The Robot Award of the Year given to robots for their outstanding services!

GUIDE BOOK

for The Robot Award of the Year

What is The Robot Award of the Year?

Robots, parts, software, and more are eligible.
What kind of robots can be entered?

Thorough analysis!

Introduction of robots that have won The Robot Award of the Year

Introduction of all robots that received awards in FY2006-2008!

Hosted by Ministry of Economy, Trade and Industry &
The Japan Machinery Federation

KEIRIN

This project is subsidized by the Japan Keirin Association.

What is The Robot Award of the Year?

The Robot Award of the Year (hosted by Ministry of Economy, Trade and Industry & The Japan Machinery Federation) is a program that selects and recognizes robots which provided outstanding services in the year and showed strong contributions to and have a high potential for creating future markets, in order to promote robotic technology innovations, expand the use of robots and stimulate demand for robots in Japan.This award program was established in fiscal 2006 aiming at further developing the robot industry and spreading the use of robots in daily life.

Outline of The Robot Award of the Year

*Guidelines for applications for fiscal 2008

Hosted by	Ministry of Economy, Trade and Industry & The Japan Machinery Federation
Details of commendation	**Grand Prize** (Economy, Trade and Industry Minister Award) Given to a robot, part, or software that won First Prize and is judged as the most excellent based on the screening criteria. **SME Venture Prize** (Small and Medium Enterprise Agency Director-General Award) Given to a robot, part, or software that won First Prize and is judged to be the most excellent for its use of flexible ideas specific to small and medium sized firms. **Japan Machinery Federation President Award** Given to a robot, part, or software that won the First Prize and is judged to be particularly excellent in terms of robot industry development. **Organization for Small & Medium Enterprises and Regional Innovation Award** Given to a robot, part, or software that won the First Prize and is judged to be excellent in terms of robot industry development in the field of small and medium firms. **First Prize** Given by category to a robot, part, or software that is judged to be excellent based on the screening criteria. **Jury's Choice Prize** Given by the Screening Committee, as appropriate, to a robot, part, or software that is judged as particularly excellent based on the screening criteria
Items screened	Robots, parts, or software that provided outstanding services in Japan during the fiscal year when applications for the award are accepted.
Category	• **Service Robot category** • **Industrial Robot category** • **Public and Frontier Robot category** • **Parts and Software category**
Screening criteria	**The evaluation standards in screening are a robot's contribution to and potential for creating a market (the following 1. and 2.) and technological innovativeness (the following 3.)** **1. Social needs** Results of introduction and sales, potential for future creation of robot markets, degree of merit, public interest, and degree of need **2. Value from the user's point of view** Convenience, practicality, economy, design, maintenance costs, etc. **3. Technological innovativeness** Safety, novelty, technical stability, multiplicity of operating environment, operability, etc. * In the screening process, the Screening Committee may select excellent robots, parts, or software by comprehensively evaluating 1. to 3. above, or may select excellent robots, parts, or software by focusing on either 1., 2., or 3. above.

Introduction of the Robot Award FY2006-2008

The Robot Award 2008

Omnibot17μ i-SOBOT (Omnibot One-Seven Mu i-Sobot)

Tomy Company, Ltd.

The world's smallest bipedal humanoid robot in mass production, as certified by Guinness World Records. With 17 proprietarily-developed ultra-small servo-motors, the product has about 200 action patterns. The company managed to make the robot very safe and durable so that it can be used at home, yet remains at an affordable price. Coming with highly-safe AAA NiMH batteries, this robot can operate for more than one hour between battery recharges, providing excellent energy efficiency.

A robot which can conduct various actions with excellent balance, speak, play instrument, and even perform music while moving

The i-SOBOT uses a gyro-sensor that automatically adjusts balance while walking. It provides more than 200 actions and speaks about 180 words and 90 kinds of sound effects, each of which matches the respective action, plays musical instruments, dances, and can impersonate people.

Comments from the recipient

After receiving the award, i-SOBOT has been in the limelight thanks to various TV programs, newspapers, magazines, and other mass media, and has been widely known to the public. We have been invited to join various robot shows in Japan and abroad, and we are sure that we succeeded in make known the uniqueness of robot technologies in Japan. Furthermore, staff in-house were also able to further their understanding of robots and we are stepping our efforts in facilitating the development of new robots.

