



***Mottainai* Thought and Social Acceptability of Robots in Japan**

Full Day Workshop on Roboethics

ICRA'07

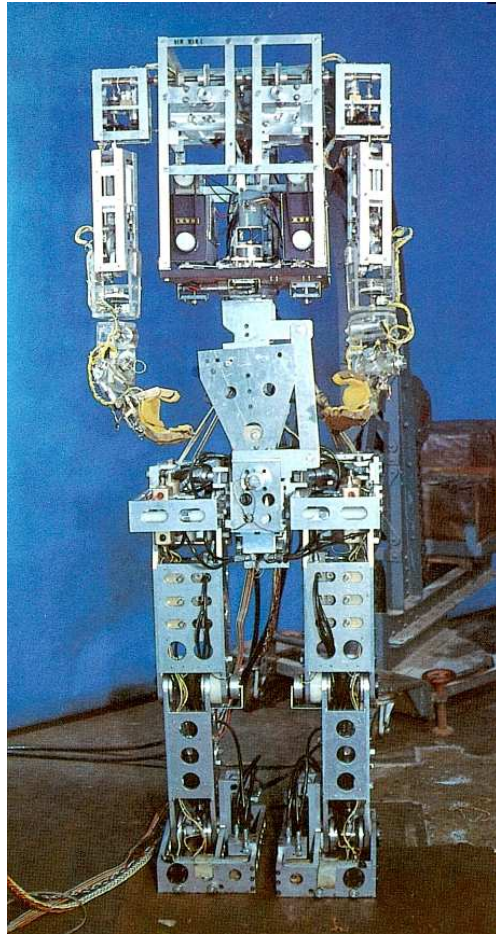
**2007 IEEE International Conference
on Robotics and Automation**

14 April 2007, Roma, Italy

Atsuo Takanishi 田中 敦雄

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Waseda's Achievements in Humanoid Robotics led by the late Prof. Ichiro Kato



Prof. Ichiro Kato (1925-1994)
WABOT-1 (1973)



WABOT-2 (1984)

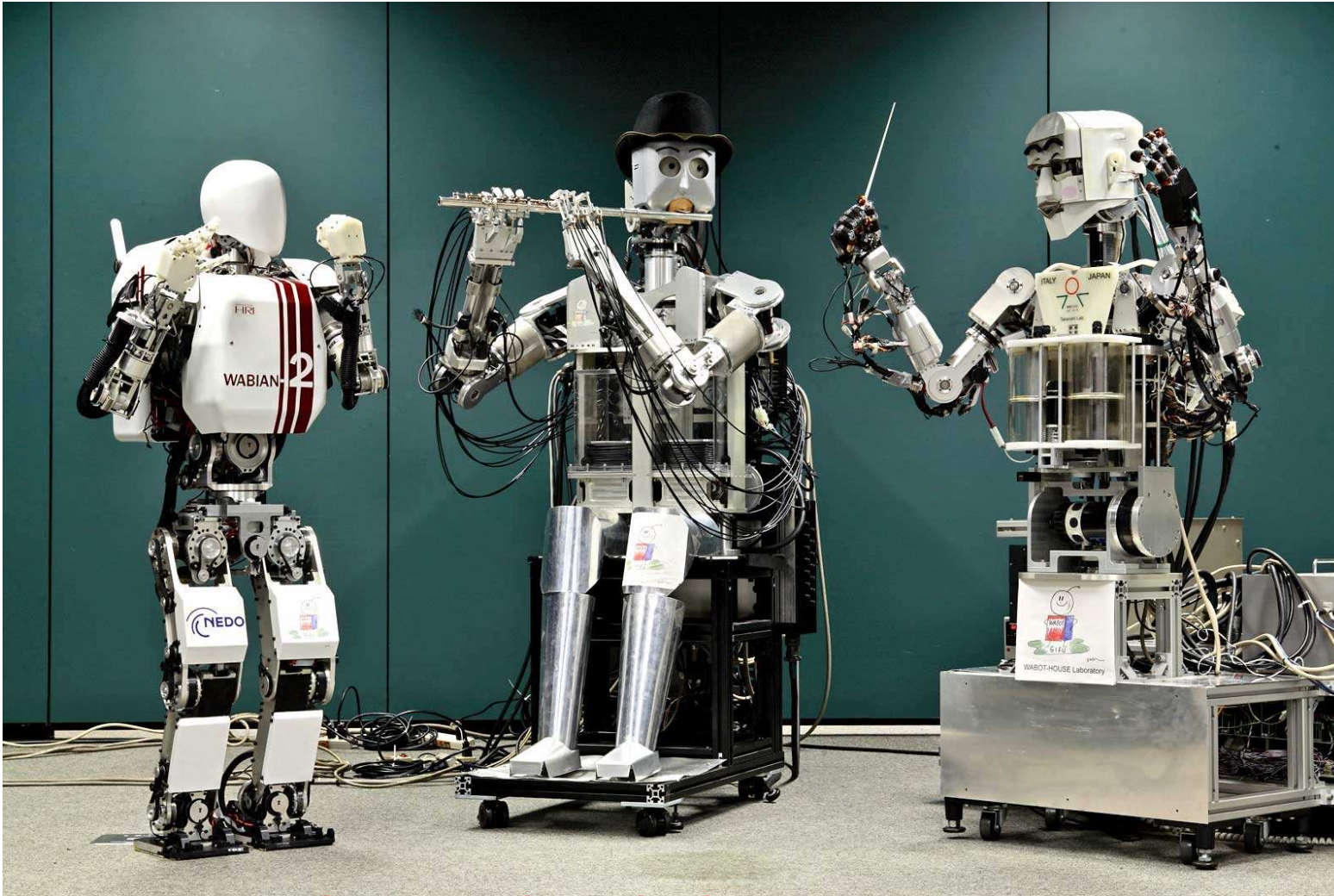


About Humanoid Robotics Institute, Waseda Univ.



- Established in April, 2000
- 8 Fulltime Professors and 10 Visiting Professors/Researchers including from Overseas
- More than 60 graduate students and post-doc researchers (More than 100 including undergraduates)
- More than 30 ongoing projects
- Organizing Humanoid Consortium
- Supported by: METI, NEDO, MEST, Gifu Pref., TMSUK, SANYO, SONY, HITACHI, NTT, NTT DoCoMo, OKINO, OSADA, ZMP, Fukuoka Pref., Fukuoka City, Niigata Pref.
- **RoboCasa**: SSSA-Waseda Joint Laboratory (2003/4/1)
- **Center of Excellence in the 21st Century in Robotics** [Show!](#) (2003/7)
- **Super COE on Advanced Science and Medical Care** (2004/7)

Not Bad, are those Humanoid Robots?



