AN INTELLIGENT SERVICE ROBOT

FIELD OF THE INVENTION

[0001] The non-limiting and exemplary embodiments of the present disclosure generally relate to the field of robot, and more particularly relate to an intelligent service robot.

BACKGROUND OF THE INVENTION

[0002] With the coming of aging society, it requires enormous human power and considerable cost to take care of senior citizen, especially those having dementia/Alzheimer. Companion mobile robots have been designed and used to communicate with human like dementia/Alzheimer patients to help them and give them a companion.

[0003] Such companion mobile robots interact with the patients using a set of predefined messages, instructions, songs scripts and stories and were trained in controlled environment. However, these companions are not directed to be used in a home environment for a long term. In addition, the existing robots looks like more a cold machine than a friend or a companion. Therefore, it is hard to build a close relationship between the patient and the robot and also hard to make the best of the companion mobile robot to help the patient.

SUMMARY OF THE INVENTION

[0004] To this end, in the present disclosure, there is provided a new solution of an intelligent service robot, to mitigate or at least alleviate at least part of the issues in the prior art.

[0005] In an aspect of the present disclosure, there is provided an intelligence service robot. The intelligence service robot may comprise a robot head, a robot body, a robot base, a driving motor and an emotional lamp. The robot head is provided with an eye region behind which is provided at least one image capturing device for detecting a face of a subject and with a sound acquisition device configured to acquire a voice input of the subject. The robot body may be configured to support the robot head, wherein the robot head is attached with the robot body and rotatable around at least two

axes to provide a movement response to the subject. The robot body may further have a speaker arranged therein for providing a sound response to the subject. The robot base configured to support the robot body. The driving motor may be configured to drive the robot head to rotate around the at least two axes. The emotional display lamp may be configured to provide emotional indication information through lighting in a predetermined pattern.

[0006] In an embodiment of the present disclosure, the emotional display lamp may comprise a mouth lamp configured to provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject.

[0007] In an embodiment of the present disclosure, the emotional display lamp may comprise a chest lamp configured to provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject.

[0008] In an embodiment of the present disclosure, the emotional display lamp may comprise a cheek lamp configured to provide a light response in a predetermined pattern to provide the emotional indication information.

[0009] In an embodiment of the present disclosure, the emotional display lamp may comprise a nose lamp configured to provide a light response in a predetermined pattern to provide the emotional indication information.

[0010] In another embodiment of the present disclosure, the emotional display lamp may comprise any combination of a mouth lamp, a chest lamp, two cheek lamps, and a nose lamp, wherein the combination is configured to provide a combined light response in different predetermined patterns to provide different emotional indication information.

[0011] In a further embodiment of the present disclosure, the driving motor may be further configured to drive, together with lighting in a predetermined pattern, the robot head to rotate in a corresponding rotation pattern to enhance the emotional indication information.

[0012] In a still further embodiment of the present disclosure, the driving motor may be configured to drive, together with lighting in a first predetermined pattern, the robot head to swing from side to side to indicate happy emotion, wherein in the first predetermined pattern, each relevant lamp in the combination flashes and alternates among different colors.

[0013] In a yet further embodiment of the present disclosure, the driving motor may be configured to drive, together with lighting in a second predetermined pattern, the intelligence service robot to lower the robot head to indicate unhappy emotion, wherein in the second predetermined pattern, only the chest lamp in the combination is lighted.

[0014] In another embodiment of the present disclosure, the emotional display lamp comprises at least one ear lamp configured to provide a light response in a predetermined pattern when the microphone is waiting or acquiring voice input from the subject.

[0015] In a further embodiment of the present disclosure, the driving motor may be configured to drive the robot head towards the subject when the microphone is waiting or acquiring voice input from the subject.

[0016] In a still further embodiment of the present disclosure, the emotional display lamp may further comprise a forehead lamp configured to give a light response to the subject when the robot is booting up.

[0017] In a yet further embodiment of the present disclosure, the intelligence service robot may further comprise at least one of: an illuminance sensor configured to sense the illuminance around the intelligence service robot; a presence detector configured to detect presence of the subject near the intelligence service robot; and a temperature and humidity sensor configured to sense the temperature and humidity around the intelligence service robot.

[0018] In another embodiment of the present disclosure, the intelligence service robot may further comprise at least one external connector for interfacing with an external device, wherein the at least one external connector comprises one or more of: a power supply connector; a wide area network (WAN) connector; a universal serial bus (USB) connector; a local area network (LAN) connector, and an option switch.

