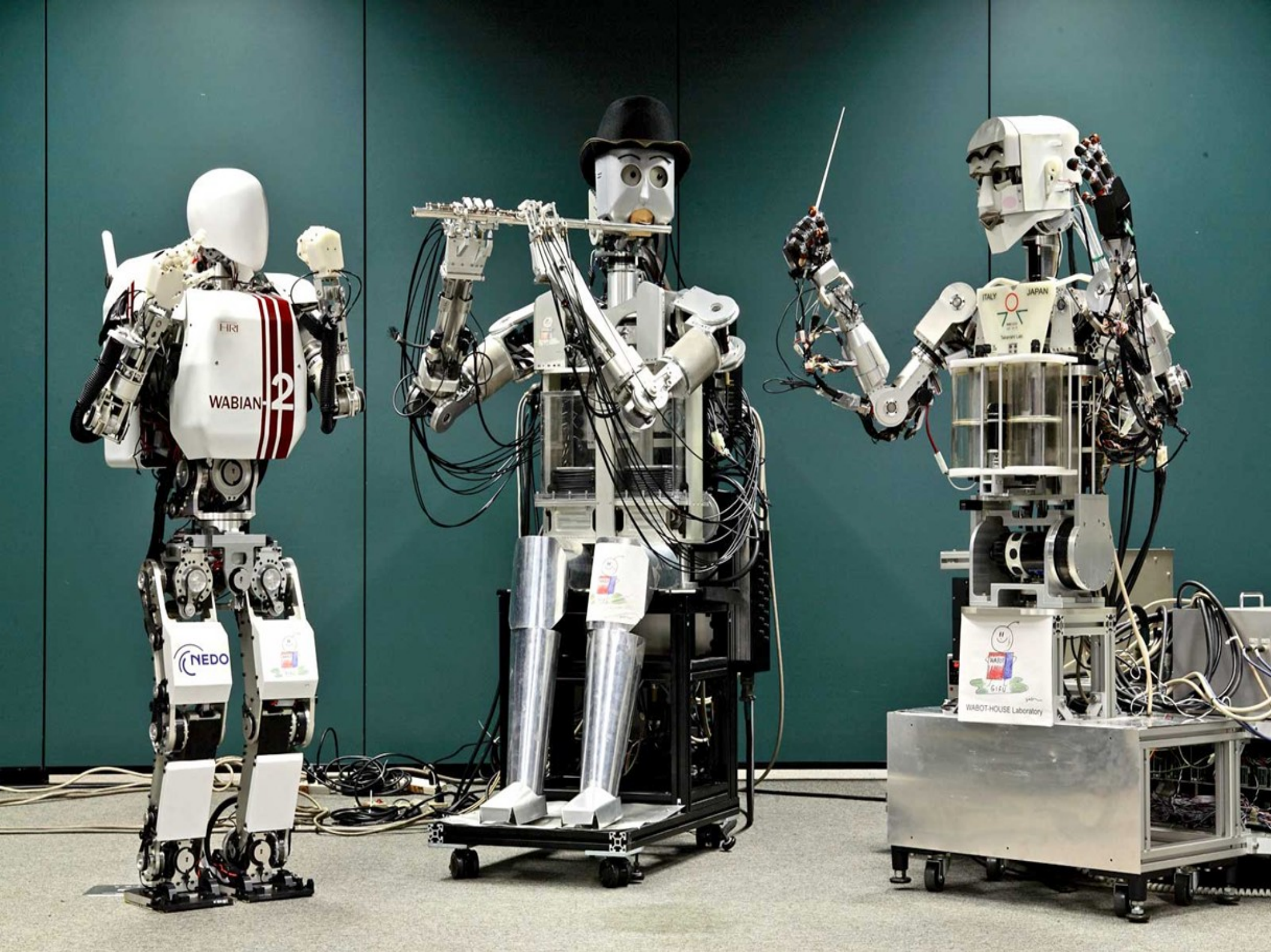
TECNOETICA

INGENIERIA 2010
ARGENTINA
Congreso Mundial y Exposición
17-20 Octubre 2010 | Buenos Aires

José M. Galván
Pontificia Università della Santa Croce
ROMA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NEDO
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WABOT-HOUSE Laboratory


PREDATOR B

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noi, sui nostri mezzi di comunicazione di ma
descriviamo questa tecnologia come «precisa»
costo ridotto», un importante quotidiano del Pa
stan ha dichiarato che gli Stati Uniti sono «il ne
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ni. La parola «drone» è diventata di uso comun
urdu, la lingua nazionale del Pakistan, e com
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rica di non combattere con onore. La q
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si chiede chi deve essere chia
to a rispondere quando succ
qualcosa di sbagliato. Le vi
me civili, a seconda delle
me, sono state tra 200 e 10
Ma in molti casi questi in
denti sono accaduti nelle v
nanze di alcuni dei più peri
losi capi terroristici del mon
Dove va tracciato il confine?
Il significato dell'espressi
«andare in guerra» sta cambi
do anche per il singolo solda
Partire in battaglia significa
sempre che il soldato potrebbe n
tornare più. Achille e Ulisse pres
il mare per andare a combattere co
Troia. Mio nonno si imbarcò per comb
tere contro i giapponesi dopo l'attacco a Pe
Harbour. La guerra a distanza ha cambiato tu
Un numero sempre maggiore di soldati si alza
mattina, va al lavoro in automobile, si siede dav
ti allo schermo di un computer e usa sistemi robo
ci per combattere insorti lontani 11.300 chilome
E alla fine della giornata «di guerra» risale in m
china, torna a casa e, per dirla con le parole di
ufficiale dell'aeronautica: «In venti minuti sei a
na a chiacchierare con i bambini». La parte più
schiosa della giornata non è la battaglia, ma il p
corso in macchina tra casa e ufficio.

Questa disconnessione dal campo di battag


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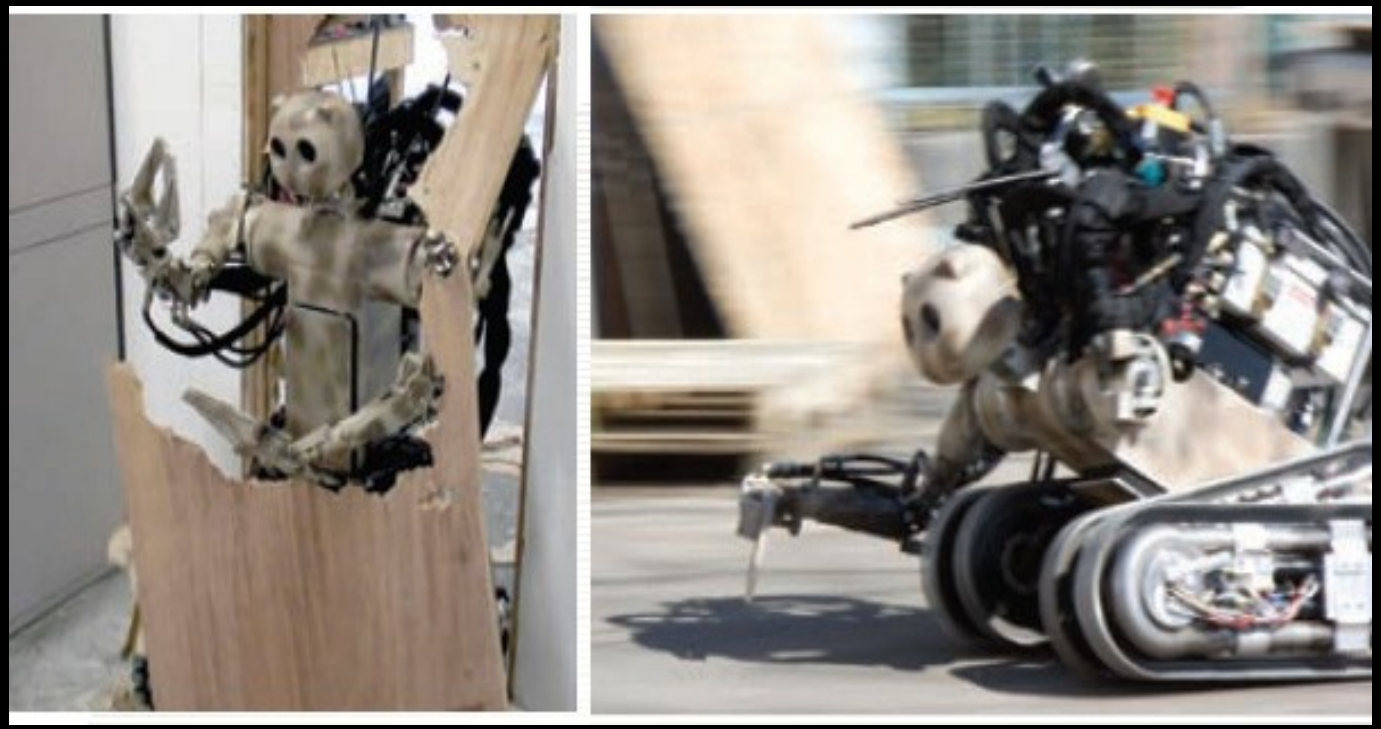



VECNA ROBOTICS

scuola superiore Sant'Anna
di studi universitari e di perfezionamento

Nell'ambito del corso di Biomeccanica della Scuola Superiore Sant'Anna
e del Corso di Laurea in Ingegneria Meccanica dell'Università di Pisa si terrà il Seminario dal titolo:

"Il legame uomo-tecnologia: aspetti teologici"