Waseda-Gifu WABOT-HOUSE Project from 2002



WABIAN-2R: Mechanical Motion Simulator of a Human



Human Like Knee-Extension
Walking □ with 50cm step
length

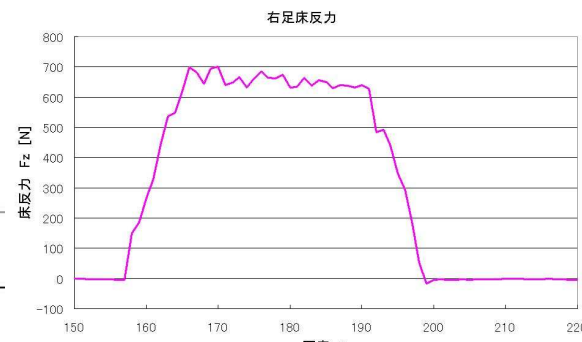
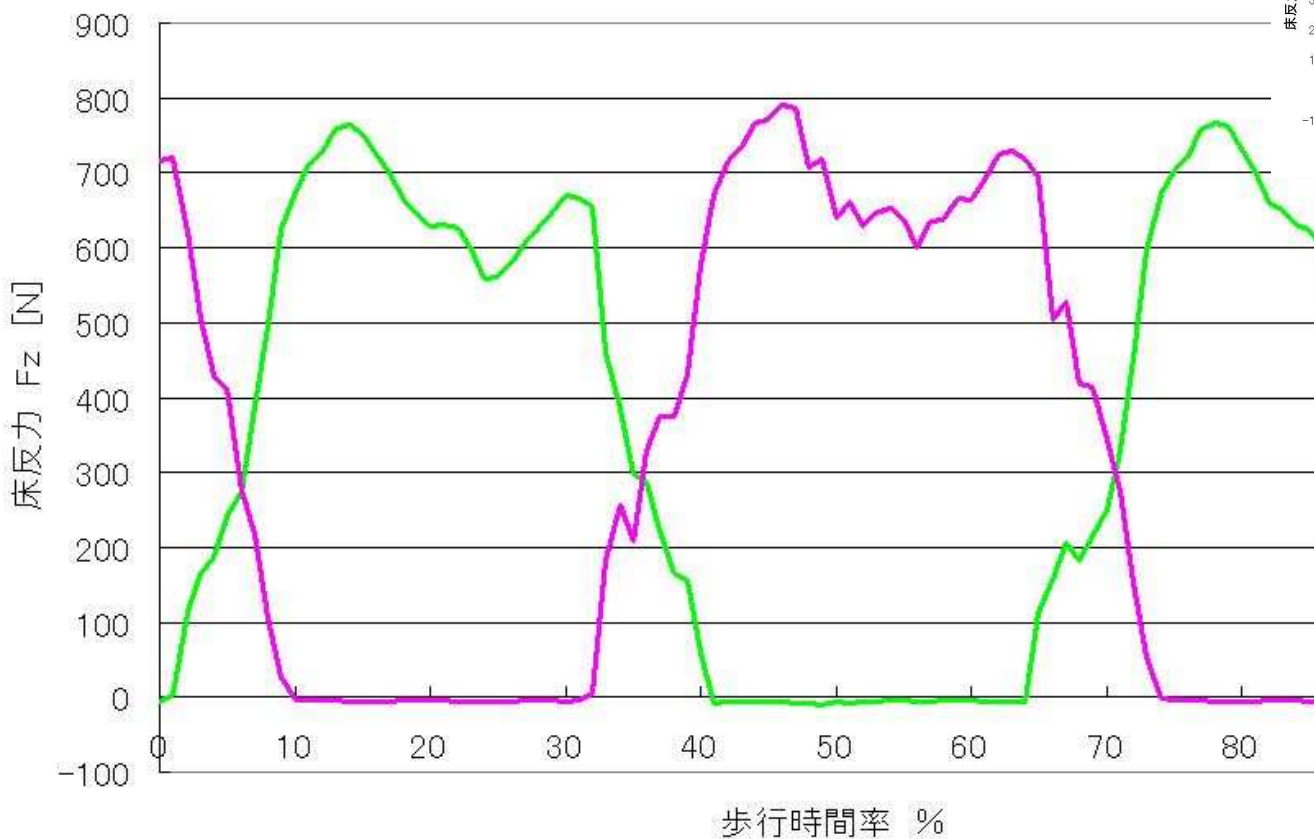


WABIAN-2R can walk outside

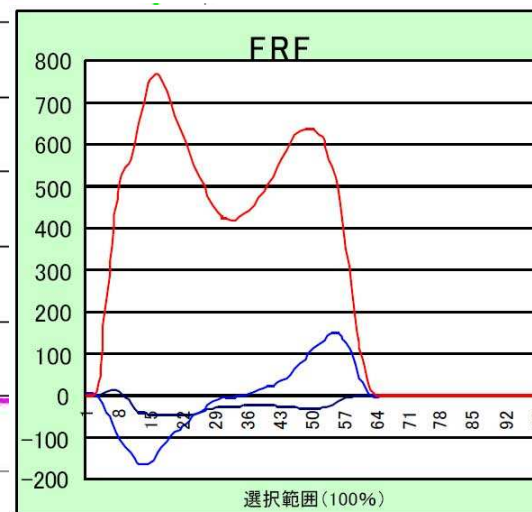


Human-Like Ground Reaction Force in Knee-Extension Walking

垂直床反力(2周期弱)



Knee-Bending Walking



Human Walking



WABIAN-2's Walking Assisted by Hitachi Walker for Elderly/Handicapped



Bending 0.2[m]



Knee stretched 0.2[m]

Real World Simulations of a human assisted by the Walker



Step Length: 0.32 [m/step] Step Cycle: Left Swing : 1.56 [s/step]
0.32 [m/step] Right Swing: 1.04 [s/step]



WABIAN-2R Goes to Streets, but Many Problems!



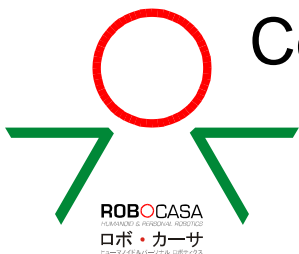
Special Economical Zone for Robot Test and Experiment in Fukuoka



Emotion Expression Robot: EYE-Chan



Trying to Add
Consciousness



Object-Emotion
Correlation Learning



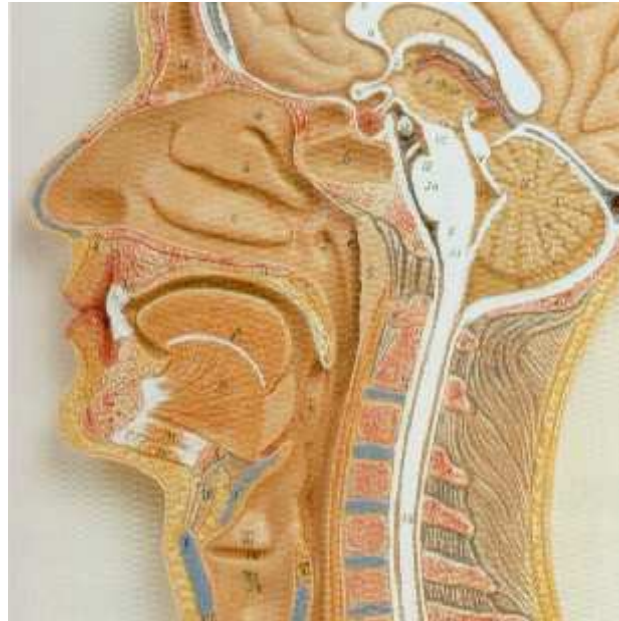
WF-4's Flute Play: The Flight of the Bumble-Bee (Rimsky-Korsakov)





