing a light switch | |

| 75. | **PushButton** | **10** |
| | Description: Pushing a small button (e.g., on a washing machine) | |

| 76. | **StartElectricKettle** | **10** |
| | Description: Starting an electric kettle | |

| 77. | **DustSurfaces** | **60** |
| | Description: Dusting surfaces | |

| 78. | **WipeTableSurface** | **60** |
| | Description: Wiping the table surface | |

Penalty

| 79. | **PenaltyCallHumanHelp** | **-20** |
| | Description: Penalty for calling a human to help with the task | |

| 80. | **PenaltyBypassSpeechRec** | **-40** |
| | Description: Penalty for bypassing speech recognition | |

| 81. | **PenaltyDropObject** | **-20** |
| | Description: Penalty for dropping an object | |

| 82. | **PenaltyDamageObject** | **-50** |
| | Description: Penalty for damaging an object | |

| 83. | **PenaltyDangerousPosition** | **-30** |
| | Description: Penalty for leaving an object in a dangerous position | |

| 84. | **PenaltySpillWhilePouring** | **-20** |
| | Description: Penalty for spilling substance while pouring | |

| 85. | **PenaltyNotDetectPerson** | **-20** |
| | Description: Penalty for not detecting a person (no awareness) | |

| 86. | **PenaltyNotRecognizePerson** | **-10** |
| | Description: Penalty for not recognizing a person (unable to retrieve associated, stored information) | |

87. **PenaltyBypassManipulation** **-10**
Description: Penalty for bypassing manipulation, but succeeding with the perception (and macro planning, so telling what should be done)

88. **PenaltyMisunderstandContext** **-10**
Description: Penalty for misunderstanding the context

89. **PenaltyUnfriendlyBehavior** **-30**
Description: Penalty for behaving unfriendly or not attending to interaction partner

90. **PenaltyTouchHuman** **-25**
Description: Penalty for touching a human

91. **PenaltyCollideStatic** **-40**
Description: Penalty for colliding with a static obstacle

92. **PenaltyCollideDynamic** **-30**
Description: Penalty for colliding with a dynamic obstacle

93. **PenaltyLeaveArea** **-50**
Description: Penalty for leaving the designated area

94. **PenaltyIncorrectTask** **-25**
Description: Penalty for incorrect task execution

1 VizBox usage

Group (G-1)   **Type:** Sequential   **Bonus:** 25
Stream basic perception to the VizBox interface

1	Stream the robot's view to the arena screen using VizBox	25
2	Stream the robot microphone (transmit direct audio perception)	25
3	Stream the robot's voice and filter it out in audio perception	25

Group (G-2)   **Type:** Sequential   **Bonus:** 75
Stream general extracted knowledge to the VizBox interface

4	Display ROIs for recognized objects	25
5	Display currently executed subtask/skill	20
6	Display robot position estimation, navigation goal, and planned path	20
7	Display Speech-to-Text result as subtitle file in video	25

Group (G-3)   **Type:** Sequential   **Bonus:** 75
Always be able to interrupt the action and continue it, without any additional expert interaction

8	On defined trigger (e.g. shouting 'Stop' or touching the robot's arm): Immediately stop the current action	50
9	On defined trigger (e.g. saying 'Continue' or pressing the robot finger): Continue with the interrupted action	50

2 Carry my Luggage

Group (G-4)   **Type:** Selection   **Bonus:** 40
Handle obstacles such as avoiding objects, marked areas, and people during navigation

34	Avoid an object in the navigation path	5
35	Avoid a small object in the navigation path	10
36	Avoid a hard-to-see object in the navigation path	10
37	Avoid predefined marked areas during navigation	5
38	Avoid a person or a crowd of people obscuring the path	10

Group (G-5)   **Type:** Selection   **Bonus:** 20
Obtain information about the target bag, either by saving provided information or recognizing the target object

31	Save provided information about a speaker (e.g., name, preferences, object ownership, order)	15
14	Recognize the target object a human is pointing at	15

Group (G-6)   **Type:** Sequential   **Bonus:** 20
Navigate to the bag, recognize its 3D pose and pick it up

32	Navigate to a specified target location	5
13	Recognize 3D pose of an unknown static object	30
46	Pick up a large unknown object	45

Group (G-7)   **Type:** Sequential   **Bonus:** 20
Follow a person while handling obstacles

33	Detect, track and follow a person	10
G-4	*Handle obstacles such as avoiding objects, marked areas, and people during navigation*	

Group (G-8)   **Type:** Sequential   **Bonus:** 30
Main Task: Complete the 'Carry My Luggage' task

G-5	*Obtain information about the target bag, either by saving provided information or recognizing the target object*	
G-6	*Navigate to the bag, recognize its 3D pose and pick it up*	
G-7	*Follow a person while handling obstacles*	
32	Navigate to a specified target location	5

