



Humanoid Robotics, Culture and Society of Japan

Afternoon Session: "ROBOTICS & BEYOND"
THE OPENING CONFERENCE
EURON Atelier on Roboethics 2006

Palazzo Doria Spinola
Genova, Italy
February 27, 2006

Atsuo Takanishi (高西淳夫)
Dept. of Mech. Eng./Humanoid Robotics Institute, Waseda University



Genova! Genova! Genova!



Japanese "Repubblica Marinara," Hakata/Fukuoka



WABIAN-2's Demos Done in Expo 2005 Aichi Japan



Human Like Knee-Extension Walking with 50cm step length



Conventional Knee-Bending / Hip-Sinking Walking

105th ANNIVERSARY WASEDA UNIVERSITY HRI

Emotion Expression Robot: EYE-Chan

Trying to Add Consciousness

Object-Emotion Correlation Learning

ROBOCASA

105th ANNIVERSARY WASEDA UNIVERSITY HRI

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

105th ANNIVERSARY WASEDA UNIVERSITY HRI

Towards Vocal Humanoid Robot: WT-5

Robot Vocal Organs

Human Vocal Organs

Kotaro Fukui Team



Jump!

105th ANNIVERSARY WASEDA UNIVERSITY HRI



The Two Regions: Far Away Each Other in Distance and in Culture


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.


Why Japanese Like Humanoid Robots Including Me?


- History?
- Religion?
- Culture?
- Society?
- Etc.


***Differences in Sound Processing in the Brain:**


Are Natures friends to Japanese not to Europeans?

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

* By Prof. Tadanobu Tsunoda (1970's)

ONOMATOPOEIA: Japanese Like to Linguistically Express Natures and Mental Conditions?

- Japanese' 12,000 Onomatopoeias VS 3,000 English ones*:
 - ぶらぶら(burabura)-loiter/lounge/ramble/roam/stroll , ちょこちょこ(chokochoko)-trot/waddle , どたどた(dotadota)-lumber/stomp/tramp , どしんどしん(doshindoshin)-stomp/tramp/trot , のろのろ(noronoro)-loiter , のそのそ(nosonoso)-lounge , のっそのっそ(nossonoso)-lumber , すたすた(sutasuta)-hurry , せかせか(sekaseka)-trot , てくてく(tekuteku)-tramp/trudge , とぼとぼ(tobotobo)-plot/trudge , よちよち(yochiyochi)-toddle/totter/waddle , よたよた(yotayoya)-stagger/waddle , よろよろ(yoroyoro)-stagger
- How AIBO Walks?
 - とことこ(tokotoko) , てくてく(tekuteku) , ういーん(ueen) , かたかた(katakata) , よちよち(yochiyochi) , かしゃかしゃ(kaysakasya) , , , 等々(etc)

* By Prof. Ikuhiro Tamori(2000's)

Historical Backgrounds (Simplified History of Japan)

One Continuous Dynasty by One Imperial Family	BC 660 - Shomu	Jyomon & Yayoi Era	
	AD -1095	Nobles Era	Kyoto/Nara
	1095 -1600	Samurai Era	Portuguese came to Tanegashima
	1600 -1867	Edo Era	Cultural Explosion (Japan's Renaissance) Karakuri/ Sushi/ Manga/ Ukiyo-e/ Kabuki/ Haiku/ Bonsai/ Tea Cer./ Hanami/ Kendo/ Judo/ Karate
	1867 -1989	Meiji Era	J. vs China/Russia Wars
		Taisho Era	WW1
		Showa Era	WW2 / Manga & TV Anime Industrial Robots
1989 -	Heisei Era	Social Robots	

Origin of Manga in the 12th C: Japanese' Nature of Humanizations



(Chyo-Jyu-Giga 12C to 13C)

Japan's Renaissance: Manga & Ukiyo-e in Edo Era





Manga & Ukiyo-e in Edo Era:
 Ordinary People Enjoyed Reading
 Mangas Using a Lot of **Onomatopoeias**



Manga & Ukiyo-e in Edo Era



Manga & Ukiyo-e in Edo Era



Manga & Ukiyo-e in Edo Era



125th ANNIVERSARY WASEDA UNIVERSITY HRI

Manga & Ukiyo-e in Edo Era

125th ANNIVERSARY WASEDA UNIVERSITY HRI

Karakuri Puppets in the 17C/18C (Automatic Type/Indoor Karakuri)