Towards Vocal Humanoid Robot: WT-5

WASEDA UNIV.
HRI

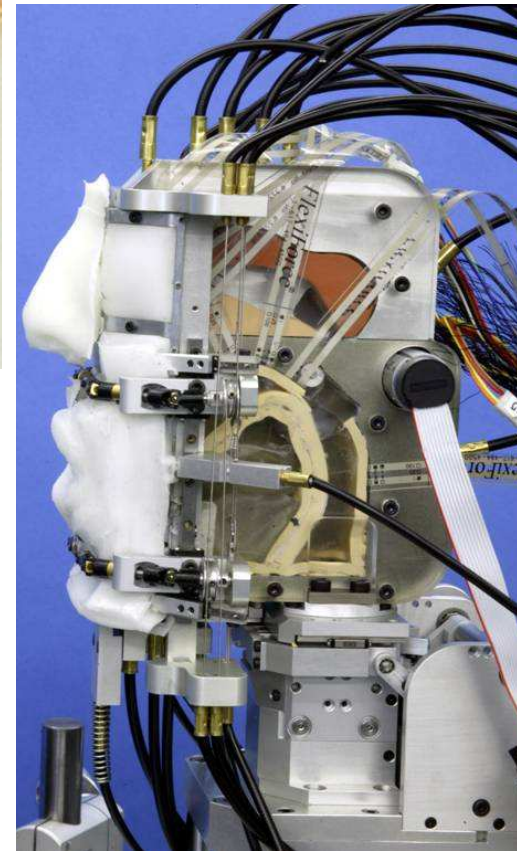


Human Vocal Organs

Kotaro Fukui Team

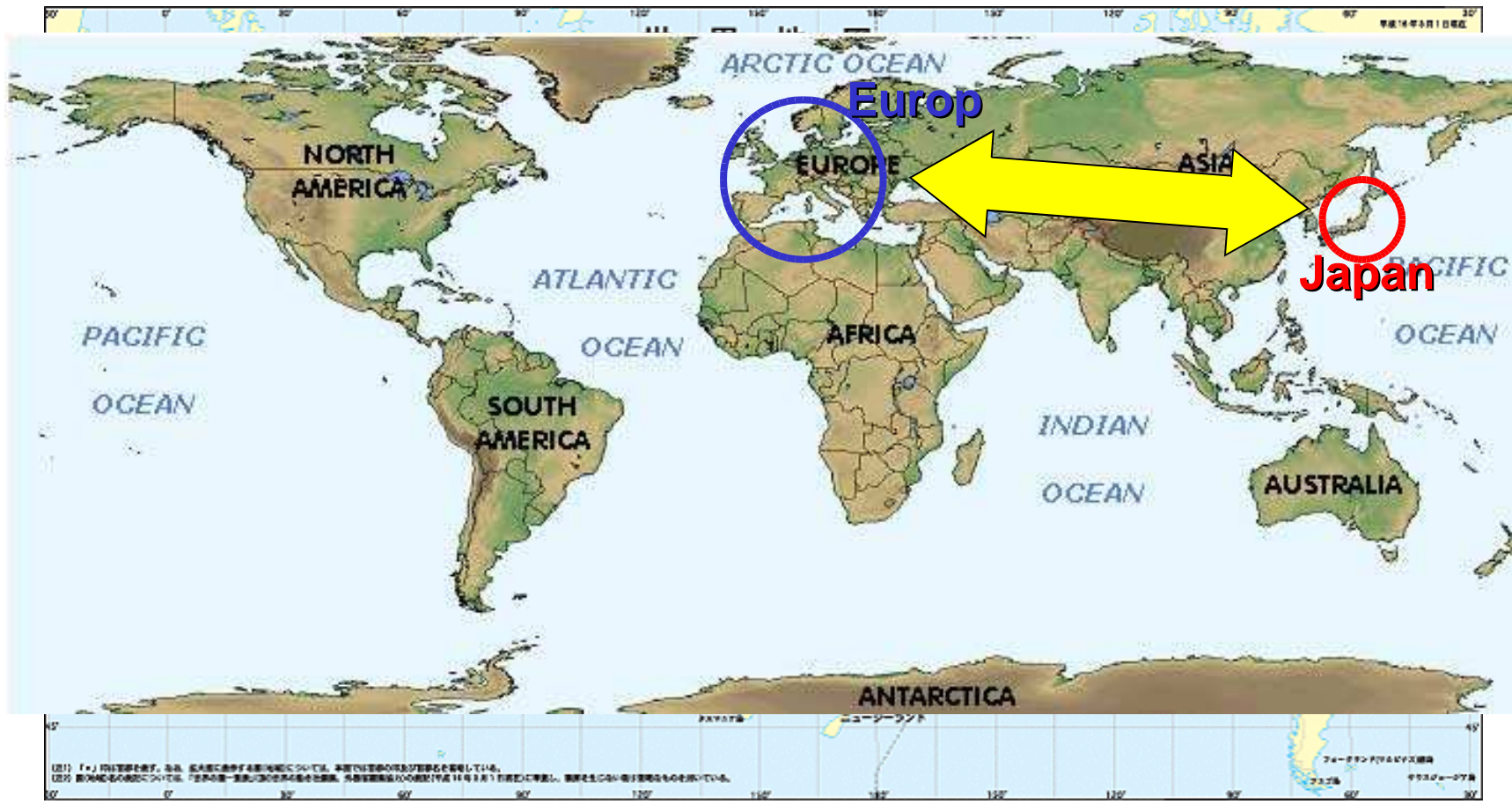
Jump!