[0019] In a further embodiment of the present disclosure, the intelligence service robot may further comprise a security slot for connecting with a security wire for anti-theft security.

[0020] In a still further embodiment of the present disclosure, the intelligence service robot may further comprise at least one functionality button and/or a reset switch.

[0021] In a yet further embodiment of the present disclosure, the intelligence service robot may further comprise one or more status indication lamp selected from: a power indication lamp; a wide area network (WAN) connection indication lamp; a local area network (LAN) connection indication lamp; and an error indication lamp.

[0022] In another embodiment of the present disclosure, the intelligence service robot may further comprise a backside microphone configured to acquire the voice input of the subject from the backside.

[0023] In a further embodiment of the present disclosure, the at least one image capturing device may be further configured to capture a Quick Response (QR) Code and a corresponding application may be executed in response to the captured QR code.

[0024] With embodiments of the present disclosure, there is provided an intelligence service robot with emotional indication lamps. These emotional display lamps could provide a better emotional indication, which increases the cuteness of the intelligence service robot and thus a closer emotional connection could be built up between the robot and the subject.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] The above and other features of the present disclosure will become more apparent through detailed explanation on the embodiments as illustrated in the embodiments with reference to the accompanying drawings, throughout which like reference numbers represent same or similar components and wherein:

[0026] Fig. 1 schematically illustrates a diagram of a front side of the intelligence service robot according to an embodiment of the present disclosure;

[0027] Fig. 2 schematically illustrates a diagram of a front side of the robot base of the intelligence service robot according to an embodiment of the present disclosure;

[0028] Fig. 3 schematically illustrates a diagram of a back side of the intelligence service robot according to an embodiment of the present disclosure;

[0029] Fig. 4 schematically illustrates a diagram of external connectors as provided on the backside of the support base according to an embodiment of the present disclosure;

[0030] Fig. 5 schematically illustrates a diagram of bottom view of the intelligence service robot according to an embodiment of the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

[0031] Hereinafter, the solution as provided in the present disclosure will be described in details through embodiments with reference to the accompanying drawings. It should be appreciated that these embodiments are presented only to enable those skilled in the art to better understand and implement the present disclosure, not intended to limit the scope of the present disclosure in any manner.

[0032] In the accompanying drawings, various embodiments of the present disclosure are illustrated in block diagrams, flow charts and other diagrams. Each block in the flowcharts or blocks may represent a module, a program, or a part of code, which contains one or more executable instructions for performing specified logic functions, and in the present disclosure, a dispensable block is illustrated in a dotted line. Besides, although these blocks are illustrated in particular sequences for performing the steps of the methods, as a matter of fact, they may not necessarily be performed strictly according to the illustrated sequence. For example, they might be performed in reverse sequence or simultaneously, which is dependent on natures of respective operations. It should also be noted that block diagrams and/or each block in the flowcharts and a combination of thereof may be implemented by a dedicated hardware-based system for performing specified functions/operations or by a combination of dedicated hardware and computer instructions.

[0033] Generally, all terms used in the claims are to be interpreted according to their ordinary meaning in the technical field, unless explicitly defined otherwise herein. All references to "a/an/the/said [element, device, component, means, step, etc.]" are to be interpreted openly as referring to at least one instance of said element, device, component, means, unit, step, etc., without excluding a plurality of such devices, components, means, units, steps, etc., unless explicitly stated otherwise. Besides, the indefinite article "a/an" as used herein does not exclude a plurality of such steps, units, modules, devices, and objects, and etc.

[0034] As mentioned in Background, the existing companion robots are not directed to be used in a home environment for a long term and it is hard to build a close

relationship between the patient and the robot. Thus, it is hard to make the best of the companion mobile robot to help the patient too. To this end, in the present disclosure, there is proposed an intelligence service robot with emotional indication lamps. These emotional display lamps could provide a better emotional indication, which can increase the cuteness of the intelligence service robot and thus a closer emotional connection could be built up between the robot and the subject.

[0035] Hereinafter, reference will be further made to Figs. 1 to 5 to describe the intelligence service as proposed in the present disclosure in details. However, it shall be appreciated that the following embodiments are given only for illustrative purposes and the present disclosure is not limited thereto.

[0036] Reference is first made to Fig. 1, which schematically illustrates schematically illustrates a diagram of a front side of the intelligence service robot according to an embodiment of the present disclosure.