Il Seminario sarà svolto dal

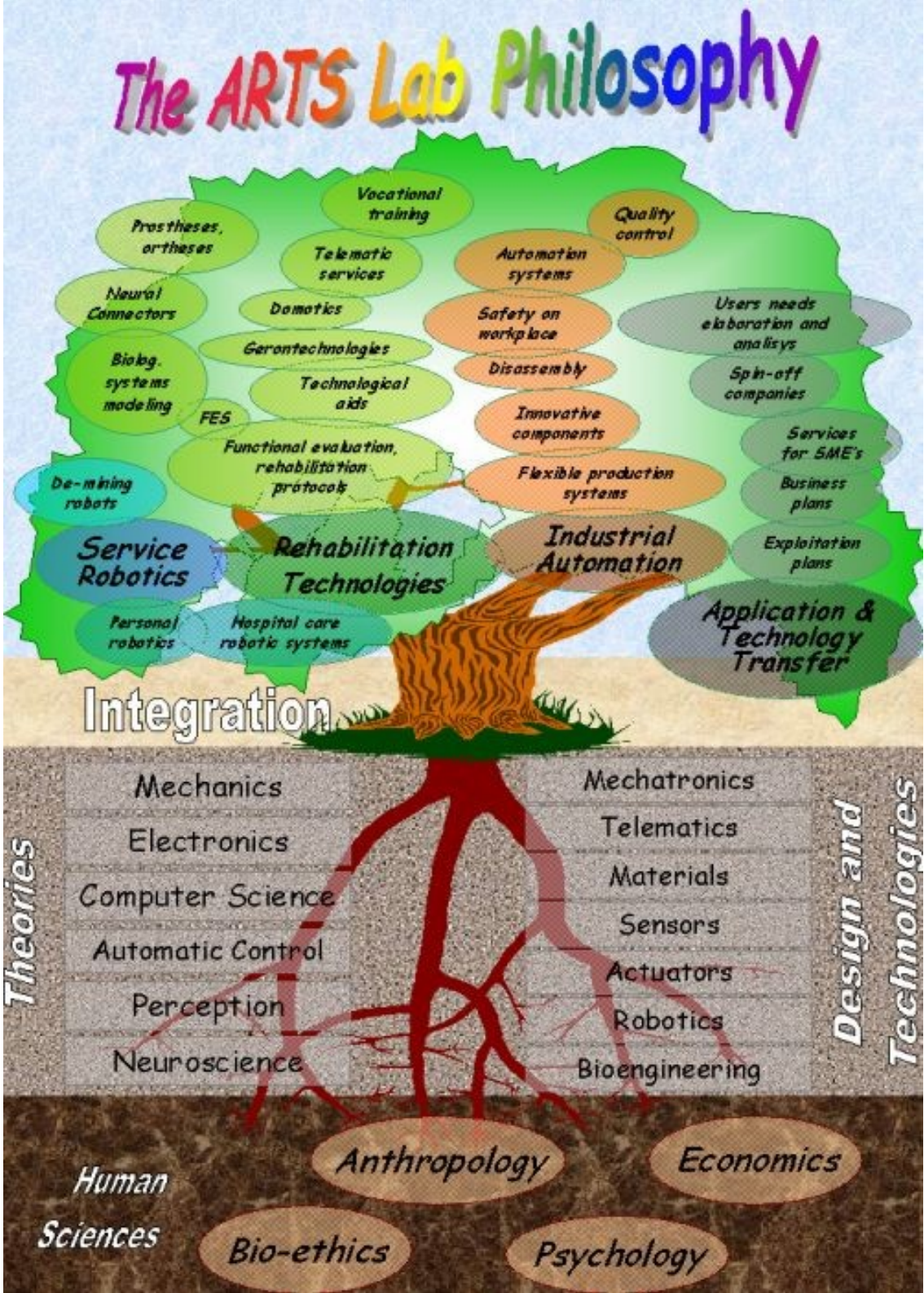
Prof. José M. Galván
Pontificia Università della Santa Croce
Roma

martedì 10 aprile p.v. alle ore 10:30 (aula 10 Palazzo Toscanelli).

Prof. Paolo Dario
Titolare del Corso di Biomeccanica

Richieste odierne

ARTS Lab
Scuola Superiore
Sant'Anna (Pisa)



Italy in Japan 2001

Italy-Japan 2001 Workshop

HUMANOIDS - A Techno-Onthological Approach

November 21st, 2001

International Conference Center - Waseda University, Tokyo

http://www-arts.sssup.it/ItalyinJapan

http://www.humanoid.waseda.ac.jp/ItalyinJapan/

Humanoid Robotics is the challenge for Robotics Research in the Third Millenium.

The problems posed by the development of Humanoid Robots require a wide multidisciplinary approach, including philosophical, cultural and ethical considerations.