Robot Vocal Organs



The Two Regions:

Far Away Each Other in Distance and in Culture

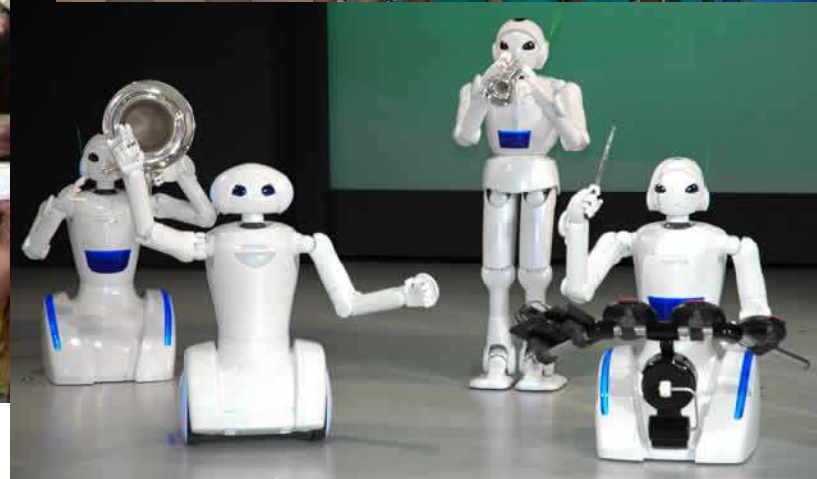


High Social Acceptability of Robots in Japan

- Acceptability of Humanoids/Animaloids
 - Feel/Accept Life-likeness through the Robots which Mimics Humans and Animals
- Social Acceptability depends on Religious and Cultural Backgrounds
 - Western Countries (Monotheism) and Japan/Asian Countries (Animism / Polytheism)
 - Organ Transplantations VS Artificial Organs
- Need of Social Systemic Preparation for Robot Acceptable Society
 - Change of Laws/Regulations to Accept Robots (*Special Zone for Robot Test and Experiments in Fukuoka*)
 - Licensing/Insurance System
 - Black Chip (Black Box) for Better Life with Robots

AICHI EXPO '05 :

The Historically Biggest Robotic Event in Japan



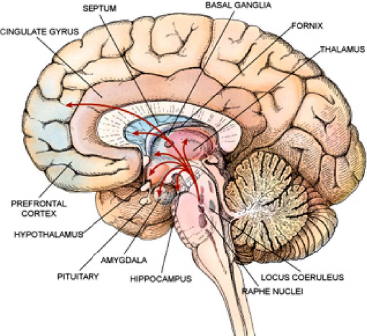



Recent Humanoids and Animaloids for Human Environment in Japan

- TOYOTA: **Partner Robots Performed in Aichi EXPO '05**
- SONY: AIBO, SDR-3X (3 years of secret collaboration with Takanishi Lab.), SDR-4X, QRIO
- HONDA: P2, P3, ASIMO
- MITI: HRP-1, HRP-2
- TMSUK/SANYO: T-4, T-5, Banryu-Series (SANYO)
- Kitano Project(ERATO): PINO, PINO2, Morph, etc.
- NEC: R100, PaPeRo
- Mitsubishi Heavy Industries: Wakamaru
- ATR/MHI: Robovie, Robovie-2, Robovie-3
- HITACHI, Etc.

*Differences in Sound Processing in the Brain:

Is Nature a friend to Japanese not to Europeans?

	<p>Left Brain (Linguistic Brain)</p> <p>Logical/ Sequential/ Rational/ Analytical/ Objective/ Looks at parts</p>	<p>Right Brain (Musical Brain)</p> <p>Random/ Intuitive/ Holistic/ Synthesizing/ Subjective/ Looks at wholes</p>
<p>Music/ Musical Instruments/ Machine Sounds/ Noise</p>	<p>-----</p>	<p>Europeans Japanese</p>
<p>Listening to Someone's Talk or Speech</p>	<p>Europeans Japanese</p>	<p>-----</p>
<p>Vowels/ Crying/ Laughing/ Insects/ Animals/ Waves/ Winds/ Rain/ Streams/ Japanese Musical Instruments/</p>	<p>Japanese</p> 	<p>Europeans (Other Asians)</p>

* By Prof. Tadanobu



Onomatopoeia: Japanese Like to Linguistically Express Nature and Mental Conditions?



- Japanese' 12,000 Onomatopoeias VS 3,000 English ones:
 - ぶらぶら (bura-bura)-loiter/lounge/ramble/roam/stroll ちょこちょこ (choko-choko)-**trot**/**waddle** だただた (dota-dota)-lumber/stomp/tramp どしんどしん (doshin-doshin)-stomp/tramp/**trot** のろのろ (noro-noro)-loiter noso-noso)-lounge のっそのっそ (nosso-nosso)-lumber すたすた (suta-suta)-hurry せかせか (seka-seka)-**trot** てくてく (teku-teku)-tramp/trudge とぼとぼ (tobo-tobo)-plot/trudge よちよち (yochi-yochi)-toddle/totter/**waddle** よたよた (yota-yoya)-stagger/**waddle** よろよろ (yoro-yoro)-stagger
- Mental Conditions
 - ドキドキ (doki-doki), ハラハラ (hara-hara), ガクガク (gakkuri), スッキリ (sukkiri), サッパリ (sappari), ウジウジ (uji-uji), ネットチリ (netchiri), ヒヤヒヤ (hiya-hiya), イライラ (ira-ira), イキイキ (iki-iki), ビクビク (bikkuri), シクシク (shiku-shiku), ビクビク (biku-biku), サバサバ (saba-saba), キップパリ (kippari), ジクジク (jikkuri), キッチリ (kitchiri), ミッチリ (mitchiri), チマチマ (chima-chima), シンミリ (shin-miri), etc

Buddhist Gods



Human Gods



Ieyasu Tokugawa



Michizane Sugawara



Animal Gods or Messengers

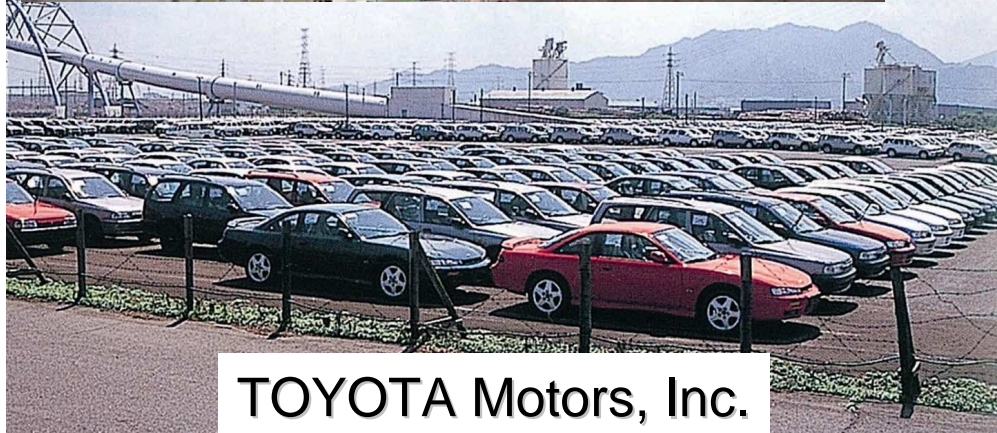


Fujin/ 風神 /God of Winds and Raijin/ 雷神 /God of Thunders



Korin Ogata/ 大岡 政房 (1658-1716)

Shinto Alters in Factories to Pray for Safety



TOYOTA Motors, Inc.



KANEBO, Inc.