[0037] As illustrated in Fig. 1, the intelligence robot 100 includes a robot head 110, a robot body 120 and a robot base 130. In addition, the intelligence service robot 100 also includes a driving motor (not illustrated). The robot head 110 is rotatably attached to and supported by the robot body 120, and the robot body is supported by the robot base 130, preferably in a removable way.

[0038] The robot head 110 is of a sphere shape or nearly sphere shape. On the robot head 110, there are two eye regions 111. Behind an eye region 111 is arranged an image capturing device 112 such a camera. The image capturing device 112 is configured to detect a face of a subject such as a patient or any other object. For example, the image capturing device 112 can be further configured to capture a Quick Response (QR) Code and in response the captured QC code, the robot could execute a corresponding application. The eye regions 111 can be made of semi-transparent or transparent material so as to not block image capturing device 112. Each of the eye regions can be configured with one image capturing device 112, or alternatively, only of them is provided with an image capturing device 112.

[0039] On the robot head 110, there is further provided a sound acquisition device 113. The sound acquisition device 113 could be a microphone, which could capture sounds from a person within 20cm to 1m. Such a microphone could receive

sound input from the user and the sound information could be processed by the intelligence robot or further transmitted to other servers or devices for processing.

[0040] As further illustrated, the robot head 110 is supported by the robot body 120. The robot head 110 is attached with the robot body 120 and can rotate around at least two axes to provide a head movement response to the subject. The robot head 110 could move up and down and also right and left by means of a driving motor. The driving motor could be for example but not limited to a pair stepping motors. The robot head 110 could move left and right within an angel range about 130 degree. The robot head 110 could also move up to about 55 degree and move down about 20 degree.

[0041] The robot body 120 further has a speaker 121 arranged therein. The speaker 121 could provide a sound response to the subject. The speaker 121 could be for example a monaural speaker, binaural speaker or any other type of speaker.

[0042] The robot base 130 provides a base for the robot body so that the robot could sit there on. On the same time, the robot base 130 also provides a space to arrange various status lamps and external connectors, which will be described with Figs. 2 and 4 and thus will not be elaborated herein.

[0043] The intelligence service robot 100 is further provided with an emotional display lamp so as to provide emotional indication information through lighting in a predetermined pattern. As illustrated in Fig. 2, the robot head 110 may include a mouths lamp 116 as the emotional display lamp. The mouth lamp 116 is off in a stead status and could light in red or flash in orange, red sand green to express emotion. For example, a plurality of lamps could form the mouth lamp 116.

[0044] The mouth lamp 116 is hidden behind the surface of the robot head and could provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject. In an embodiment of the present disclosure, the mouth lamp 116 could provide different mouth shapes in different cases. As an example, the mouth lamp could render a happy mouth with the lamps to show happiness and it could render a sad mouth with the lamps to express sadness. In another embodiment of the present disclosure, the mouth lamp 116 could emit different colors of light in different cases. For example, when to show happiness, colors of the lamps could change like neon lights in a predetermined pattern to enhance the happy mood.

[0045] On the robot head 110, there are also provided two cheek lamps 119 at two cheeks as the emotional display lamp. The cheek lamps 119 are off in the steady status, and could light in read and flash in red to express emotions, preferably together with mouth lamp 116. The cheek lamps 119 could be configured to provide a light response in a predetermined pattern to provide the emotional indication information. The cheek lamps 119 can emit red lights covering the central portion of the cheeks first and extending outwards so that it looks like that cheeks turn red gradually.

[0046] As a further emotional display lamp, the robot head 110 is provided with at least one ear lamp 115 configured to provide a light response in a predetermined pattern when the microphone is waiting or acquiring voice input from the subject. The ear lamp 115 could be off in the steady status and light in white and flash in white to express motions. For example, once the microphone 113 detects a sound from a user, the ear lamp can be turned on and flickers to wait the user to speak and when the user is speaking, the ear lamp is flashing.

[0047] Although not illustrated, the robot head 120 may be further provided with a nose lamp as the emotional display lamp. The nose lamp could be off in steady status and light and flash to express motions. The node lamp may be configured to provide a light response in a predetermined pattern to provide the emotional indication information.

[0048] In addition, the intelligence service robot 100 could comprise a chest lamp 122 as the emotional display lamp. The chest lamp 122 could be off in the steady status and could light and flash in different colors when the robot speaks or expresses motions. The chest lamp 122 may be configured to provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject.