scuola superiore
Sant'Anna
di studi universitari e di perfezionamento

Waseda University

WASEDA UNIVERSITY
HUMANOID

IEEE RAS Technical Committee on Robo-Ethics

ICRA 2005 - Workshop on Robo-Ethics
Barcelona, April 18th, 2005

Robotics & Automation Society

ethicbots

EMERGING TECHNOETHICS OF HUMAN INTERACTION
WITH COMMUNICATION, BIONIC, AND ROBOTIC SYSTEMS

International Workshop
Naples , 17-18 October, 2006

From biomedical engineering to technoethics

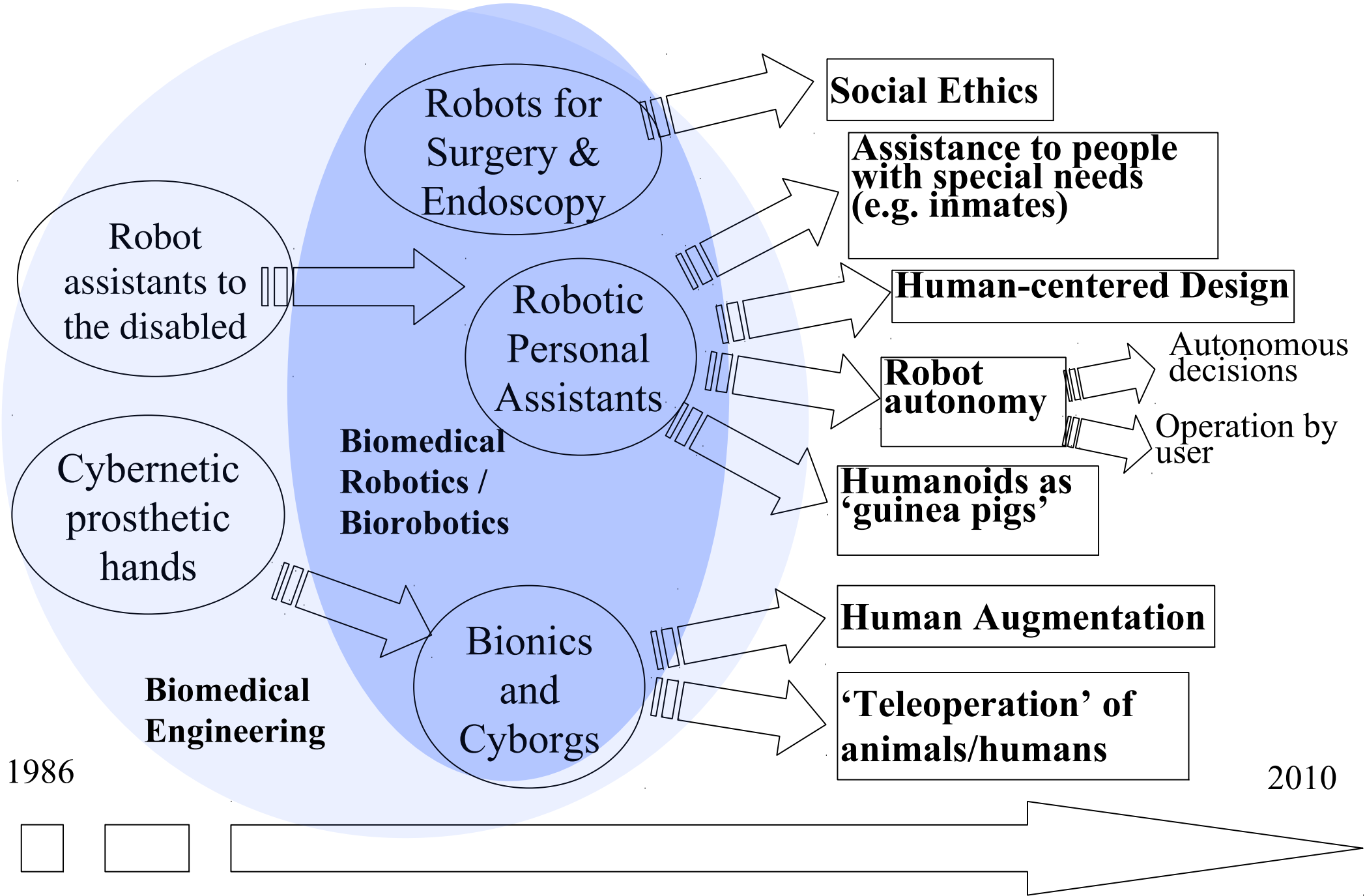
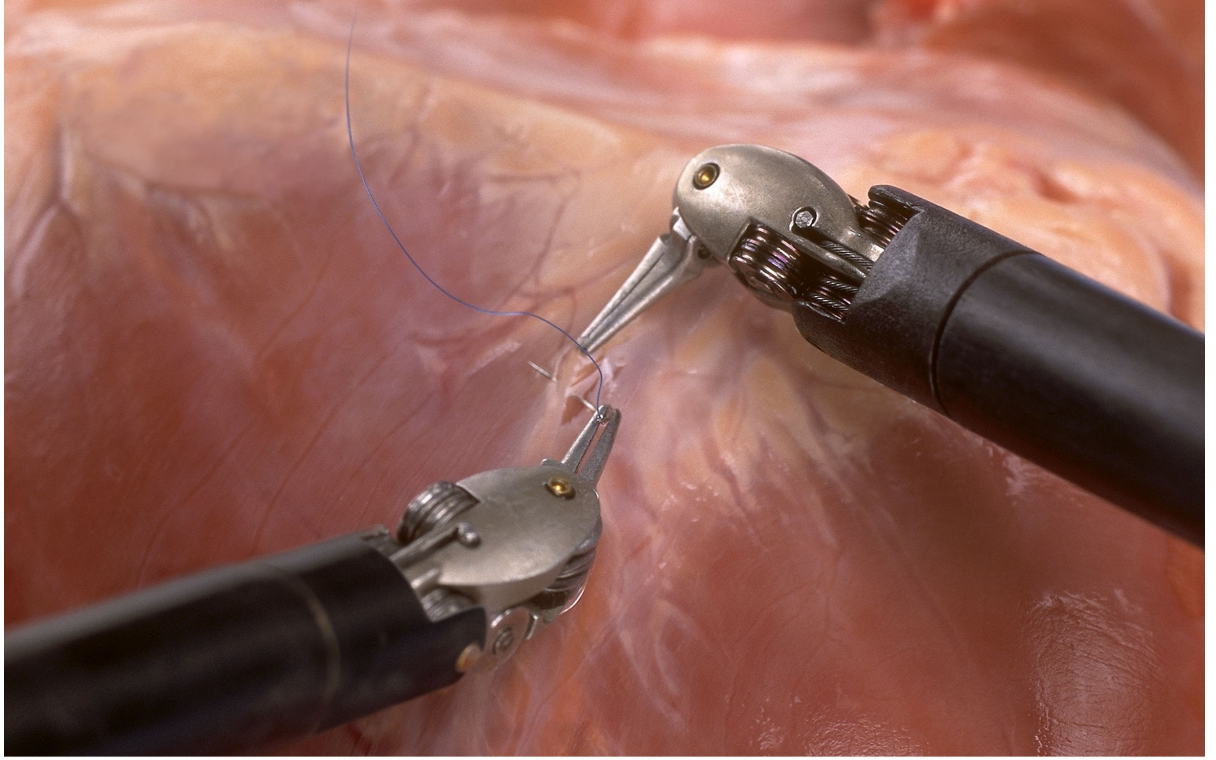
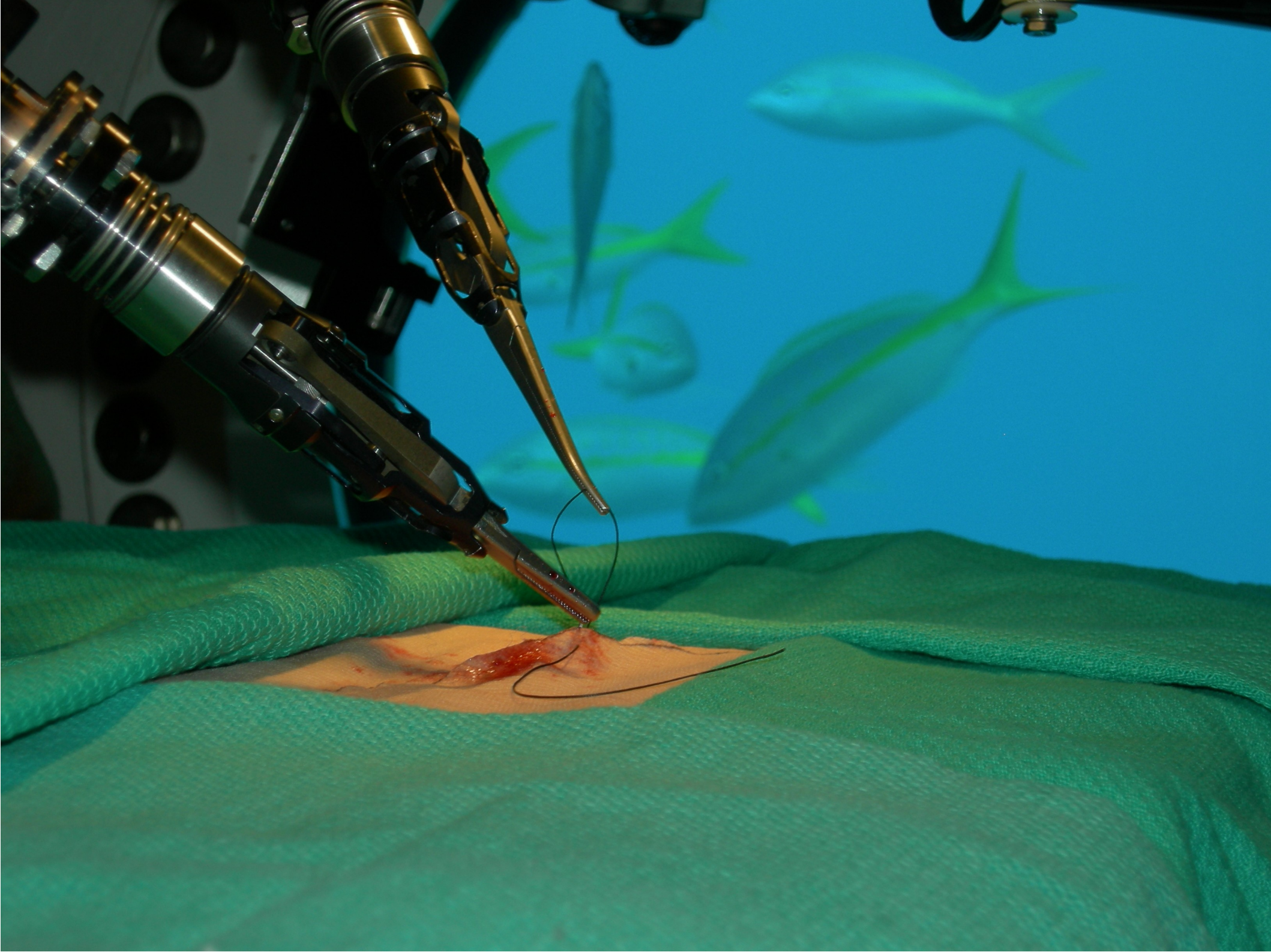
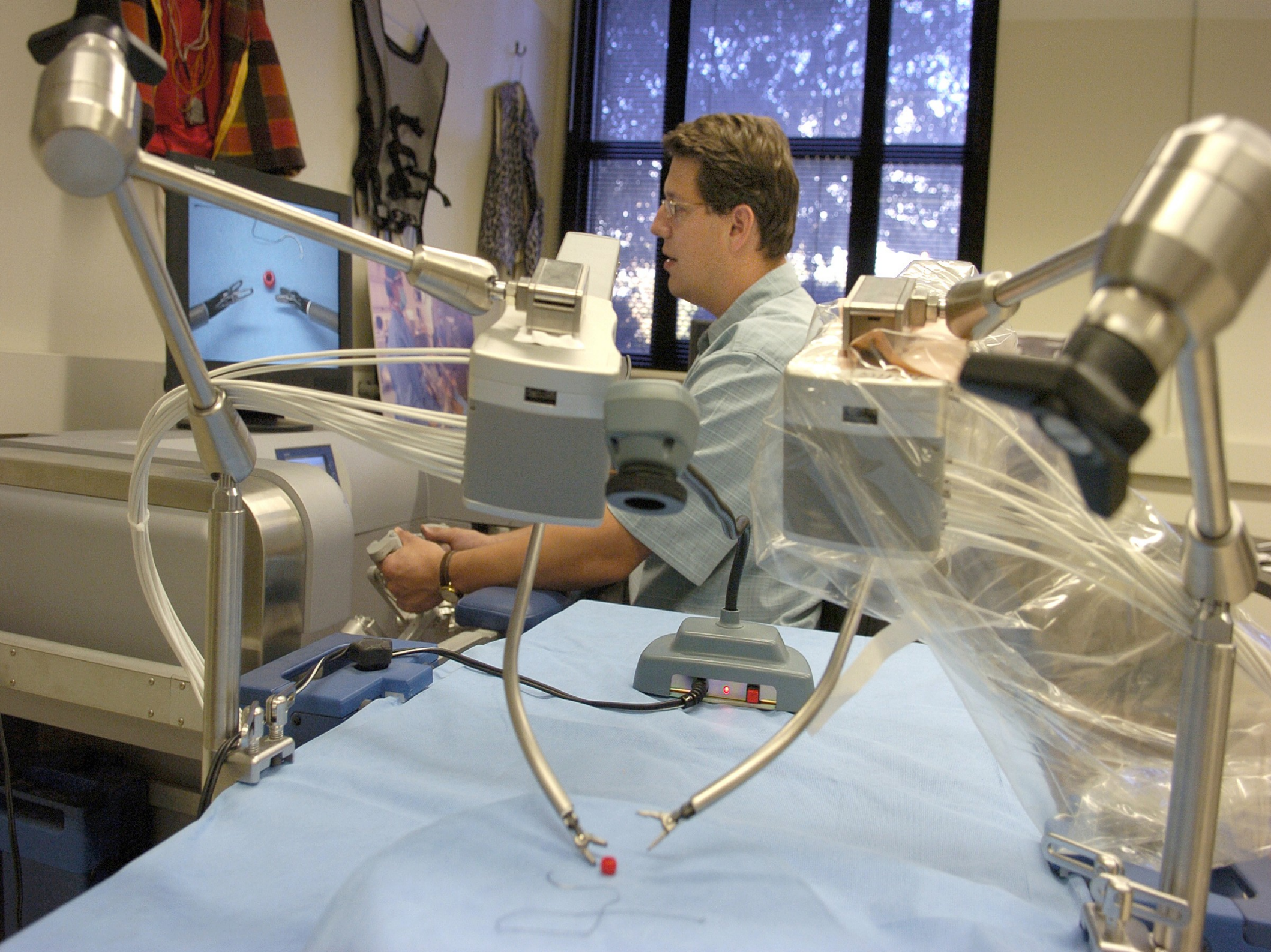


