

ДОПОЛНИТЕЛЬНО,



MR. ROBOTO

Japanese
Things



Story & Photographs
by Tony McNicol

In the main treatment room ailing patients lie amongst tangles of wires, screwdrivers, multimeters, tools, and schematics. Somewhere, an electronic voice is plaintively asking, “Shall we play?” Meanwhile, two big, cute green eyes peer down from a poster on the wall. “Let’s be friends,” reads the tagline. “When you were a kid, you had a friend robot in your dream. It was me, the little robot PLEN.”

Welcome to the Akazawa Robots Clinic, the latest symptom of Japan’s long infatuation with robots—in particular, humanoid robots. “We thought a clinic would be better than a repair shop,” explains head doctor Kazuhiro Oono. “Japanese people treat robots differently from other toys.” Most of Japan’s humanoid robot manufacturers are too small to have their own repair departments. But

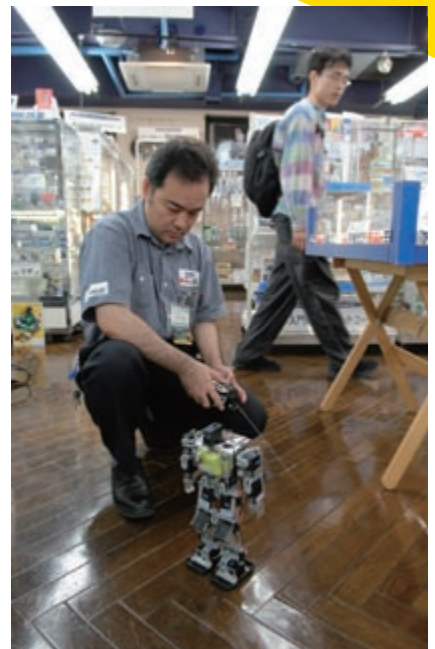
since August 2006, this Osaka-based clinic has been treating home robots of all shapes and sizes.

Sporting a sparkling white lab coat, Oono explains how each robot gets a patient’s chart—just like a real hospital. After repairs in the “treatment” room, they are tested in the “rehabilitation” department. Once, he recalls, the clinic admitted a broken robot that belonged to a married couple. It came with a letter saying: “Please look after Chibi [“Shorty”].” “They probably wouldn’t have sent the robot to a ‘repair shop,’” muses Oono. “Japanese people don’t want their robots repaired, they want them treated.”