[0049] On the robot head, there is also provided a forehead lamp 118. The forehead lamp 118 could be configured to give a light response to the subject when the robot is booting up. The forehead lamp 118 is turned off in the stead status, when there is an application running, it could light and flash in orange. It could light in green and orange alternately when it is booting up.

[0050] It shall be noted that although the intelligence service robot is described with the above emotional display lamps, the present disclosure is not limited thereto. In fact, it is possible that the emotional display lamp comprises any combination of a

mouth lamp, a chest lamp, two cheek lamps, a nose lamp and the head lamp. These lamps could be combined to provide a combined light response in different predetermined patterns to provide different emotional indication information.

[0051] Additionally, the driving motor can also be further configured to drive, together with lighting in a predetermined pattern, the robot head to rotate in a corresponding rotation pattern to enhance the emotional indication information. In an embodiment of the present disclosure, the driving motor may be configured to drive, together with lighting in a first predetermined pattern, the robot head to swing from side to side to indicate happy emotion, wherein in the first predetermined pattern, each relevant lamp in the combination flashes and alternates among different colors. For example, at least one of the cheek lamps, mouth lamps, nose lamps and the chest lamp can emit more than one color of lights, such as four colors like red, blue, green and yellow. When the robot detects a happy sing or sound, the lamps could light at the same time, and flash in different colors. Meanwhile the head could swing in a happy way just like what a happy person does. Such humanized happy expression could increase the cuteness of the intelligence service robot and build up a closer emotional connection between the robot and the subject.

[0052] In another embodiment of the present disclosure, the driving motor is configured to drive, together with lighting in a second predetermined pattern, the intelligence service robot to lower the robot head to indicate unhappy emotion, wherein in the second predetermined pattern, only the chest lamp in the combination lights. Such a humanized unhappiness expression could also increase the cuteness of the intelligence service robot and build up a closer emotional connection between the robot and the subject.

[0053] In a further embodiment of the present disclosure, the driving motor can be configured to drive the robot head 110 towards the subject when the microphone is waiting or acquiring voice input from the subject. For example, when the robot detects the user is saying its name, or the user is speaking to it, the intelligence service robot 100 will turn its head 110 to the direction where the sound is made and meanwhile ear lamps 115 will be turned on. In such a way, the user might feel that the intelligence service robot 100 could give the attention that he /she requires and it is easier to build a close relationship between the intelligence service robot and the user.

[0054] On the robot head 110, there is also provided a head button 117. The head button 117 is an operation button which is used to interrupt and stop the operation of the intelligence service robot 100.

[0055] On the robot base 130, there is provided a group 131 of status lamps, functional buttons, and a volume switch as illustrated by the dashed line block, which will be described in details with reference to Fig. 2.

[0056] As illustrated in Fig. 2, the group 131 of status lamps comprises a power status indication lamp 131a, a wide area network (WAN) status indication lamp 131b, a local area network (LAN) status indication lamp 131c, and an error indication lamp 131d. The power status indication lamp 131a is configured to indicate the status of power. The power status indication lamp 131a could be on if the power is on and off when the power is off. For example, the power status indication lamp is turned off when the power is off, lights in green when the power is on, flashes in orange when it is writing Flash Read Only Memory (ROM) and the power is on, and lights in read when activation of the robot failed. The WAN status indication lamp 131b is configured to indicate the state of Internet connection, off if the internet is disconnected and on if Internet is connected. For example, the WAN status indication lamp 131b is off when there is no connection to Internet, lights in green when it is in a normal statue to use Internet, and lights in red when Internet is unavailable for example due to no IP address acquisition. The LAN status indication lamp 131c is configured to indicate the state of wireless local network, it is off if the local network is disconnected and on if the local network is connected. For example, the LAN status indication lamp 131c is off if it is out of use wireless LAN, lights in green if the wireless LAN is available, flashes in greed when the intelligence service lamp is sending or receiving data, flashes in orange when it is setting wireless LAN, and flashes in red when the wireless LAN set up failed. The error indication lamp 131d is used to indicate the presence of the error; it lights in red when an error occurs due to for example operation failure. In such a case, the user could restart the intelligence service robot.