Figure 3a







Cyberhand Project

IST-FET Project #2001-35094
(01/05/2002 – 30/04/2005)

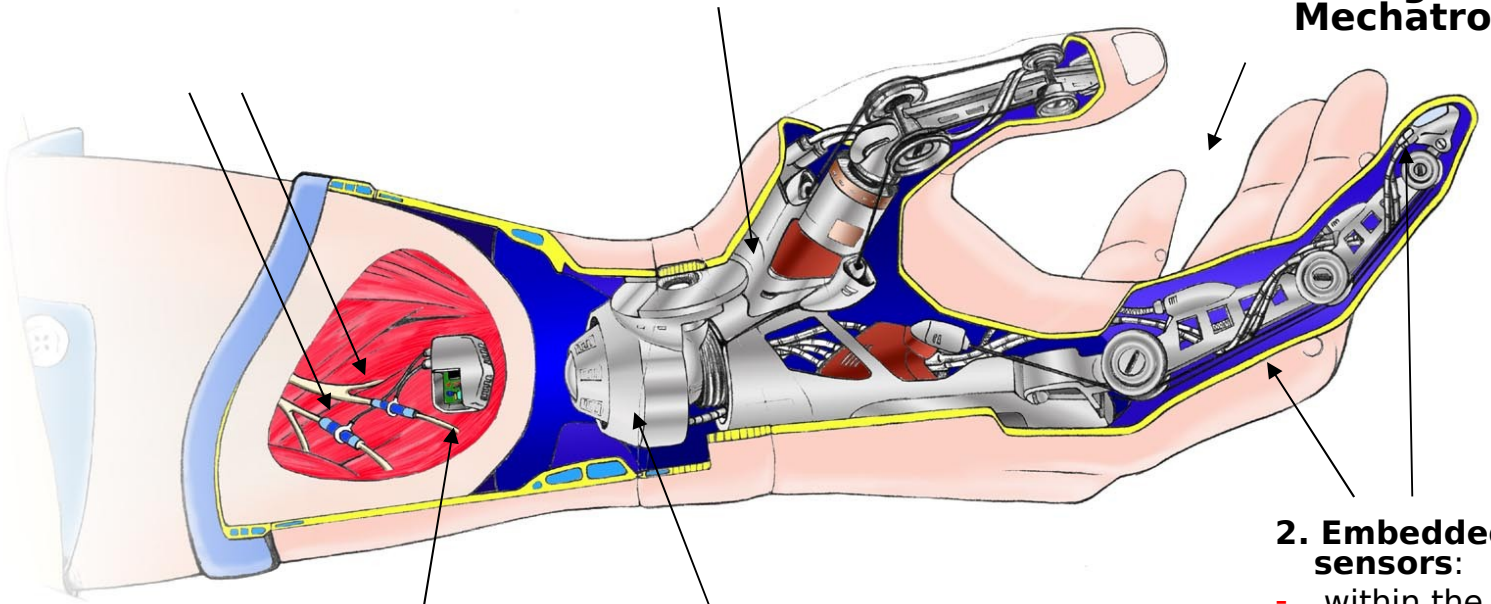
1. "Biologically Inspired" Mechatronic Hand
2. Biomimetic sensors
3. Regeneration-type electrode (efferent nerve)
4. Regeneration-type electrode (afferent nerve)
5. Implantable system for neural stimulation and recording
6. Efferent telemetric link
7. Afferent telemetric link
8. External unit for decoding patient's intentions and for prosthesis control
9. Cognitive feedback

Regeneration-type electrodes:

3. Regeneration-type electrode (efferent nerve)
4. Regeneration-type electrode (afferent nerve)

8. Decoding patient's intentions and **Embedded closed-loop control of the artificial hand**

1. "Biologically Inspired" Mechatronic Hand



2. Embedded Biomimetic sensors:

- within the structure
- within the glove

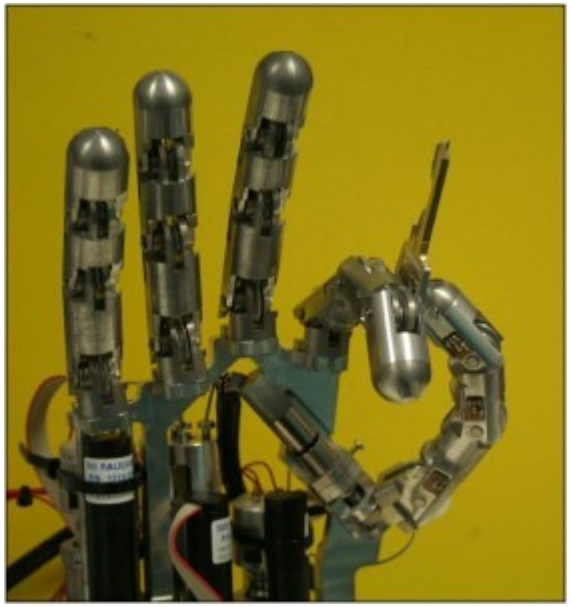
Stump

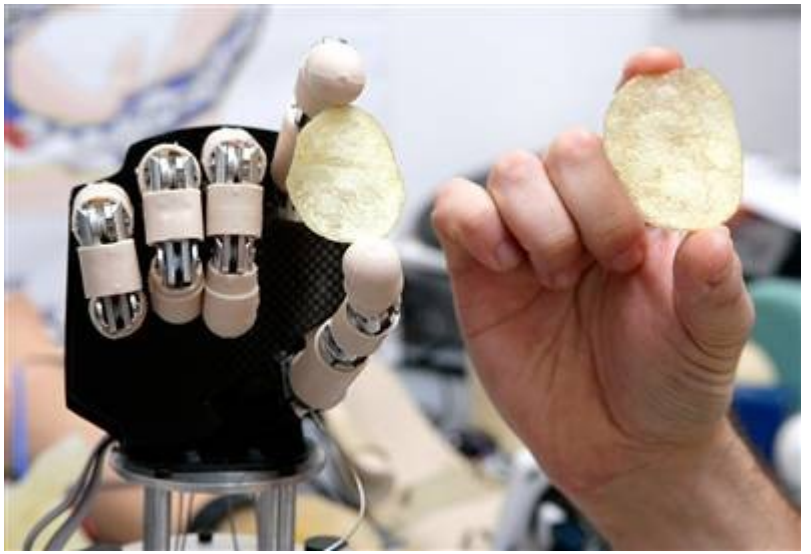
5. Implanted neural interface:

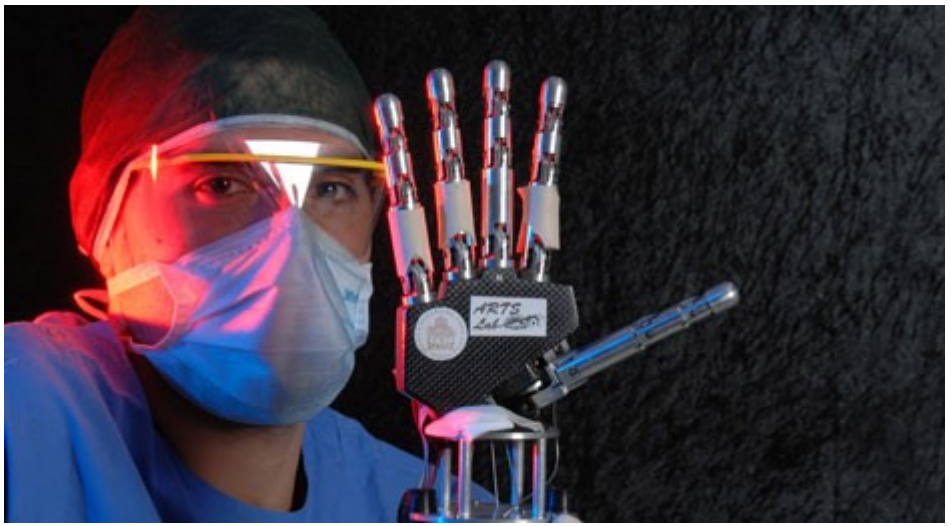
- ENG efferent signals recording (patient's intention detection)
- Afferent nerves stimulation (to provide sensory feedback to the patient)