Shinto and Buddhism Pray and Amulets for Car Safety

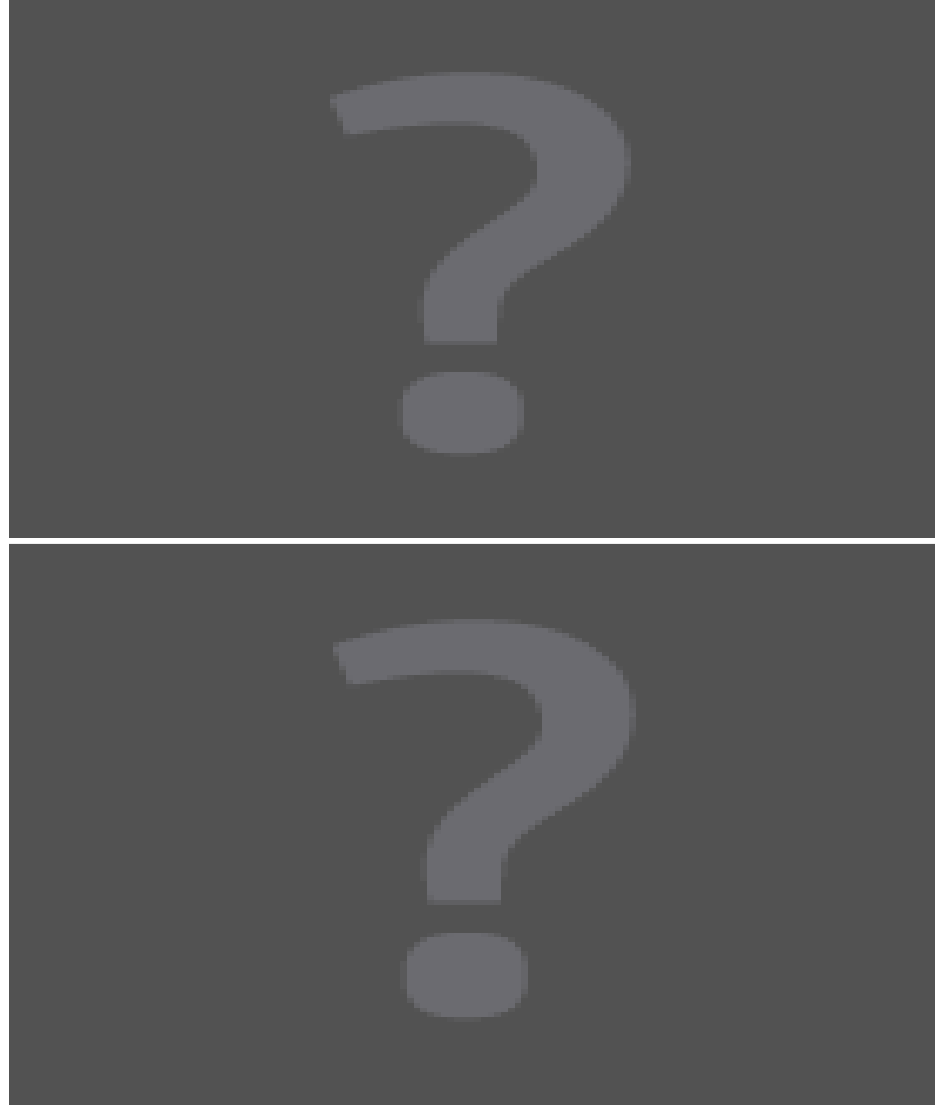


The Samurai Humanoid **KIYOMORI**:

A Brother of WABAIN-2 Visited Munakata Shrine Prayed for the Safety of All the Robots in the World



Biped Robot That Can Carry a Human: WL-16 (Collaboration with TMSUK)





WL-16 Becomes to Carry Everyone

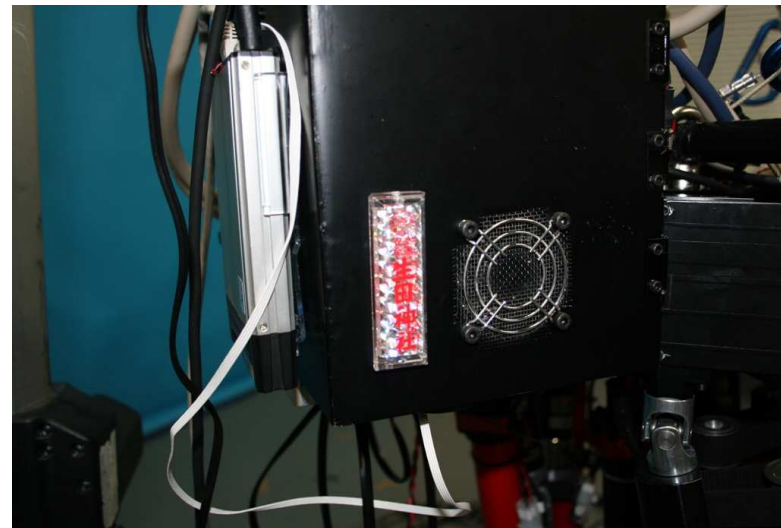
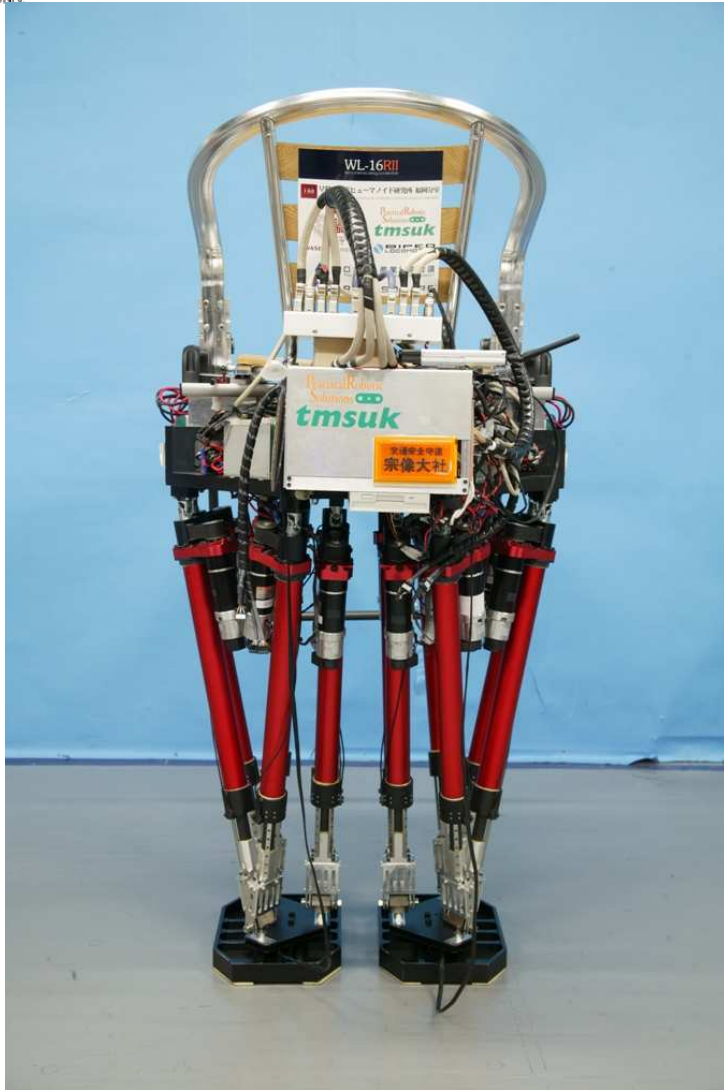