[0057] As illustrate in Fig. 2, there is also arranged with functional buttons 132, a volume switch 133 and a sensor 134. Functionalities of the functional buttons 133 can be assigned by applications. For example, the functionalities might include voice recording, music playing, and etc. The volume switch 133 is used to adjust the volume

of the speaker 121 if the switch 133 is turned from the right to the left or from the left to the right. In addition, the user may also press the volume switch 133 to mute the speaker or press it again to cancel the mute. The sensor 134 could be an illuminance sensor which is used to detect, for example, the illuminance in the room. The sensor133 could also be a human presence detection sensor configured to detect presence of the subject near the intelligence service robot 100. The illuminance sensor and human presence detection sensor could be integrated into one sensor or could be two separated sensors.

[0058] Fig. 3 further illustrates the backside of the intelligence service robot according to an embodiment of the present disclosure. As illustrated in Fig. 3, a backside microphone 123 and the temperature and humidity sensor 124 are further arranged on the backside of the robot body 120. The backside microphone 123 is also a built-in microphone like the microphone 113. The backside microphone 123 is configured to acquire the sound from the user from the backside of the robot. The temperature and humidity sensor 124 is configured to sense the temperature and humidity around the intelligence service robot.

[0059] At the robot base 130, there are further arranged a security slot 135 and a group 136 of external connectors. The security slot 135 is a slot for connection with security wire for anti-theft purposes. One connector in the group 136 is arranged at a side of the robot base and it is denoted as 136c which could be an optional LAN connector. For other external connectors in the group 136, reference will be made to Fig. 4, which schematically illustrates a diagram of external connectors as provided on the backside of the support base according to an embodiment of the present disclosure.

[0060] As illustrated in Fig. 4, in the group 136, there is provided a power supply connector 136a, a WAN connector 136b, four LAN connectors 136c, two USB connectors 136d, and an option switch 136e. The power supply connector 136a is configured to connect to an alternate current adapter, which is further connected to a power supply to for example charge the intelligence service robot. The WAN connector 136b is configured to connect with for example the broad band modem so as to connect with a wide area network like Internet. The LAN connector 136c is configured to connect with for example Ethernet cable so as to connect with the local area network. The USB connectors 136d can be used to connect with a USB cable or

USB device. The option switch 136e can be used to connect with peripherals by means of wireless setup (Wi-Fi Protected Setup, WPS). In addition, the intelligence service robot could also be provided with wireless communication capability like Wi-Fi, Bluetooth, ZigBee, etc., so as to communicate with other device wirelessly.

[0061] Fig. 5 further schematically illustrates a diagram of bottom view of the intelligence service robot according to an embodiment of the present disclosure. On the bottom of the robot base 130, in addition to fours pads 137, there is further provided a reset switch 138. The reset switch 138 could be used for initialization of the intelligence service robot. For example, the user could press the switch for 5 seconds using a think stick such a tooth pick which is not electrically conductive when the intelligence service robot is switched on. Such an operation could reset the intelligence service robot so that the router setup returns back to the factory default settings. However, such a resetting will not reset the conversation and speech settings.

[0062] With embodiments of the present disclosure, there is provided an intelligence service robot. Amongst others, the intelligence service robot is provided with emotional indication lamps, such as mouth lamps, nose lamp, cheek lamps, ear lamp, chest lamp, forehead lamp, etc. These emotional display lamps could provide a better emotional indication to the user, which can increase cuteness of the intelligence service robot and thus a closer emotional connection could be built up between the robot and the subject.

[0063] It shall be appreciated that the above embodiments are only given for illustrative purposes, and the present disclosure is not limited thereto. For example, it is possible to contain only one camera instead of two camera; the mouth lamps could have more than three lamps. The ear lamp could be provided on each of two ears. The chest lamp could be provided on different locations too. The external connectors could include different connectors or has different configurations. All of these variations, modification, additions, deletion fall within the scope of the present disclosure.

[0064] In addition, it shall also be appreciated that while this specification contains many specific implementation details, these should not be construed as limitations on the scope of any implementation or of what may be claimed, but rather as descriptions of features that may be specific to particular embodiments of particular

implementations. Certain features that are described in this specification in the context of separate embodiments can also be implemented in combination in a single embodiment. Conversely, various features that are described in the context of a single embodiment can also be implemented in multiple embodiments separately or in any suitable sub-combination. Moreover, although features may be described above as acting in certain combinations and even initially claimed as such, one or more features from a claimed combination can in some cases be excised from the combination, and the claimed combination may be directed to a sub-combination or variation of a sub-combination.