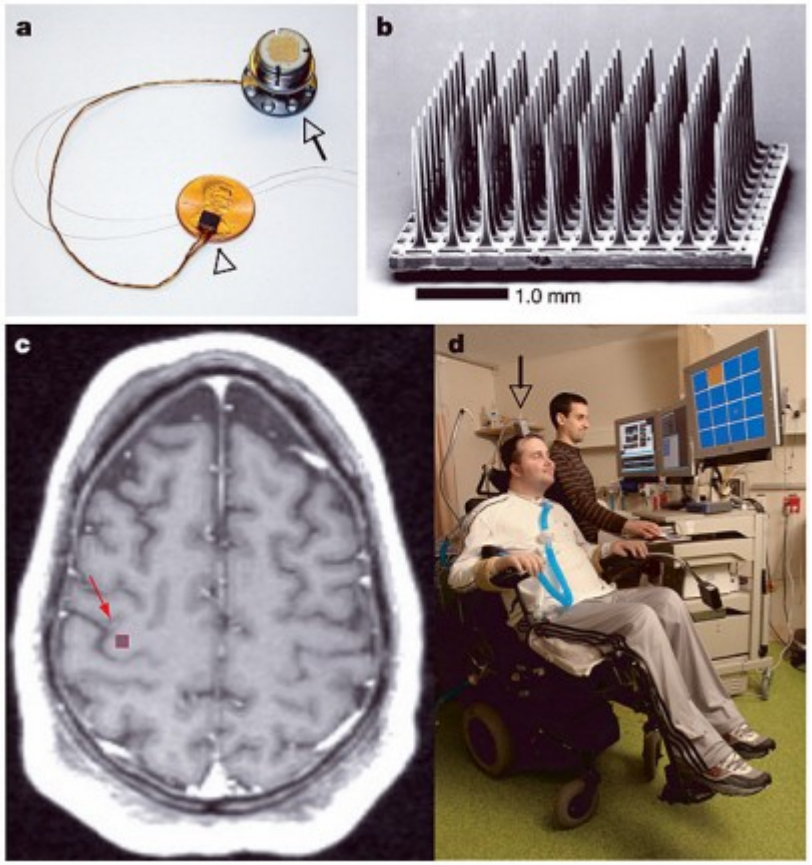
6. Receiver

7. Transmitter






ARTS
Lab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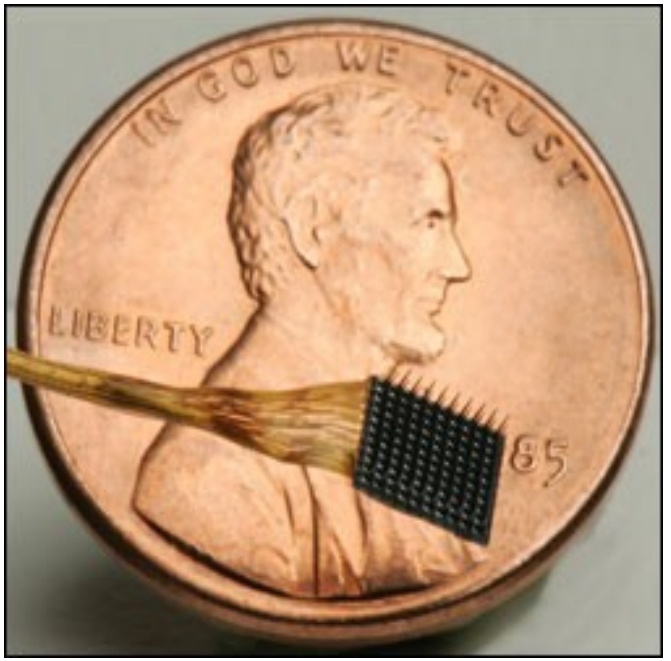
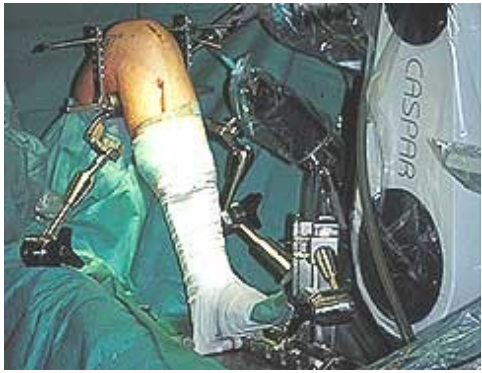

IN GOD WE TRUST
LIBERTY
85

A possible problem of social ethics

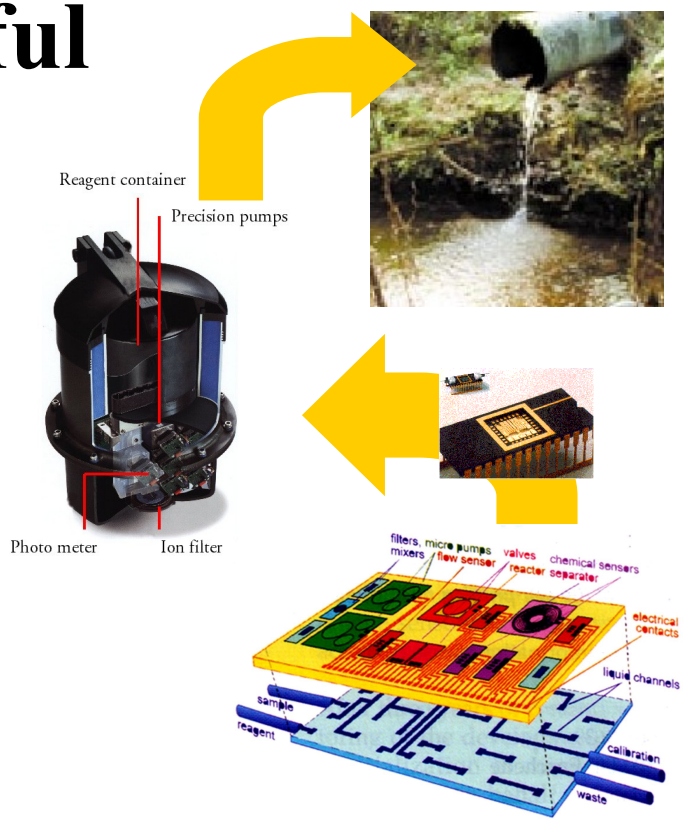
High tech, high cost technologies: the example of the surgical robot



Cost ~ 1.5 million Euros

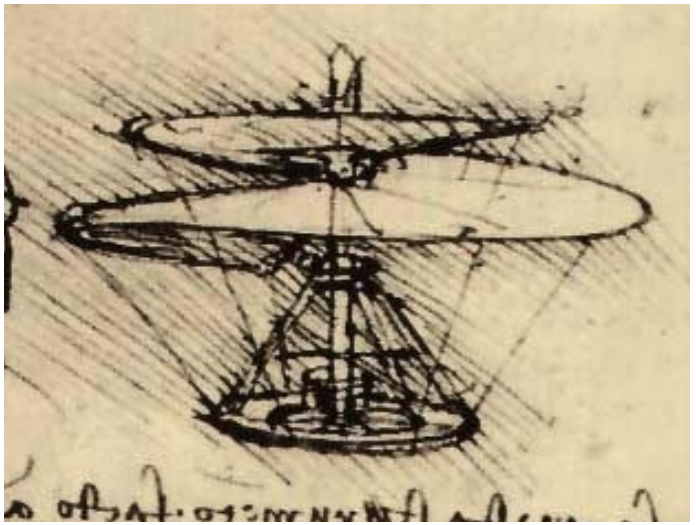
From “high-tech, high-cost” solutions

to “high-tech, low-cost” helpful machines

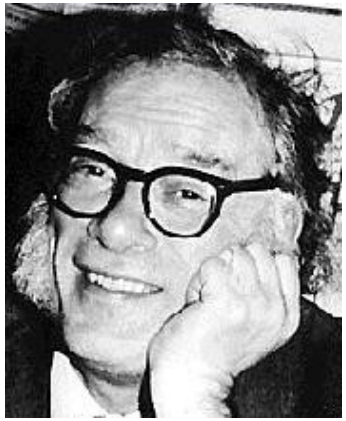


Ethics and Technology

- “It is ethically right to withhold further development of a technology that promises to increase the quality of life for the disabled and allow them to more fully participate in society?”



Ethical Questions (1/3)



- **Autonomous behavior of robots: what degree of autonomy should we give to the robot…**
  - If uncontrolled robot actions can be dangerous to humans *(assistance robotics)*
  - if we wish to deal with cases when the user's will is "ethically" unacceptable *(robots used for military purposes)*
  - Are Asimov's Laws adequate?
  - Is realistically threatening the possibility of auto-replicating artificial entities?
- **Ontological status of "cyborgs" and A.I. creatures:**
  - What is machine and what is human?
  - Who may be re-programmed?
  - Can we have dissidents in a world of replicants?

Ethical Questions (2/3)

- **About Robotic Assistants/Rehabilitation**
  - Can humans be suitably substituted by robots in assistive tasks in which emotions and empathy are involved?
  - Is it ethically right to eliminate less qualifying jobs?
- **About Augmentation**
  - Is socially desirable to extend the length of working life?
  - Can augmentation generate dangerous feelings of omnipotence or powerful super-humans?
- **Is robotics affordable only by rich people?**

Ethical Questions (3/3)

- “What kind of privacy safeguards are needed if a machine can read your thoughts?
- Will cognition enhancers exacerbate differences between rich and poor?
- Or, instead, will they relegate social diversity to the status of historical artifact?
- What happens if we deduce through neuroimaging the physiological basis for morality?
- Or, and by the way, what happens to free will?”