Mr. Kimitaka Watanabe
Group Leader
Strategy Development Group
TOMY COMPANY,LTD.

A robot which is friendly to people and the earth and stands firmly without batteries

Considering its use at home, the i-SOBOT is designed with a focus on safety and durability. If excessive force is applied, it absorbs the shock so that it is not easily broken. Powered by highly-safe AAA NiMH batteries "eneloop" available on the market, it is capable of action for 60 minutes or more on one charge as it is very energy efficient, which enables it stand without being powered on. This means it uses the least energy compared with any other mass-produced bipedal robots in the world. The i-SOBOT has been chosen as the mascot for an energy-saving contest, and is playing a key role in education programs held in Japan and abroad to teach the importance of the global environment and energy-saving.

A. Certified by Guinness World Records as the world's smallest bipedal humanoid robot, it has successfully entered mass production!

Ultra-small servo-motors enable a small body. At 16.5 cm in height, the Omnibot17μ i-SOBOT was certified by Guinness World Records as the world's smallest humanoid robot in mass production in 2006 and listed in the 2007 Guinness Book of World Records.

The world's smallest bipedal humanoid robot is now being mass produced.

Using the "servo unit μ," a proprietary compact, Japanese-made ultra-small servo-motor, the i-SOBOT was certified by Guinness World Records in 2006 as the world's smallest bipedal humanoid robot in mass production and listed in the 2007 Guinness Book of World Records. With 17 joint parts, the i-SOBOT has successfully been put to practical use, as it is only 16.5 cm tall, weighs 350g, is easily carried in one hand, and is inexpensive at 29,800 yen (excluding consumption tax).

Simple operability pleases all users.

The i-SOBOT comes fully assembled and the user can enjoy operating it immediately after purchase. Easy controlling allows everyone to handle it. In programming mode, the user can make original programs as he/she likes, for a maximum of 240 actions. The robot is equipped with the function to recognize sounds, also enabling the user to operate the robot by oral instructions as if he/she talks to the robot, without using a controller. In terms of design, the i-SOBOT won the gold award of the 2008 Good Design Award, and was displayed in the exhibition "WA: The Sprit of Harmony and Japanese Design Today," which was held for two years around the world. The robot was chosen as one of Japan's representative designs. The i-SOBOT has been chosen as a mascot for an energy-saving contest, and is playing a key role in education programs to teach the importance of the global environment and energy-saving. The company has received a lot of comments from many of the people who actually operated the robot in the events, to the effect that they have become interested in studying robotics and science.

The Robot Award 2007

Pair of M-430iA Robots, enabling high-speed handling using visual tracking functions

FANUC Ltd.

The articulated-type robot M-430iA can pick up a large amount of items accurately in a moment as they roll down a conveyor belt at high speed. The pair of M-430iA Robots is capable of handling more than 200 items per minute and operating 24 hours a day. The robot adopts a wrist structure made of combined resin gears to prevent articles from being contaminated with oil, and a highly chemical-proof arm that can be cleaned with acid and alkaline cleaners to increase cleanliness and cleaning capability. Thanks to these features, it is used at many food and pharmaceutical distribution sites worldwide. Since its launch in October 2006, the number of inquiries and orders has continued to smoothly increase.

Comments from the recipient

M-430iA, a food and pharmaceutical handling robot, has been applied not only to the initially-anticipated food and pharmaceutical sectors, but to the cosmetics sector as well. Currently, the ratio of food, pharmaceutical, and cosmetics sectors is about one third each. Since these sectors tend to be resistant to economic recession, inquiries and orders for the robots continue to increase despite the harsh economic condition. Thanks to the receipt of The Robot Award 2007, the robot has been highly regarded, especially in business negotiations and other occasions in Japan and abroad.

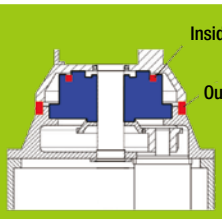
Mr. Shinsuke Sakakibara
Managing Executive Officer
FANUC LTD.

The robot picks up items not only by using its hands but also by looking them with its eyes and thinking about them. It also beautifully packs randomly-oriented items that come down on a conveyor in boxes!

