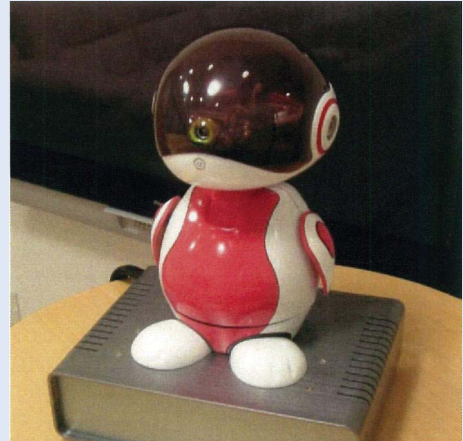


Robot

Creator : *UEDA Hirotada and
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(Flow Design Studio Ltd.)*

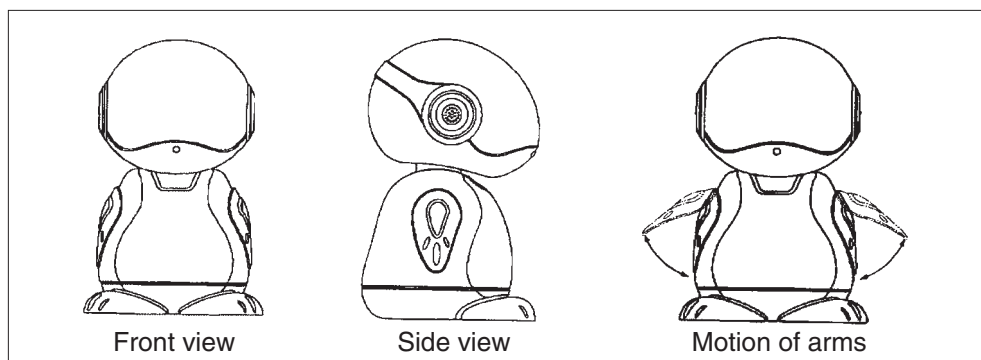


External view of robot

Overview of design

This section was originally dedicated to “patent introduction”, but in this issue, we will in fact introduce an “industrial design”. Like a patent, an industrial design is among the class of industrial property rights, and a business may obtain the rights to a design — such as a unique form — that will then be protected for 15 years from the date of registration by Japan Patent Office. In other words, the design is treated as an intellectual property right.

This robot has the shape shown in the figure below and is equipped with a camera, microphone, and speech-recognition functions. It can converse with humans, connect sensors and cameras (installed in rooms, the entrance hall, and hallways) as well as home electronic appliances to the home network and control these devices and monitor the rooms. The robot was created to serve as an intermediary between humans and these sensors and home electronic appliances. This robot cannot move on its own, and is intended for stationary placement in each room and in the hallways of the home. It was designed to be endearing to all members of the family, while also offering a hint of intelligence. The goal of the design was to allow the robot to inconspicuously assist the inhabitants of the house so that they may live more comfortably, and for the robot to keep a close watch over these residents without being too intrusive. Further, we hope to provide the robot with the ability to learn the preferences and daily patterns of the inhabitants through conversation, so that it may then propose and provide the most suitable services. In this manner, conversations between the robot and humans are envisaged, so it is designed accordingly to move its head, arms, and torso, assuming a number of expressive postures. The present design constitutes the only design rights presently owned by NICT.



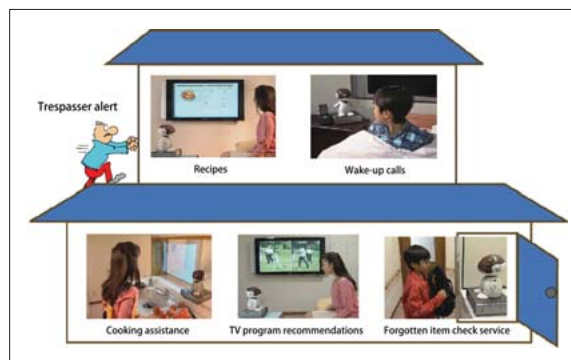
Overview of robot

The present robot is named “Phyno”, and it has taken part in a real-life validation experiment during which it lived for a certain length of time with the inhabitants of a Ubiquitous Home, in which home electronic appliances and installed sensors are connected by a home network. The experiment was performed to study the reactions of the inhabitants to a variety of new services envisioned for daily life in the future, provided via the robot by home information appliances.

	Specifications
Motion	Head (three degrees of freedom), arms (up-down), torso (rotation), and voice (R, L)
Input	Camera, microphone, speech recognition (all are expandable)
Size	26 cm in width × 21 cm in depth × 34 cm in height Weight: Approximately 3 kg

The present robot, designed to take on the roles described above, had been assembled as a humanoid robot in accordance with initial conceptual designs and was equipped with mechanical parts and sensors. The robot’s current specifications are presented in the Table below. It is 30 cm in height, approximately the size of a normal stuffed toy. The mechanical parts are driven by six servo motors for three degrees of freedom of the head (forward-backward, right-left, and rotation), raising and lowering of the two arms, and rotation of the torso. A camera may be installed in the front of the face and a microphone may be placed inside the head. The video output from the camera and the microphone output will be processed by image- and speech-recognition functions, to enable the robot to hold a conversation with humans using both voice and body language.

Let us now take a peek into life with this robot inside the future “Ubiquitous Home” created by the author. In the children’s room on the second floor, a robot gently wakes up the child in the morning for school. The robot will wake the child up at the most appropriate time, judged based on the time the child went to sleep the night before and information on events and activities provided by the school. On the first floor, another robot is giving cooking advice to the mother while she is preparing breakfast. In this case, the robot’s advice is based on the contents of the refrigerator and their expiration dates. After the child finishes eating his breakfast and is about to leave for school, a robot in the entrance hall will tell him whether he has forgotten anything. In providing this advice, the robot uses information such as special items required based on the child’s class schedule and the day’s weather.



Examples of use in a Ubiquitous Home

Commercialization of the robot

The robot has been commercialized by the Yuvi Zoukei Corporation in light of anticipated demand for the developed robot, based on all of its basic features enabling it to act as an intermediary between humans and machines, in addition to its significant expandability. The commercialized robot is comprised of only the basic robot body with basic body movements, and is expandable to accommodate devices such as cameras and microphones. Therefore, the consumer may add parts as required for the intended use, to create a customized interface robot.

(Article written by SAWADA Fumitake, Expert, Intellectual Property Management Group, Research Promotion Department)

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