Scientific American (Editorial), September 2003

“Sometimes the criticism of science and technology is so severe that it comes close to a condemnation of science itself. On the contrary, science and technology are a wonderful result of human creativity which is a gift from God. They have furnished us with wonderful possibilities, and we benefit from them with a grateful soul. However, we know that this potential is not neutral: it can be used either for the progress of man, or for his degradation”

Juan Pablo II (Hiroshima 25.02.1981)

“No podemos ver el mundo de la técnica, obra del hombre, como un ambiente totalmente ajeno a la verdad”

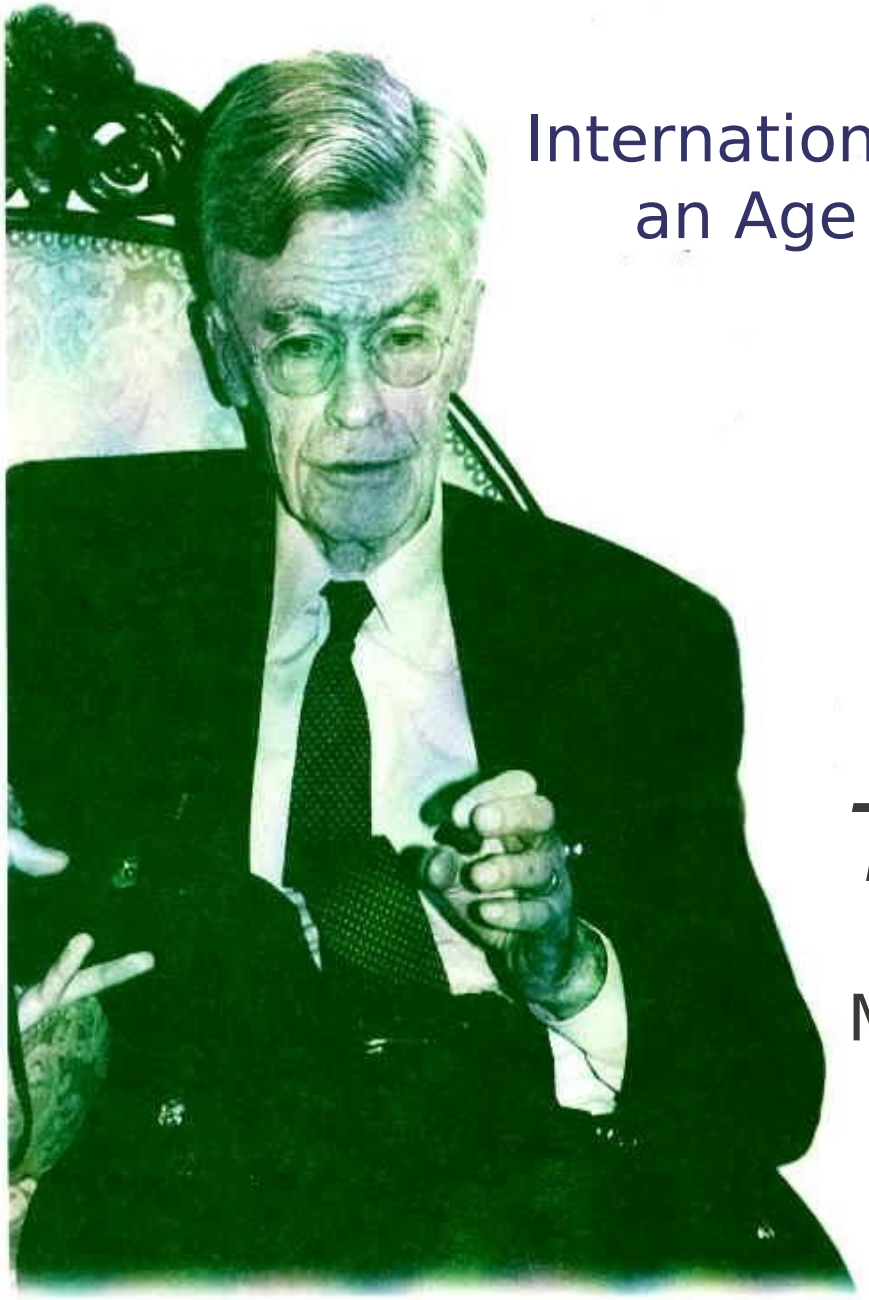
“No existe ningún motivo para concebir la cultura tecno-científica en oposición con el mundo de la creación de Dios”

“La ciencia técnica, que tiene como objeto la trasformación del mundo, se justifica en base al servicio que da al hombre y a la humanidad”

“Servicio fraterno a nuestro prójimo, al que debemos este empeño, como al menesteroso se debe la caridad”

Juan Pablo II (Colonia 05.11.1980)

מכון טכנולוגי לישראל Technion Israel Institute of Technology
הטכניון



International Symposium on Ethics in
an Age of Pervasive Technology
(Haifa 1974)

Toward a Technoethics

Mario Bunge (McGill University)

“the technologist, just as everybody else, is personally responsible for whatever he designs, plans, recommends, or execute”...

“the technologist who contributes to alleviating any social ills or to improving the quality of life is a public benefactor”...

“the technologists should tackle their own moral problems rather than pretend that they can be transferred to managers and politicians”

(M. Bunge, *Towards Technoethics*, 1974)

“Technologists should contribute to the overhauling of ethics, attempting to construct a technoethics as a science of right and efficient conduct”

(M. Bunge, *Towards Technoethics*, 1974)

Technoethics **can be defined as a sum total of ideas that bring into evidence a system of ethical reference that justifies the profound dimension of technology as a central element in the attainment of a "finalized" perfection of man.**

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TECHNOETHICS:
destination of a technical event to the true good of humanity

Definición de técnica (1)

Capacidad practica de operar para realizar un determinado fin, en cuanto fundada en el conocimiento y la experiencia del modo en el que es posible alcanzarlo.

(Enciclopedia Italiana Treccani)

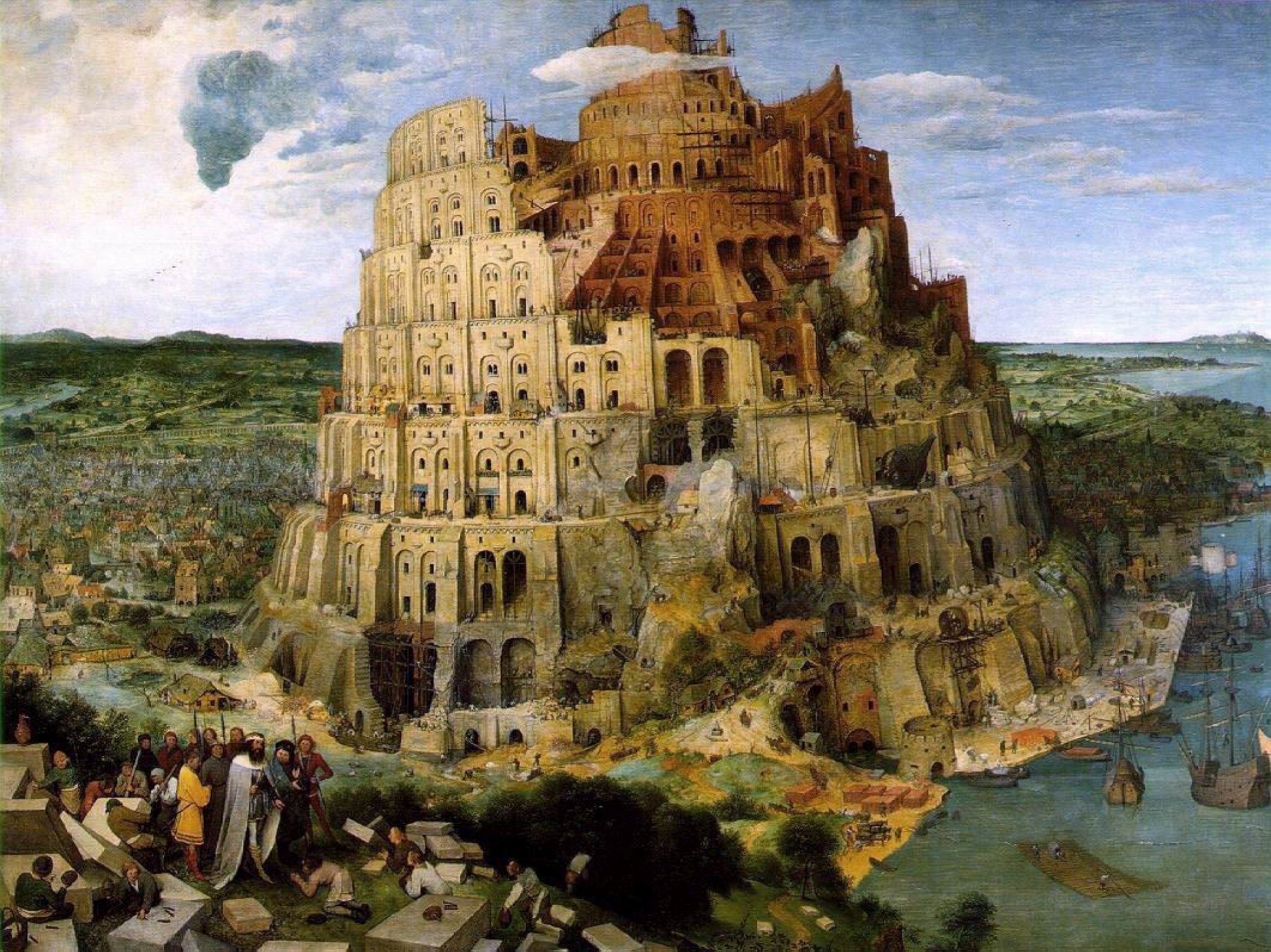
Definición de técnica (2)

Forma de aplicación del conocimiento científico al dominio práctico de la realidad misma.