The robot, which has a high degree of intelligence, can visually confirm products which are randomly rolling down a conveyor belt at high speed identifying images and through its eyes, instantly thinking about the situation and picking up the objects in a proper manner.

A market cultivated for new clean robots!

In addition to being able to transport a large amount of products, robots in the food and pharmaceutical sectors are required to be clean and have capability and chemical resistance, which are all particular to the food and pharmaceutical sectors. With the functionality to satisfy these requirements, the M-430iA Robots have cultivated an active role for themselves in sectors that go beyond the food and pharmaceutical sectors – markets that had been the main ones for industrial robots. Previously, industrial robots worked mainly at automobile, electric and electronic parts manufacturing sites.



- **Material and Surface Finishing enduring alkaline cleaning and acid cleaning**
- **Structural components designed to prevent the penetration of dust or spray**

The robot picks up many items on a conveyor quickly and puts them down on another conveyor belt or in boxes while accurately placing them in a known position and orientation.

Consisting of two M-430iA industrial-use arm robots, this robot can perform two robots' work. The two robot arms, or robot "hands," precisely pick up as many as 200 items per minute conveyed from a conveyor randomly, at a speed faster than the eye can follow and then put them swiftly down on another conveyor or in boxes while accurately placing them in a known position and orientation.

Development of new markets by handling issues in the food and pharmaceutical sectors

Up till now, industrial robots have played active roles mainly in the automobile, electric and electronic parts manufacturing sites. In addition, in general industry – in particular in manufacturing sites such as the food and pharmaceutical sectors – there are moves to make use of robots. In these kinds of manufacturing sites, robots need not only to have the processing capability of industrial robots but must also provide the functions of cleanliness, safety, and reliability. However, single conventional robots did not have sufficient processing power, and several were needed to be set in line. Under such circumstances, it was difficult to spread the use of industrial robots as additional expenses and installation spaces were needed.

By achieving characteristics such as cleanliness, cleaning capability, and chemical resistance in addition to the sought-after advanced processing power, the M-430iA Robot has made the food and pharmaceutical sectors into its new markets.

Handling work in high-speed and continuous operations

This robot's high-speed processing is realized by optimally controlling two motors mounted on each basic axis, or in a manner combining two robots into one. In addition, it has a vision tracking function that combines intelligent image recognition and tracking functions. With the vision tracking function, two robots can accurately pick up products which are randomly rolling down a conveyor belt at a speed of 200 units per minute, faster than the eye can follow, and then put them down on another conveyor belt or in boxes while placing them in a known position and orientation.

This low-priced, flexible robot system conducts high-quality operations continuously 24 hours a day in place of conventional handling systems that rely on manual work and special machines.

The Robot Award 2006

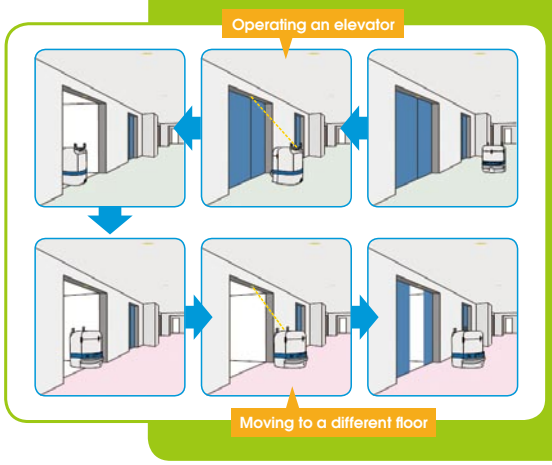
Building a cleaning system using robots

Fuji Heavy Industries Ltd. and Sumitomo Corporation

This system is a cleaning robot that cleans an office building while moving between floors by operating the elevator system itself. After finishing cleaning, the robot returns itself to the place of storage where it started from. It has been already introduced to about 20 high-rise buildings in Harumi Triton Square, Roppongi Hills and Central Japan International Airport Co., Ltd (as of October 2009).

The robot is able to operate the elevator for itself to ride in and get out.