[0065] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The above described embodiments are given for describing rather than limiting the disclosure, and it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the disclosure as those skilled in the art readily understand. Such modifications and variations are considered to be within the scope of the disclosure and the appended claims. The protection scope of the disclosure is defined by the accompanying claims.

WHAT IS CLAIMED IS:

1. An intelligence service robot, comprising:

a robot head with an eye region behind which is arranged at least one image capturing device for detecting a face of a subject and with a sound acquisition device configured to acquire a voice input of the subject;

a robot body configured to support the robot head, wherein the robot head is attached with the robot body and rotatable around at least two axes to provide a movement response to the subject, and the robot body further has a speaker arranged therein for providing a sound response to the subject;

a robot base configured to support the robot body;

a driving motor configured to drive the robot head to rotate around the at least two axes; and

an emotional display lamp configured to provide emotional indication information through lighting in a predetermined pattern.

2. The intelligence service robot of Claim 1, wherein the emotional display lamp comprises a mouth lamp configured to provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject.

3. The intelligence service robot of Claim 1 or 2, wherein the emotional display lamp comprises a chest lamp configured to provide a light response in a predetermined pattern when the speaker is providing the sound response to the subject.

4. The intelligence service robot of any of Claims 1 to 3, wherein the emotional display lamp comprises a cheek lamp configured to provide a light response in a predetermined pattern to provide the emotional indication information.

5. The intelligence service robot of any of Claims 1 to 4, wherein the emotional display lamp comprises a nose lamp configured to provide a light response in a predetermined pattern to provide the emotional indication information.

6. The intelligence service robot of any of Claims 1 to 5, wherein the emotional display lamp comprises any combination of a mouth lamp, a chest lamp, two cheek lamps, a nose lamp, wherein the combination is configured to provide a combined light response in different predetermined patterns to provide different emotional indication information.

7. The intelligence service robot of any of Claims 1 to 6, wherein the driving motor is further configured to drive, together with lighting in a predetermined pattern, the robot head to rotate in a corresponding movement pattern to enhance the emotional indication information.

8. The intelligence service robot of Claim 7, wherein the driving motor is configured to drive, together with lighting in a first predetermined pattern, the robot head to swing from side to side to indicate happy emotion, wherein in the first predetermined pattern, each relevant lamp in the combination flashes and alternates among different colors.

9. The intelligence service robot of Claim 7 or 8, wherein the driving motor is configured to drive, together with lighting in a second predetermined pattern, the intelligence service robot to lower the robot head to indicate unhappy emotion, wherein in the second predetermined pattern, only the chest lamp in the combination is lighted.

10. The intelligence service robot of any of Claims 1 to 9, wherein the emotional display lamp comprises at least one ear lamp configured to provide a light response in a predetermined pattern when the microphone is waiting or acquiring voice input from the subject.

11. The intelligence service robot of Claim 10, wherein the driving motor is configured to drive the robot head towards the subject when the microphone is waiting or acquiring voice input from the subject.

12. The intelligence service robot of any of Claims 1 to 11, wherein the emotional display lamp further comprises a forehead lamp configured to give a light response to the subject when the robot is booting up.

13. The intelligence service robot of any of Claims 1 to 12, further comprising: at least one of:

an illuminance sensor configured to sense the illuminance around the intelligence service robot;

a presence detector configured to detect presence of the subject near the intelligence service robot; and

a temperature and humidity sensor configured to sense the temperature and humidity around the intelligence service robot.

14. The intelligence service robot of any of Claims 1 to 13, further comprising at least one external connector for interfacing with an external device, wherein the at least one external connector comprises one or more of:

a power supply connector;

a wide area network (WAN) connector;

a universal serial bus (USB) connector;

a local area network (LAN) connector, and

an option switch.

15. The intelligence service robot of any of Claims 1 to 14, further comprising a security slot for connecting with a security wire for anti-theft security.

16. The intelligence service robot of any of Claims 1 to 15, further comprising at least one functionality button, and/or a reset switch.

17. The intelligence service robot of any of Claims 1 to 16, further comprising one or more status indication lamp selected from:

a power indication lamp;

a wide area network (WAN) connection indication lamp;

a local area network (LAN) connection indication lamp; and

an error indication lamp.

18. The intelligence service robot of any of Claims 1 to 17, further comprising a backside microphone configured to acquire the voice input of the subject from the backside.

19. The intelligence service robot of any of Claims 1 to 18, wherein the at least one image capturing device is further configured to capture a Quick Response (QR) Code and a corresponding application is executed in response to the captured QR code.