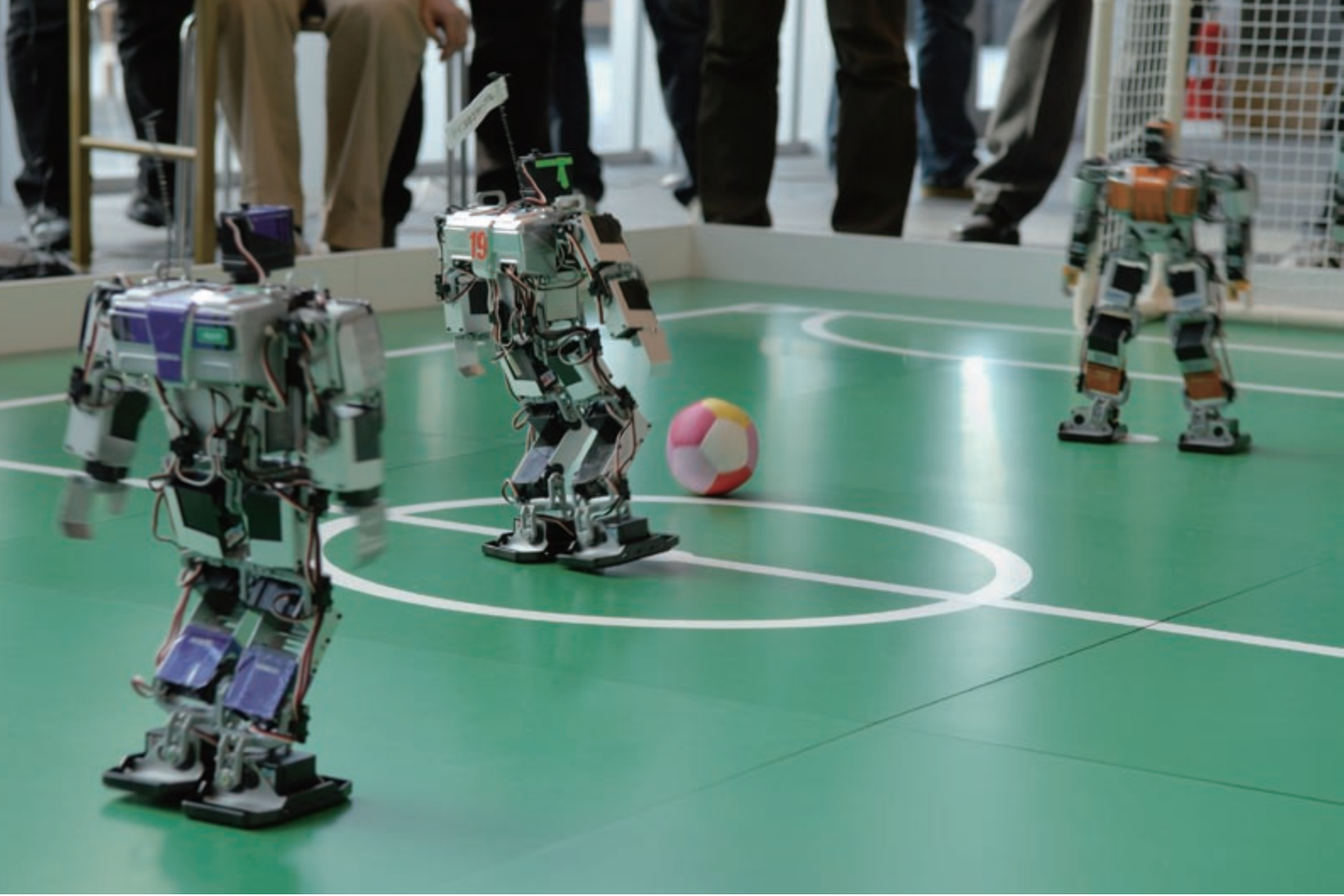
PLAY THROUGH THE PAIN

Japan is already the industrial robot capital of the world, but in the last few years robots have stepped out of the factory and into homes and schools. Manager Sadahiro Arai of the Tsukumo Robot Kingdom in Tokyo says that over a hundred humanoid robots kits are sold each month at his robot superstore. They cost from around ¥100,000 to ¥300,000. As well as walking humanoids, the shop also stocks books and magazines on robotics, inexpensive toy robots, and a wide range of parts and tools.

With the advent of cheap and powerful joint servomotors a few years ago, sophisticated humanoid



PLEN takin’ it to the streets (opposite page); head shot of Hiroshi Ishiguro’s big-eyed robot (atop byline); Sadahiro Arai and walking humanoid (top); citizen of Tsukumo Robot Kingdom (above); Kazuhiro Oono attends to a patient (lower left).



robots have come within the reach of serious amateurs, explains Arai. “At first, most of our customers were men around the age of 30 with technical-type jobs,” he says. “Nowadays we get lots of families, even some retired people, too.” Situated right in the middle of the electronics district of Akihabara, the shop has become a mecca for amateur roboticists from all over Japan, and even as far away as Shanghai and Taipei.

Many customers enter “Robocon” competitions, pitting their robots against each other in foot races, soccer-matches, and sumo-like robot battles. “Everyone comes here after the competition to buy replacements for broken parts,” says Arai. Users tend to push their robots to their limits, and injuries are common. But since the robots are sold as self-assembly kits, owners have to do their own repairs.

YOU TOO ON YOUTUBE

Systec Akazawa, the Osaka industrial parts manufacturer that runs the Akazawa Robots Clinic, also sells its own kit robot, a small chunky gray humanoid called PLEN. “Our main aim was to make a robot small enough

to operate on a customer’s desk,” says PLEN producer Yohei Akazawa. As we talk in a meeting room above one of their Osaka factories, he demonstrates how to control PLEN using his Bluetooth-equipped mobile phone. Right on cue, the 23cm-high robot





obediently rollerskates across the table between us. The robot costs ¥250,000 and comes in a kit of around 20 parts. He can stamp his feet, dance, wave, and clap his hands. “We are having a lot of fun building the robot, but it is difficult to make money from it,” says Akazawa.

But despite modest sales, the robot has caught plenty of attention, even starring in several Japanese TV commercials. Earlier this year, someone took a video of their homepage and put it on internet video-clip website YouTube; the clip was viewed 1.5 million times. Systec Akazawa soon received a slew of requests from the U.S. enquiring about the robot.

THE SOUL IN THE MACHINE

Japan’s love affair with robots in an old and deep one. Many people trace the origins of Japanese robotics back to 18th- and 19th -century *karakuri ningyo* dolls, complex and lifelike wooden automata that amazed spectators in Shinto shrines, samurai homes, and from the top of floats at festivals.

More recently, manga and anime robots have been the faithful companions of generations of Japanese schoolchildren; robot heroes that include *Doraemon*, a cuddly robot cat

with a fourth-dimensional pocket, *Ironman No.28*, a pointy-nosed radio-controlled robot, and the skyscraper-high mobile robot suits of the *Gundam* franchise. Arguably though, the best-loved of all fictional robots is *Astro Boy*, the atomic powered, jet booted hero of manga by the late Osamu Tezuka and star of Japan’s first TV anime series.

In 2003, the year of *Astro Boy*’s fictional birth, work started on a remake of one well-known *Astro Boy* story called “The World’s Strongest Robot.” The new version is drawn by best-selling manga artist Naoki Urasawa, and the four installments so far have sold no less than four million copies. Japan’s infatuation with robots seems to have changed little since Tezuka’s heyday.