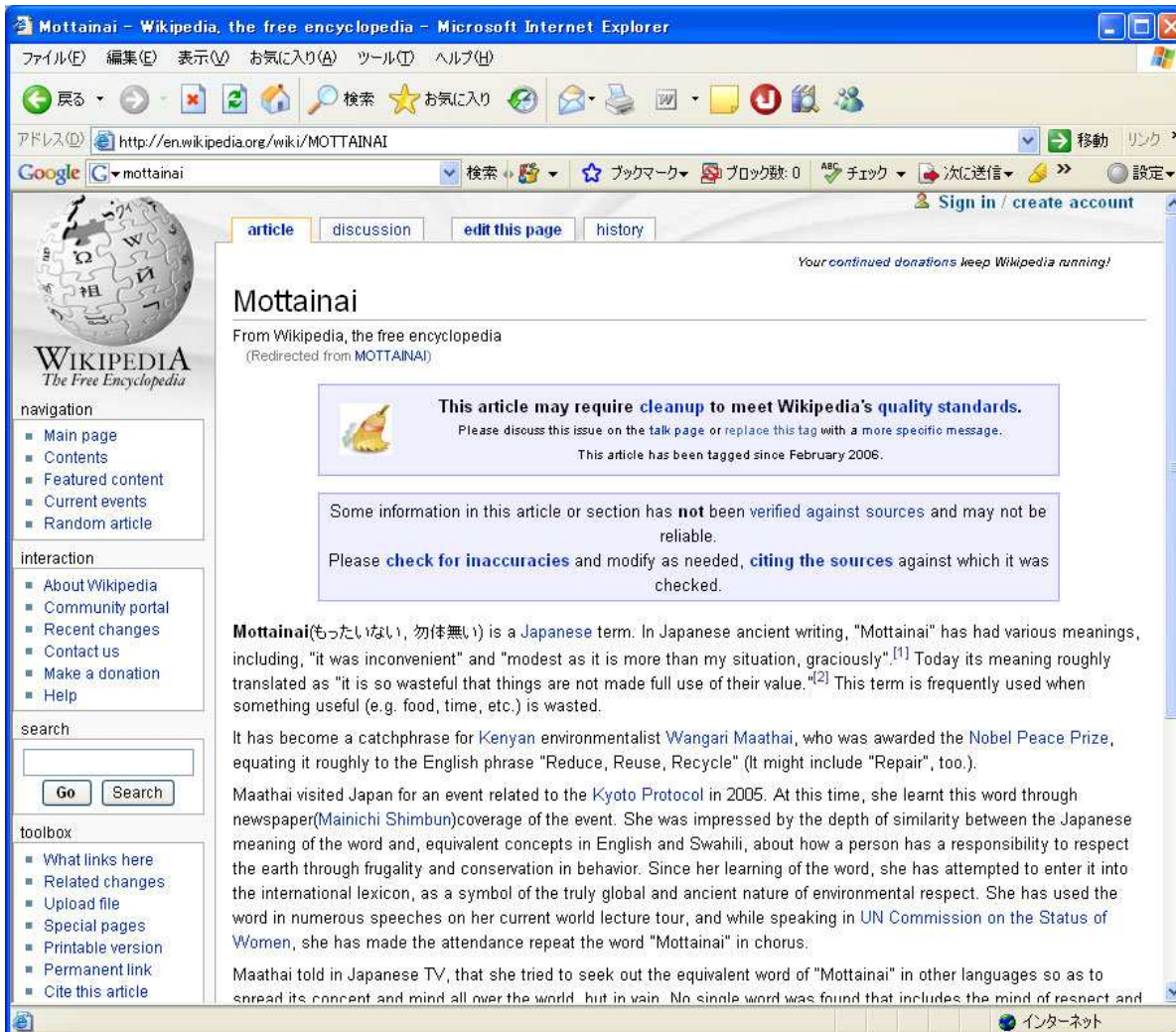
WL-16 Even Carries the President of TMSUK!