Group (G-9)   **Type:** Penalty   **Bonus:** -20
Penalties for various infractions during the task

79	Penalty for calling a human to help with the task	-20
81	Penalty for dropping an object	-20

3 Receptionist

Group (G-10) **Type:** Permanent **Bonus:** 10
Exhibit civilized behaviour like looking at interacting persons and behaving friendly

20	Look at the face of the interesting person	10
21	Look at the person that is talking to the robot (sound source localization)	10
26	Always be pleasant to the person you are talking to	5

Group (G-11) **Type:** Sequential **Bonus:** 20
Welcome the guest by navigating to them and handling doors

32	Navigate to a specified target location	5
63	Open an entrance door	20
64	Close an entrance door	30

Group (G-12) **Type:** Selection **Bonus:** 30
Identify and remember a person either by face or voice

| 29 | Save and re-recognize a person's face (2 times) | 10 |

Group (G-13) **Type:** Sequential **Bonus:** 20
Remember two facts about a person

| 31 | Remember name and preferences | 15 |
| 31 | Remember object ownership and order | 15 |

Group (G-14) **Type:** Sequential **Bonus:** 20
Introduce a person using stored and visually perceived information

| 18 | Discribe a person according to visually perceived features (e.g. height, age-range, cloths, hair-colour and length, gender; at least three features) | 15 |
| 27 | Describe a person or an object using the stored information | 5 |

Group (G-15) **Type:** Sequential **Bonus:** 40
Handle the guest by welcoming, remembering facts, navigating, and introducing

G-11	*Welcome the guest by navigating to them and handling doors*	
G-13	*Remember two facts about a person*	
32	Navigate to a specified target location	5
G-14	*Introduce a person using stored and visually perceived information*	

Group (G-16) **Type:** Sequential **Bonus:** 50
Main Task: Complete the Receptionist task by handling guests and introductions

| G-15 | *Handle the guest by welcoming, remembering facts, navigating, and introducing* 2 times | |
| G-14 | *Introduce a person using stored and visually perceived information* Introduce 1. Guest to 2. Guest | |

Group (G-17) **Type:** Penalty **Bonus:** -20
Penalties for failure to detect or recognize persons

| 85 | Penalty for not detecting a person (no awareness) | -20 |
| 86 | Penalty for not recognizing a person (unable to retrieve associated, stored information) | -10 |

4 Serve Breakfast

Group (G-18)   **Type:** Selection   **Bonus:** 30
Pick up different breakfast items

40	Pick up a Spoon (tiny object)	60
41	Pick up a Bowl (normal-sized known)	40
42	Pick up a Cereals (large object)	30
43	Pick up a Milk (heavy object)	45

Group (G-19)   **Type:** Selection   **Bonus:** 30
Place breakfast items appropriately

49	Place Spoon next to the bowl	20
50	Place Bowl on the table	15
51	Put Cereals in the bowl	15
52	Place Milk on the table	20

Group (G-20)   **Type:** Sequential   **Bonus:** 40
Set up each breakfast item at the target location

32	Navigate to a specified target location	5
G-18	*Pick up different breakfast items*	
32	Navigate to a specified target location	5
G-19	*Place breakfast items appropriately*	

Group (G-21)   **Type:** Sequential   **Bonus:** 50
Prepare the table for breakfast, including setting up all breakfast items

G-20	*Set up each breakfast item at the target location* (4 times)	

Group (G-22)   **Type:** Sequential   **Bonus:** 60
Main Task: Serve breakfast

G-21	*Prepare the table for breakfast, including setting up all breakfast items*	
58	Cereal into the bowl	40

Group (G-23)   **Type:** Sequential   **Bonus:** 70
Complete the full goal of the task, including all main and additional objectives

G-22	*Main Task: Serve breakfast*	
12	Placing the spoor next to the bowl	10
58	Pour milk into the bowl	40

Group (G-24)   **Type:** Penalty   **Bonus:** -20
Penalties for various infractions during the task

79	Penalty for calling a human to help with the task	-20
81	Penalty for dropping an object	-20
84	Penalty for spilling substance while pouring	-20

5 Storing Groceries

Group (G-25)   **Type:** Selection   **Bonus:** 30
Pick up various grocery items

40	Pick up a tiny known object	60
41	Pick up a normal-sized (hardy) known object	40
42	Pick up a large known object	30
43	Pick up a heavy known object	45

Group (G-26)   **Type:** Selection   **Bonus:** 30
Place grocery items appropriately

49	Place a tiny known object	20
50	Place a normal-sized (hardy) known object	15
51	Place a large known object	15
52	Place a heavy known object	20