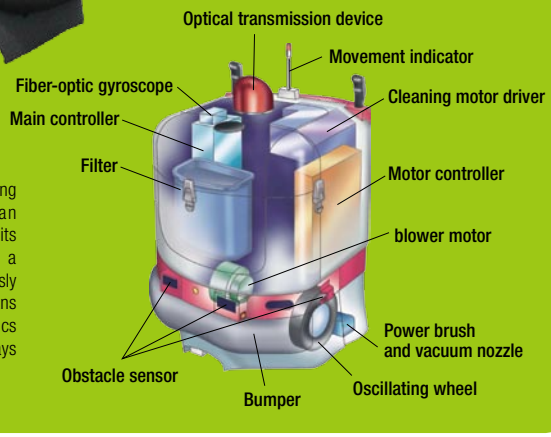
Capable of communicating with the elevator via an optical transmission device, the cleaning robot can get in and out the elevator, and even operate it to go to the desired floor. After finishing cleaning, the robot returns to the place where it started from.



- Storage space
- The cleaning robot leaves.
- Start of cleaning
- Cleaning operations
- Moving to the elevator
- Calling the elevator
- Arrival of the elevator
- Arrival of the elevator at the destination
- The robot finishes cleaning of all the floors.
- Storage space

A robot which cleans a building in nights

The robot is busy cleaning the building by itself midnight. Without human assistance, the cleaning robot judges its location using data obtained through a built-in gyro sensor, moves autonomously along a predetermined route, and cleans building floors. One of its characteristics is that, unlike a human cleaner, it always maintains a fixed level of cleaning.



Comments from the recipient

The significance of the award is that the building cleaning system using the robot has widely been recognized publicly at large. Having received the award, we are continuing to broaden the range of scenarios in which the robot operates by developing the capability for the robot to move from carpeted surfaces to hard floors via the laser triangulation movement method, practicalizing an automatic program generation system that allows for automatic creation of a movement program by entering the movement route into a computer, and receiving ISO9001 accreditation specifically for service robots.

Dr. Hajime Aoyama
General Manager Clean Robot Dept.
Strategy Development Div.
Fuji Heavy Industries Ltd.

Cost reduction realized and operational efficiency improved through the robot's movement between floors.

Building cleaning hours are usually limited to about two hours from midnight or 8:00 a.m. As the robot cleans in nights and needs no lighting even nor air-conditioning, it contributes to improving operational efficiency and saving energy.

As the robot can move between the office building's floors using the elevator, even a small number of robots can clean a wide area, thereby reducing cleaning costs. Monthly cleaning cost for 1 square meter of carpet is about 100 yen per person, compared with about 50 yen per robot (when cleaning a building of 20 floors with a total space of 5,000 square meter or more).

Sure elevator control and stable travelling movement

The cleaning robot features a simple mechanism by having a travelling method based on straight forward movement and spin turn; compact size; moving without requiring positional data; and the characteristics long-term stable travelling achieved by means of gyro angle error correction. Additionally, in introducing this robot, there were three specifications that needed to be met: a cleaning robot, a system linking the cleaning robot and the elevator, and an elevator operating system. Consequently, we collaborated with the party purchasing the robot in a scrupulous manner and introduced it.

In a new building, the clean robot gets in and out of the elevator using communications between optical transmission devices which are installed in the elevator. The entering/exiting and control methods seen here are very similar to those for people in which they enter the elevator (while the robot uses communications) to ride on and get out the elevator. The cleaning robot is able to confirm its current location, call the elevator, move between floors in the building, and move along and clean each floor in an autonomous manner.

List of All Prize-Winning Robots for FY2006-2008

Here is the introduction of 31 robots, parts, and software that won The Robot Award of the Year between fiscal 2006-2008. For more details, please refer to the Prize Winners Library on The Robot Award of the Year website.

The Robot Award 2008

Grand Prize (Economy, Trade and Industry Minister Award)

Omnibot17μ i-SOBOT

TOMY COMPANY,LTD.

SME Venture Prize (Small and Medium Enterprise Agency Director-General Award)

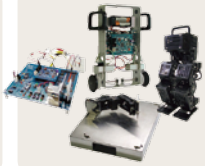
Booktime

Nishizawa Electric Meters Manufacturing Co., Ltd.

Japan Machinery Federation President Award

MOTOMAN-CDL3000D

YASKAWA Electric Corporation



Organization for Small & Medium Enterprises and Regional Innovation Award

ZMP e-nuvo

ZMP INC.