(Enciclopedia Italiana Treccani)

“homo technicus”

- Prometeo y el fuego de los dioses.
- Adan en el Paraiso *ut operaretur.*



"homo technicus"

- El hombre es capaz de hacer que el elemento exterior asociado al propio obrar sea incorporado a la humanidad. En esto consiste la técnica
- El pensamiento técnico "plasmado" hace que de un hecho técnico concreto se puedan derivar otros, haciendo así posible la civilización y el desarrollo tecnológico

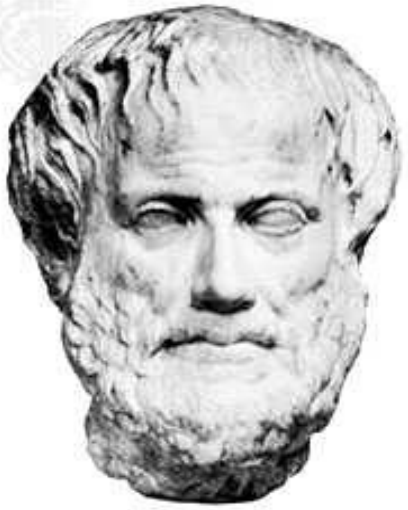
Definición de técnica (3)

TECNICA= razón humana objetivada

“homo technicus”

El objeto del obrar técnico es

la invención socializada



HUMAN TECHNICAL ACTIVITIES:

- Creation of inanimate tools directly or indirectly guided by human intervention
- Creation of machines that artificially assist organic life (bioengineering)
- Creation of symbolic devices (ICTs,)

Fig. 3. The first android; Repliee R1 (*left*: developed by Osaka University), and the latest android, Repliee Q2 (*right*: developed by Osaka University and Kokoro Corporation)

Fig. 4. Facial expressions generated by android Repliee Q2

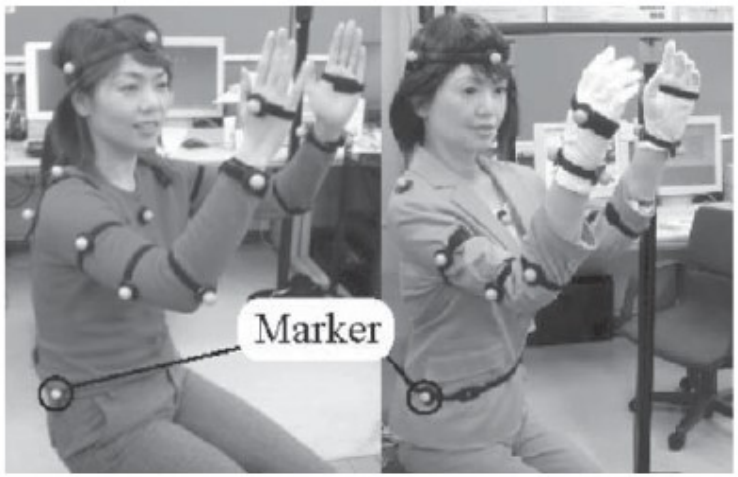


Fig. 5. Replicating human motions with the android

Fig. 8. Geminoid HI-1 and its human source

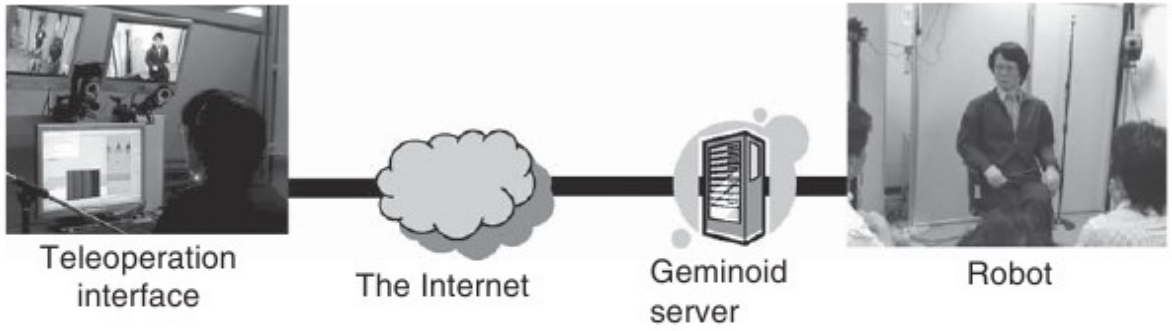
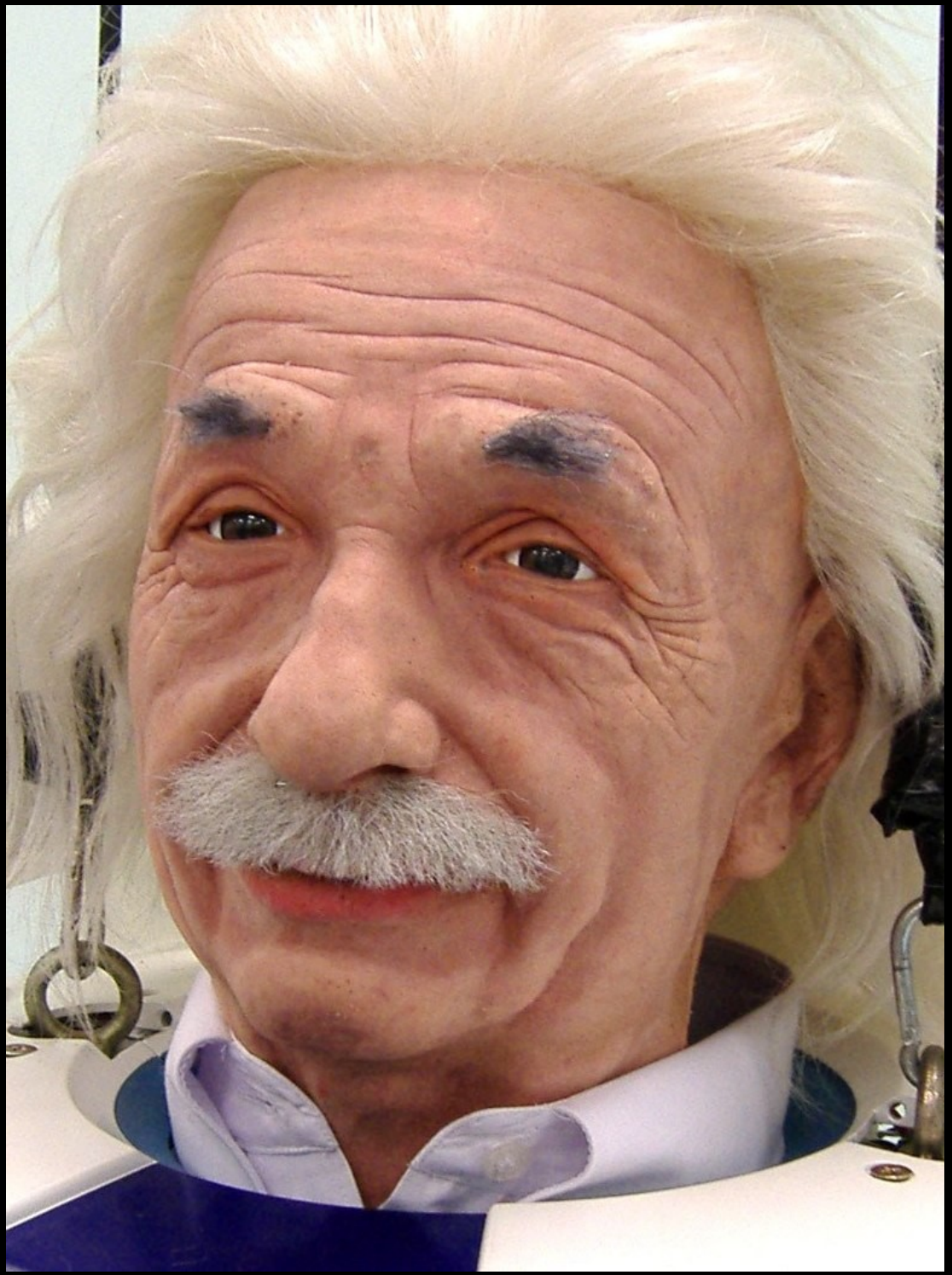
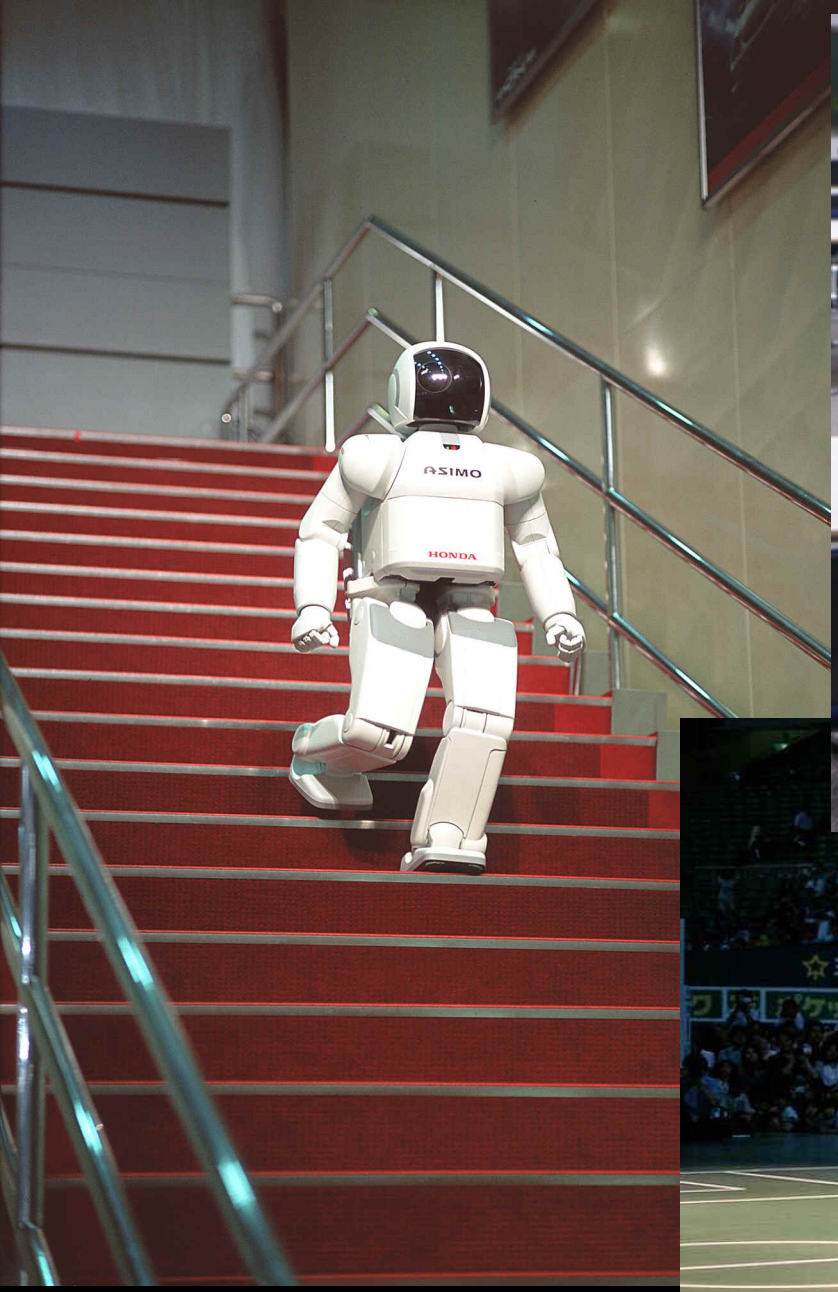