WL-16 also Puts Safety Amulet

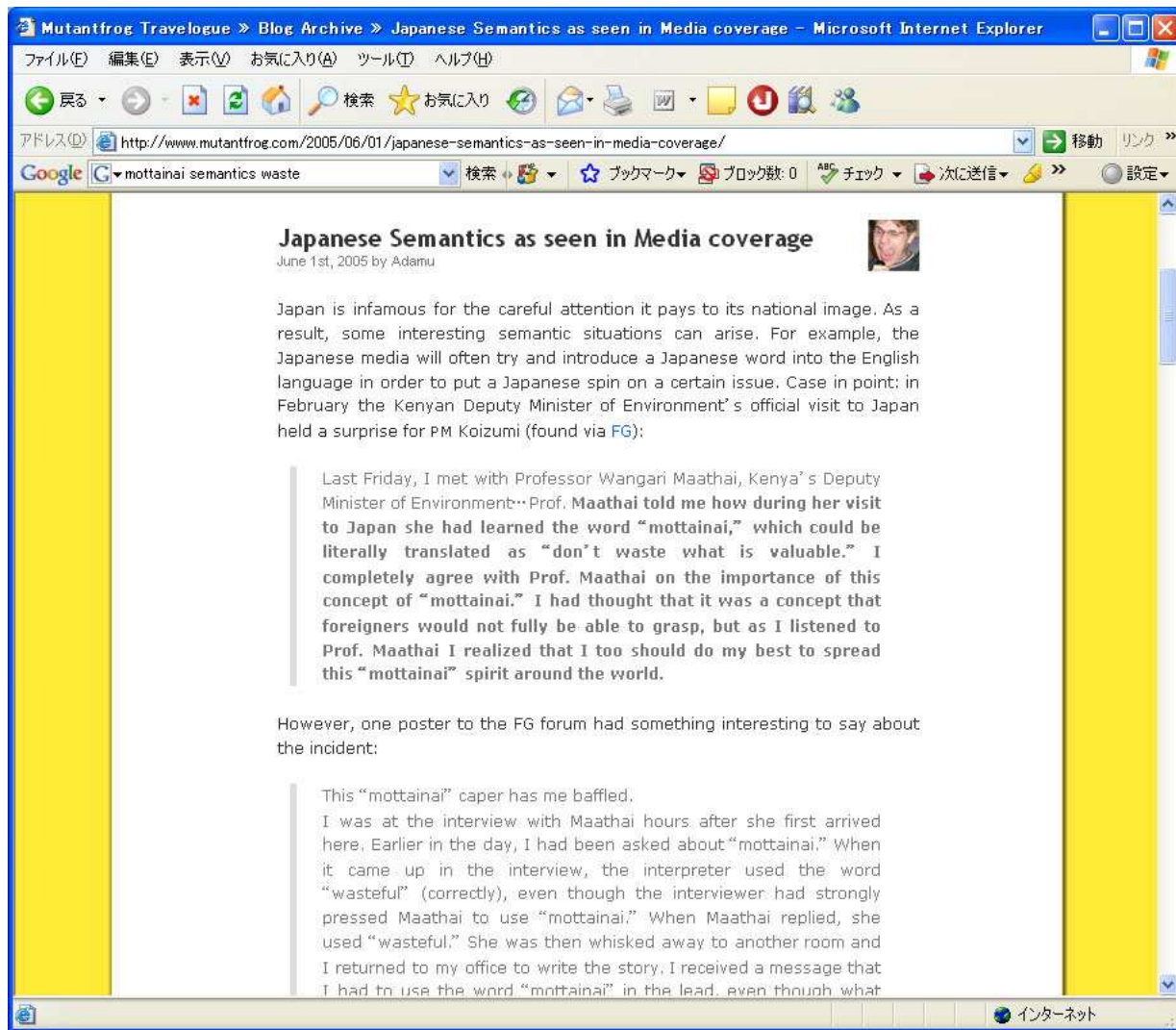


Mottainai(もったいない) : 3R = Reduce+Reuse+Recycle



Wangari Muta Maathai (born April 1, 1940) was born in Ithi village, Tetu division, Nyeri District of Kenya. Maathai is an environmental and political activist. In 2004 she was awarded the Nobel Peace Prize for "her contribution to sustainable development, democracy and peace"—the first African woman to receive the award.

Some Criticisms: Mottainai = Waste!



When I first heard that Kenyan say that, all I could think of was... YOU TWAT! As if a few new words suddenly shed an entirely new cultural insight into something! Mottainai— 無駄— is nothing special, it's just an expression the same as "What a waste" in English. There is no deep, spiritual, East Asian meaning to the word. Enough already!

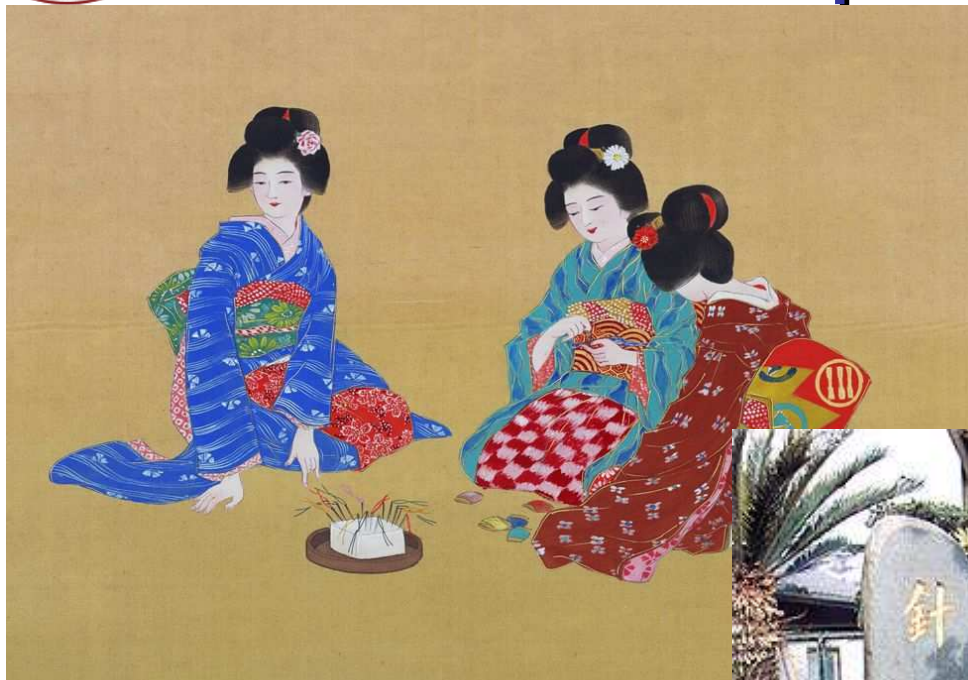
Certain Japanese people need to learn that they're not going to score any points in the world by trying to force lame, propagandistic terms into the English language.



No!, because *Mottainai* >> Waste

- Japanese treat anything in the universe as if it has a soul inside which may have strong relations to the fact that Japanese use the left brain for natural sound recognition and have large vocabulary of onomatopoeias.
- We cannot treat them less worthily (rudely / roughly / impolitely) or even too-worthily (too-goodly / too-muchly) because we are no more than they are and even some of them become a god.
- We say *Mottainai* if someone treats them rudely / roughly / impolitely or even too-goodly / too-muchly.
- *Mottainai* is something much more than Waste to Japanese which makes the society to be highly ecological and highly friendly to anything including artificial ones.

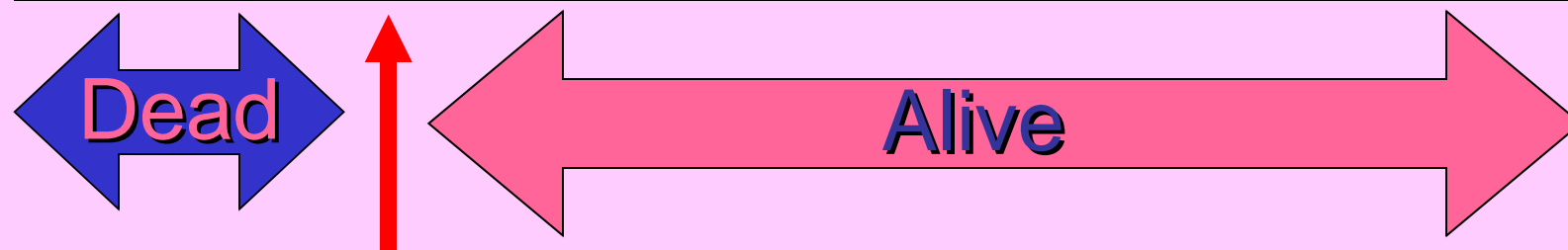
Requiem Service for Broken Needles in Japan



Dead or Alive?

Europeans

Good for Organ Transplantation



Japanese

Good for Artificial Organ

Special Zone for Robot Test and Development in Fukuoka:

Change of Traffic Law Enabling Robots to Move on Public Roads



©福岡市・福岡電力.



□□□□□□ next are for Easy Usage of Radio Waves for Robots
and for Robotic Medicine, etc.