A cultural difference between Japan and the West is sometimes offered as an explanation for Japan’s love of robots. “It’s probably true that Japanese people believe there is a soul in everything,” says Urasawa. “We don’t have any resistance to the



Robocon’s robo soccer (opposite page, top); Akazawa moves PLEN via Bluetooth-enabled cell phone (opposite page, bottom); Robocon robots duke it out (upper left); a page from Shogakukan’s *Pluto* manga (above); manga artist Naoki Urasawa (left).



gone, perhaps they feel they have some catching up to do. “I think some scientists are actually trying to create the future as Tezuka imagined it,” suggests Urasawa.

IN HIS OWN IMAGE

At the Advanced Telecommunications Research Institute International near Kyoto, one of Japan’s most ambitious humanoid robotics projects is underway. Professor Hiroshi Ishiguro is attempting to create an exact robot replica of himself—namely, an android.

In the laboratory a group of students sits around the professor’s double, as fifty “actuators” (pneumatic pumps) help Geminoid make a range of lifelike movements, including twitches, shrugs and simulated breathing. Meanwhile, Ishiguro himself sits in a nearby room where his lip movements are monitored by camera and computer, then relayed to his doppelganger who “chats” with the students in place of the professor. The robot is uncannily realistic, right down to the Ishiguro’s piercing stare and beetle brows.



Scary resemblance between Ishiguro Geminoid and creator (above); Ishiguro stares into computer camera to relay movement and gesture to his double, who then chats to students (center page); big-eyed robot from Ishiguro’s lab (opposite, upper right).

idea that even a machine might have a soul.” He suggests that in many parts of the West there is something unnerving about bringing the inanimate to artificial life; producing a Frankenstein or a Terminator. For Japanese people though, forging a living Astro Boy out of science and steel has a “romantic” appeal.

The fascination with fictional friendly robots applies as much to robot researchers as anyone. Many of today’s roboticists will have read Tezuka’s manga as children, notes Urasawa. Since Astro Boy’s fictional 2003 birthday has already come and

Ishiguro hopes to use the robot to study the human gaze and body language. Conventional experiments involving only humans are hindered by the fact that such actions are often unconscious. “Suppose we have a very human-like robot, it will be a controllable human,” explains Ishiguro. By developing interactive human-like robots researchers can study both robotics and human communication—a new discipline that Ishiguro has named android science.

Ishiguro’s robot is also an attempt to conquer the so-called Uncanny Valley—the name given to the strong unease caused by machines that look too human to be machines, yet not human enough to be people. Ishiguro says that his android is already realistic enough to escape the valley. “My students don’t want to touch the robot,” jokes Ishiguro, “though I don’t know what happens at midnight.” When a Geminoid predecessor was put on display at the 2005 International Exposition in Aichi, some old people apparently approached the android, bowed and asked, “Where’s the robot?”

LET ME ENTERTAIN YOU

But, research robots aside, how long will it be before humanoid robots actually start earning their keep? Could they do useful work in society? At the Japan Robot Association in Tokyo at least, such a science fiction future still seems far off. The organization is based right underneath Tokyo Tower in a building that might charitably be described as “retro-future.” An ancient standing fan turns lazily, and the only hint of any connection to anything high-tech is a small collection of toy robots waiting patiently on top of a bookshelf.

“Just because a robot is doing human work, doesn’t mean that the robot has to have human shape,” admits the association’s Shoichi Hamada. Nevertheless, “for cultural reasons”—namely Japan’s fascination with humanoids—two-legged robot partners have had the lion’s share of the media attention and research funds.

Since Japan has one of the most rapidly aging populations in the world, not surprisingly it is occasionally suggested that robots might one day take up some of the burden of a superannuated society. Robot caregivers are one possibility. “The tasks involved in care-giving are relatively fixed, like picking up and carrying old people,” Hamada points out. Likewise, since about 40 percent of the Japanese population is predicted to be over 65 by the middle of the century, the nation’s businesses might well appreciate a robotic hand. Government research projects have already explored how to use robots for dangerous or unpleasant industrial work such as working in nuclear plants or digging tunnels.

It’s a good bet though that the first humanoids to take a role in Japanese society will be entertainers rather than workers. Charismatic PR ‘bots



like Honda’s Asimo are already world-famous. One candidate to become the first affordable home humanoid is Takaratomy’s “Omnibot 2007: i-SOBOT”. The walking, talking ¥30,000 robot has 19 motors and a vocabulary of 200 words.

I CAN GET UP

But we may have to wait a while yet or the Japanese robotopia of a friendly, helpful humanoid in every home and workplace—50 years at least, suggests the Japan Robot Association’s Hamada. For one thing, robots are still far too slow and clumsy. Hamada points out that most large robots can’t even right themselves again when they fall over. And if they topple the wrong way, they are liable to injure themselves (or whatever is unlucky enough to be underneath them). Another major hurdle is robot intelligence. “At the moment robots are controlled by humans,” adds Hamada. “If they are really going to be capable of independent action, they need to think for themselves.”

If humanoid robot workers are going to emerge anywhere though, what better place than the world’s sole robot superpower? At the end of 2004, 42 percent of the almost 850,000 robots in use worldwide were in Japan. “If people need something, other people will work hard to develop that technology,” says Hamada confidently. “I am sure that useful humanoid robots will appear one day.”