Group (G-27)   **Type:** Sequential   **Bonus:** 40
Store each grocery item at the target location

32	Navigate to a specified target location	5
G-25	*Pick up various grocery items*	
32	Navigate to a specified target location	5
16	Communicate target location	20
G-26	*Place grocery items appropriately*	

Group (G-28)   **Type:** Sequential   **Bonus:** 50
Main Task: Storing groceries, including opening and closing shelves

65	Open a shelf door	45
G-27	*Store each grocery item at the target location*	
66	Close a shelf door	20

Group (G-29)   **Type:** Penalty   **Bonus:** -20
Penalties for various infractions during the task

79	Penalty for calling a human to help with the task	-20
81	Penalty for dropping an object	-20
88	Storing an object without categorizing it correctly	-10

6 Clean the table

Group (G-30)   **Type:** Selection   **Bonus:** 30
Pick up various dish items from the table

40	Pick up a Spoon, Fork or a Knife	60
41	Pick up a Bowl or Cup	40
43	Pick up a Plate	45

Group (G-31)   **Type:** Selection   **Bonus:** 30
Place dish items appropriately in the dishwasher

49	Place Spoon, Fork or Knife	20
50	Place Bowl or Cup	15
52	Place Plate	20

Group (G-32)   **Type:** Sequential   **Bonus:** 20
Open and close the dishwasher door

| 69 | Open dishwasher door | 60 |
| 70 | Close dishwasher door | 80 |

Group (G-33)   **Type:** Sequential   **Bonus:** 20
Pull out and push in the dishwasher rack

| 67 | Pulling out a rack | 45 |
| 68 | Pushing in a rack | 20 |

Group (G-34)   **Type:** Sequential   **Bonus:** 10
Handle the detergent powder

| 46 | Pick up detergent powder | 45 |
| 58 | Pouring powder into container | 40 |

Group (G-35)   **Type:** Sequential   **Bonus:** 10
Handle the dishwasher tab

| 44 | Pick up a dishwasher tab | 75 |
| 59 | Place tab in small container | 40 |

Group (G-36)   **Type:** Exclusive   **Bonus:** 10
Handle detergent selection process

| G-34 | *Handle the detergent powder* |
| G-35 | *Handle the dishwasher tab* |

Group (G-37) **Type:** Sequential **Bonus:** 20
Put items into the dishwasher

32	Navigate to a specified target location	5
G-30	*Pick up various dish items from the table*	
32	Navigate to a specified target location	5
16	Find the most similar objects given a reference object	20
G-31	*Place dish items appropriately in the dishwasher*	

Group (G-38) **Type:** Sequential **Bonus:** 30
Main Task: Clean the Table

| **G-37** | *Put items into the dishwasher* (6 times/items. You are allowed to carry multiple items) |

Group (G-39) **Type:** Sequential **Bonus:** 30
Bonus goals of cleaning the table

G-32	*Open and close the dishwasher door*
G-33	*Pull out and push in the dishwasher rack*
G-36	*Handle detergent selection process*

Group (G-40) **Type:** Sequential **Bonus:** 200
The complete cleaning the table task

| **G-38** | *Main Task: Clean the Table* |
| **G-39** | *Bonus goals of cleaning the table* |

Group (G-41) **Type:** Penalty **Bonus:** -20
Penalties for various infractions during the task

| 81 | Penalty for dropping an object | -20 |

7 Restaurant

Group (G-42)   **Type:** Selection   **Bonus:** 10
Detect and identify customers entering the restaurant

19	Detecting customer entering	10
10	Recognizing customer's face	5

Group (G-43)   **Type:** Sequential   **Bonus:** 20
Take the customer's order

G-42	*Detect and identify customers entering the restaurant*	
32	Approach customer	5
28	Save the location of an object or person upon request	10
26	Welcome customer	5
23	Understand customer's order	15
31	Save customer's order (2x, Once per customer)	15
25	Summarize orders taken	15

Group (G-44)   **Type:** Sequential   **Bonus:** 30
Collect the ordered items from the kitchen

32	Navigate to kitchen	5
41	Pick up ordered items (2x, Once per customer)	40

Group (G-45)   **Type:** Sequential   **Bonus:** 30
Deliver the order to the customer

32	Navigate to customer's table	5
50	Place order on the table (2x, Once per customer)	15

Group (G-46)   **Type:** Sequential   **Bonus:** 20
Handle an order for a table

G-43	*Take the customer's order*
G-44	*Collect the ordered items from the kitchen*
G-45	*Deliver the order to the customer*

Group (G-47)   **Type:** Selection   **Bonus:** 15
Extra tasks for additional points