Jury's Choice Prize

Rice Transplanting Robot

National Agriculture and Food Research Organization/
National Agricultural Research Center

First Prize - Industrial Robot category

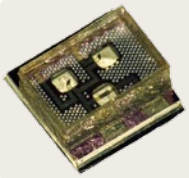
Integrated Compact Robot XR-G Series

DENSO WAVE INCORPORATED

First Prize - Public and Frontier Robot category

Active Scope Camera

Tohoku University/
International Rescue System Institute



First Prize - Parts and Software category

MEMS tactile sensor

University of Tokyo/
Panasonic Corporation

The Robot Award 2007

Grand Prize (Economy, Trade and Industry Minister Award)

M-430iA

FANUC LTD.

SME Venture Prize (Small and Medium Enterprise Agency Director-General Award)

miuro

ZMP INC.

Japan Machinery Federation President Award

Autonomous Mobile Courier Robot System for Blood Samples

Panasonic Electric Works Co., Ltd.

Organization for Small & Medium Enterprises and Regional Innovation Award

AC servo actuator

Harmonic Drive Systems Inc.

Jury's Choice Prize

MR-image-guided Compact Surgical Robotic System

Kyushu University/ Hitachi Ltd./
Hitachi Medical Corp./ Mizuho Co., Ltd./
University of Tokyo/ Waseda University

First Prize - Service Robot category

LEGO MINDSTORM Education

Lego Japan Co., Ltd. (Lego Education)

First Prize - Service Robot category

Humanoid Robot, HOAP

Fujitsu Limited/ Fujitsu Laboratories Ltd./
Fujitsu Automation Limited

First Prize - Industrial Robot category

Conveying of Medicine Container Robot

TSUMURA & CO./ Fuji Heavy Industries Ltd.

First Prize - Public and Frontier Robot category

Endovascular Surgery Training -Evaluation-Simulation EVE EndoVascular Evaluator

FAIN-Biomedical Inc./ Nagoya University

First Prize - Public and Frontier Robot category

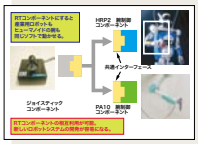
Fire-fighting Robot

Komatsu Ltd./IVIS CO.,LTD./
Cyverse Corporation/ I–DEN Videotronics Inc./
MURUMA TECHNICA CO.,LTD.

First Prize - Parts and Software category

HG1T/HG1H small teaching pendant

IDEC Corporation



First Prize - Parts and Software category

OpenRTM-aist-0.4.0

New Energy and Industrial Technology Development Organization/
Advanced Industrial Science and Technology/
Japan Robot Association

First Prize - Parts and Software category

Open Robot/Resource Interface Network "ORiN"

DENSO WAVE INCORPORATED

The Robot Award 2006

Grand Prize (Economy, Trade and Industry Minister Award)

Building Cleaning Robot System

Fuji Heavy Industries Ltd./ Sumitomo Corporation

SME Special Prize

KHR-2HV

Kondo Kagaku Co.,Ltd.

Jury's Special Prize

Meal-assistance Robot "My Spoon"

SECOM CO.,LTD.

First Prize - Service Robot category

Mental Commitment Robot Paro

Intelligent System Co.,Ltd./
Advanced Industrial Science and Technology/
Microjenics Inc.

First Prize - Industrial Robot category

MOTOMAN-DIA10/ MOTOMAN-IA20

YASKAWA Electric Corporation

First Prize - Industrial Robot category

Vision Inspection Robot

DENSO WAVE INCORPORATED

First Prize - Public and Frontier Robot category

Remote control construction robot

Ministry of Land, Infrastructure, Transport and Tourism/
Fujita Holdings Co., Ltd.

First Prize - Public and Frontier Robot category

Deep Sea Cruising Autonomus Underwater Vehicle "URASHIMA"

Japan Agency for Marine-Earth Science and Technology

First Prize - SME Venture category

Scanning laser range finder (SOKUIKI sensor)

HOKUYO AUTMATIC CO.,LTD.

First Prize - SME Venture category

HAMADE Squid Fishing Machine

Towa Denki Seisakusho.,Inc.

Details are announced through The Robot Award of the Year website.

The Robot Award of the Year official website http://www.robotaward.jp/

The Robot Award of the Year PR Secretariat E-mail : info@robotaward.jp