Robot Experiments in the Special Zone for Robot Test and Development in Fukuoka



**The Law Extends Nation Wide Approved
by Japanese Parliament on March 29,
2005.**

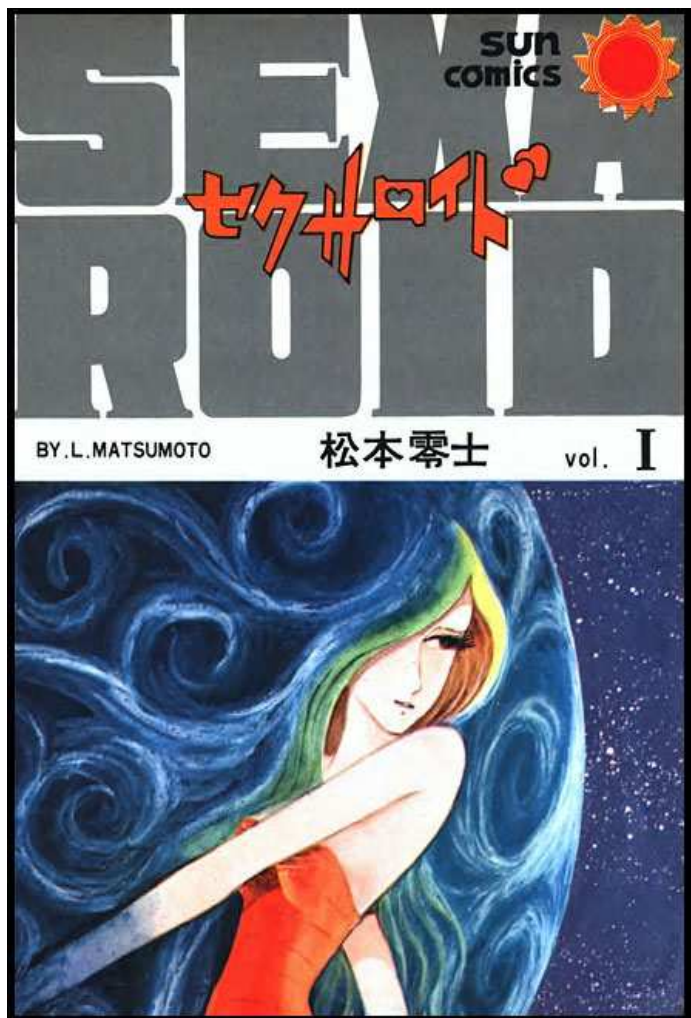


SF Manga Writer Reiji Matsumoto

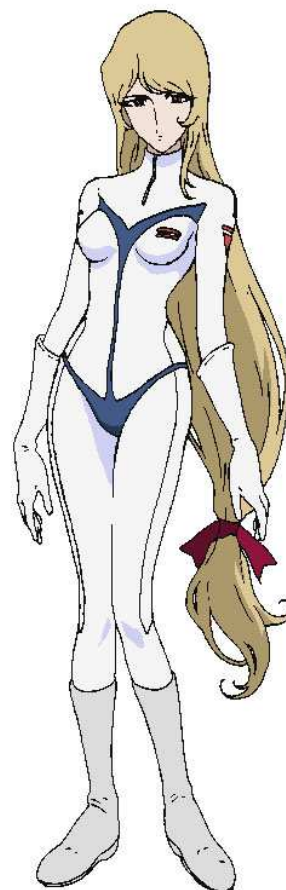


Reiji Matsumoto

Bad, are those Humanoid Robots? Sexaroid = Robot + Sex



Manga Sexaroid from 1968



©2003 松本零士 / プラネット・銀河鉄道管理局



Commercial Figure sold in AKIBA

Sexdolls may become Sexaroid? Maybe, Most Considerable Ethical Problem in Japan?

Too much dependency of young Japanese on those robots
may break their healthy mental development to be an adult.

オリエント工業ホームページへようこそ! - Microsoft Internet Explorer

アドレス http://www.orient-doll.com/top.htm

ORIENT INDUSTRY
オリエント工業

最新情報 製品一覧 よくある質問 カタログ リンク ホーム
ギャラリー サイトマップ 会社情報 ショールーム 問い合わせ

創業30周年記念
スプリングキャンペーン実施中

ブチジョシリーズ
ソフビ製/身長140cm
ご購入の方対象

開催期間 3月22日～5月6日

「ドールとの新生活」を始めてみませんか?

Jewel Rosa
ジュエルローザ

より親密な愛人形との生活をあなたへ

トピックス

- 3月22日～5月6日の間、キャンディーガールブチソフト【ナノ】・【ピュア】をご購入の方にキャッシュバッククーポンをプレゼントいたします。詳しくはこちらをご覧ください。
- 最新情報にマスメディア掲載情報を2件追加しました。詳しくはこちらからどうぞ。
- 「サモザンケット」の紹介ページを追加いたしました。癒しのひとときを暖かく演出するアイテム。詳しくはこちらからどうぞ。
- 「オリエント工業の歴史」のページを更新致しました。「ジュエルローザ」まで網羅したものになっております。詳しくはこちらからどうぞ。なお、それに合わせてトップページのフラッシュも更新いたしましたのでご覧ください。
- 「サモザンケット」が「ジュエルローザ」「ジュエル」「ジュエルライト・ライトF」「ブチジュエル/ブチジュエルF」と同時購入でお得になります。詳しくはこちらからどうぞ。

株式会社ココロ アクトロイドDER2 - Microsoft Internet Explorer

アドレス http://www.kokoro-dreams.co.jp/robot/act/der2.html

Contents

- 動刻・ロボット
- 特注製作
- イベントプロデュース・レンタル
- アクトロイド

圧倒的なリアルさ、究極の表現力で魅了する、最先端の人体型ロボット「アクトロイド」。続々ラインナップ。

アクトロイド-DER
レンタルオファー受付中

アクトロイド-DER2
アイドル系ロボット

アクトロイドヒストリー
開発の歴史と現代アクトロイド
たちを紹介

アクトロイドギャラリー
あらゆるシチュエーションでお役に立てる
アクトロイド

ショップロボット(自販機)
アミューズメントアイテム
物販
開発情報
海外での活動
ココロニュース

Movie Theater ムービーシアター

動刻・ロボット アニマトロニクス

ACTROID DER2
アクトロイド DER2

DERの妹となる『アクトロイド-DER2』は
圧倒的なリアルさや高性能に磨きをかけて、
さらにかわいさアップ!

レンタルオファー受付中

嬉しい、常きに溢れたアイドル系ロボットの誕生です。
スリ足長自慢のナイスボディで、明るい笑顔がチャー
ムポイント。

ハーフを思わせる表情豊かな顔はびっくりするほどの小
顔を実現。
もちろん、女の子らしいキュートな動きにも磨きがかかり
ました。

かわいくてもナレーションはしっかりこなす実力派。司会
やご案内はもちろん、スタイルを生かしてモデルもOKで
す。

皆様のオファー、お待ちしております。