26	Always be pleasant to the person you are talking to	5
18	Describe a person for entertainment	15
58	Prepare a drink, by pouring it from the bottle into a glass	40

Group (G-48)   **Type:** Selection   **Bonus:** 15
Special tasks utilizing VizBox

1	Stream robot's view for customers	25
4	Display recognized objects	25
7	Display speech-to-text results	25

Group (G-49)   **Type:** Sequential   **Bonus:** 50
Main Task: Restaurant Servant

G-46	*Handle an order for a table*
G-47	*Extra tasks for additional points*
G-48	*Special tasks utilizing VizBox*

Group (G-50)   **Type:** Sequential   **Bonus:** 20
Clean and set up the table

| 78 | Clean the table surface | 60 |
| 50 | Place tableware | 15 |

Group (G-51)   **Type:** Sequential   **Bonus:** 20
Process guests' payments

| 14 | Recognize payment method pointed by guest | 15 |
| 60 | Receive payment | 5 |

Group (G-52)   **Type:** Selection   **Bonus:** 15
Additional tasks for additional points

| **G-51** | *Process guests' payments* |
| **G-50** | *Clean and set up the table* |

Group (G-53)   **Type:** Selection   **Bonus:** 15
Be a fully functional robot servant

| **G-49** | *Main Task: Restaurant Servant* |
| **G-52** | *Additional tasks for additional points* |

Group (G-54)   **Type:** Penalty   **Bonus:** -20
Penalties for various infractions during the task

89	Penalty for behaving unfriendly or not attending to interaction partner	-30
79	Penalty for calling a human to help with the task	-20
81	Penalty for dropping an object	-20
84	Penalty for spilling substance while pouring	-20
88	Penalty for misunderstanding the context	-10

8   Stickler for the Rules

Group (G-55)   **Type:** Selection   **Bonus:** 10
Detect guests wearing shoes

19	Detect a human pose or an action (e.g., waving, calling)	10
10	Recognize a known object or person in an image or other sensor data	5

Group (G-56)   **Type:** Selection   **Bonus:** 10
Detect guests without a drink

32	Navigate to guest location	5
17	Detect absence of a drink	10

Group (G-57)   **Type:** Selection   **Bonus:** 10
Detect a person in a private room

32	Navigate to room location	5
10	Recognize person in room	5

Group (G-58)   **Type:** Selection   **Bonus:** 10
Detect garbage on the floor

32	Navigate to garbage location	5
10	Recognize garbage	5

Group (G-59)   **Type:** Sequential   **Bonus:** 20
Check for various rule breaks

G-55	*Detect guests wearing shoes*
G-56	*Detect guests without a drink*
G-57	*Detect a person in a private room*
G-58	*Detect garbage on the floor*

Group (G-60)   **Type:** Sequential   **Bonus:** 30
Main Task: Checking for rule breaks

G-59	*Check for various rule breaks* Check multiple times for rule breaks (4 times)

Group (G-61)   **Type:** Penalty   **Bonus:** -20
Penalties for failure to detect or recognize rule breaks

85	Penalty for not detecting a person (no awareness)	-20
86	Penalty for not recognizing a person (unable to retrieve associated, stored information)	-10
88	Penalty for misunderstanding the context	-10

9 Testing Misuse

Handle Obstacles (Selection Group)

Group (G-62)   **Type:** Selection   **Bonus:** 40
Undefined Skill

Error: Skill with ID 'NotDefined' not found.
Please define the skill using \DefSkill{skillId}{Points}{Default Description}{Category} or check for typos.
You can use the defined skill with \Skill{SkillId}[Sheet specific description] within a Group environment

Error: Skill with ID 'NotDefined2' not found.
Please define the skill using \DefSkill{skillId}{Points}{Default Description}{Category} or check for typos.
You can use the defined skill with \Skill{SkillId}[Sheet specific description] within a Group environment

Group (G-63)   **Type:** Sequential   **Bonus:** 20
Navigate to the bag, recognize its 3D pose and pick it up

32	Navigate to a specified target location	5
13	Recognize 3D pose of an unknown static object	30
46	Pick up a large unknown object	45

Group (G-64)   **Type:** Sequential   **Bonus:** 20
Follow a person while handling obstacles

| 33 | Detect, track and follow a person | 10 |
| **G-4** | *Handle obstacles such as avoiding objects, marked areas, and people during navigation* | |

Group with ID 'NonExistentGroup' not found.

Group (G-65)   **Type:** Sequential   **Bonus:** 30
Main Task: 'Carry My Luggage'

G-5	*Obtain information about the target bag, either by saving provided information or recognizing the target object*	
G-63	*Navigate to the bag, recognize its 3D pose and pick it up*	
G-64	*Follow a person while handling obstacles*	
32	Navigate to a specified target location	5