Shogun Only Allowed Development of Entertainment Technology

Sanbansou Doll 座敷からくり Tea Serving Doll

125th ANNIVERSARY WASEDA UNIVERSITY HRI

Karakuri Puppets in the 17C/18C (Tele-Operated Types/Outdoor Karakuri)

山車からくり

Inuyama, Aichi (17th Century-)

125th ANNIVERSARY WASEDA UNIVERSITY HRI

Karakuri Puppets in the 18th Century (Tele-Operated Types)



Japan's Karakuri Books: Educated Many Ordinary People in Edo Era

WASEDA UNIV.
HRI

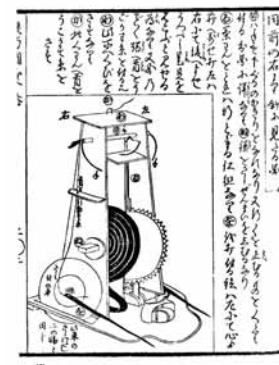


磯訓蒙鑑草:多賀谷環中仙(1730年)



Japan's Karakuri Books: (Know-How/Hobby Book)

WASEDA UNIV.
HRI



機巧図彙:細川半蔵(1796年)



Walt Disney's Animation Movies Became Popular in Japan After WW II

WASEDA UNIV.
HRI



Walt Disney's animations strongly affected Osamu Tezuka who made the first TV animation titled "ASTRO BOY" in which a boy humanoid robot is the hero, in the world.



The Birth of Japanimation:

WASEDA UNIV.
HRI

- Tetsuwan Atom / Astro Boy
 - Autonomous Humanoid
 - Emotion
 - Human Size
 - In the 21st Century
 - Has Family (Father, Mother, Brother, Sister)
 - Fights for Justice



- Tetsujin 28 / Iron Man the 28th
 - Tele-Controlled Humanoid
 - No Emotion
 - Giant Size
 - In the '50s to '60s



105th ANNIVERSARY WASEDA UNIVERSITY

WASEDA UNIV. HRI

Astro Boy (1951/2~)

105th ANNIVERSARY WASEDA UNIVERSITY

WASEDA UNIV. HRI

Iron Man the 28th (1956~)

105th ANNIVERSARY WASEDA UNIVERSITY

WASEDA UNIV. HRI

Waseda's Achievements Inspired by the late Prof. Ichiro Kato

Prof. Ichiro Kato (1925-1994)

WABOT-1 (1973)

WABOT-2 (1984)

105th ANNIVERSARY WASEDA UNIVERSITY

WASEDA UNIV. HRI

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)**



High Social Acceptability of Robots in Japan

WASEDA UNIV.
HRI

- 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



Golem, a Humanoid Robot in the Modern Age(?), is an Dangerous Creature in Europe

WASEDA UNIV.
HRI



Golem was made of soils (High Tech. Metals and Silicon Chips) and was activated by incantations (Computer Programs)?



Requiem Service for Broken Needles in Japan

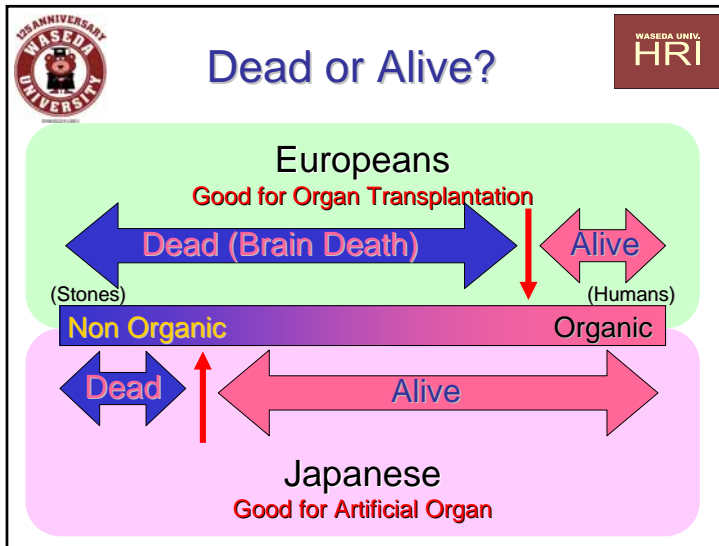
WASEDA UNIV.
HRI



The Samurai Humanoid KIYOMORI: A Brother of WABAIN-2 Visited Munakata Shrine Prayed for the Safety of All the Robots in the World

WASEDA UNIV.
HRI





WASEDA UNIVERSITY HRI

Beyond Ethics: もったいない思想
(Mottainai Thoughts)