Fig. 9. Overview of the geminoid system

Fig. 10. Teleoperation interface


hubo lab
KAIST
Albert Hubo




ASIMO
HONDA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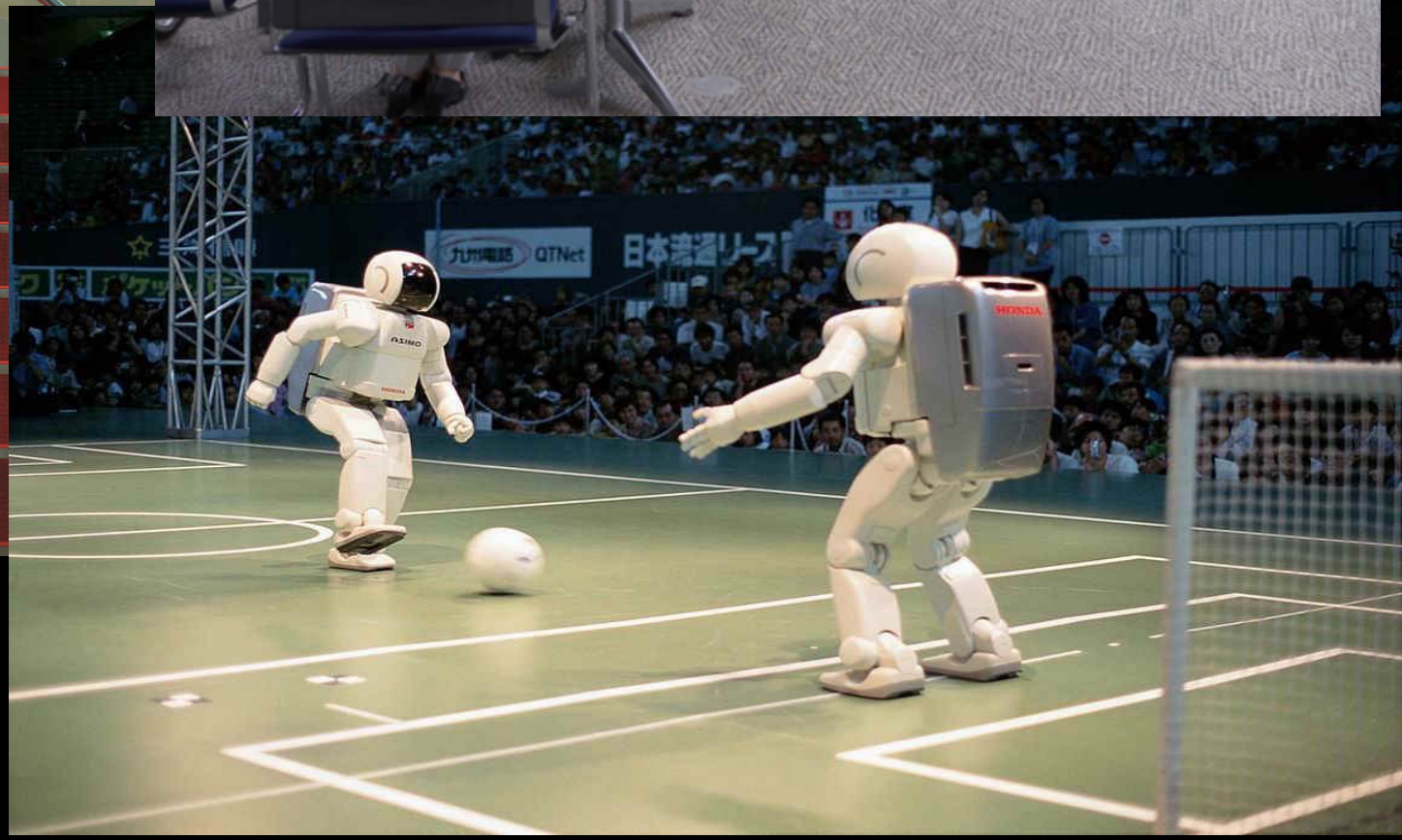
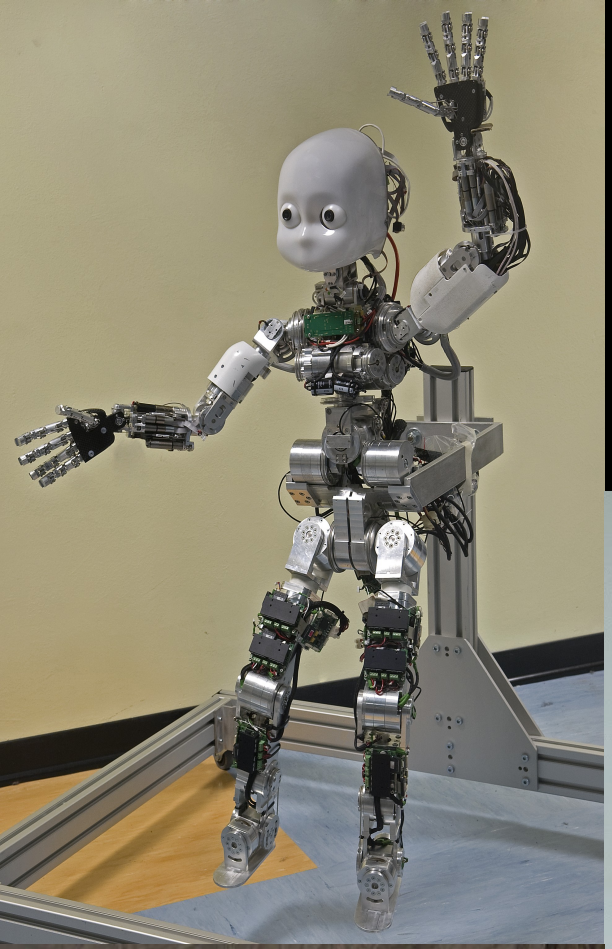
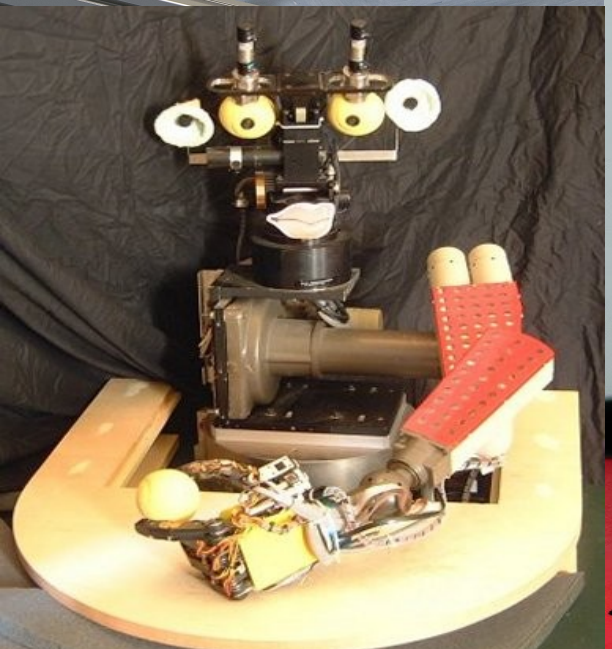
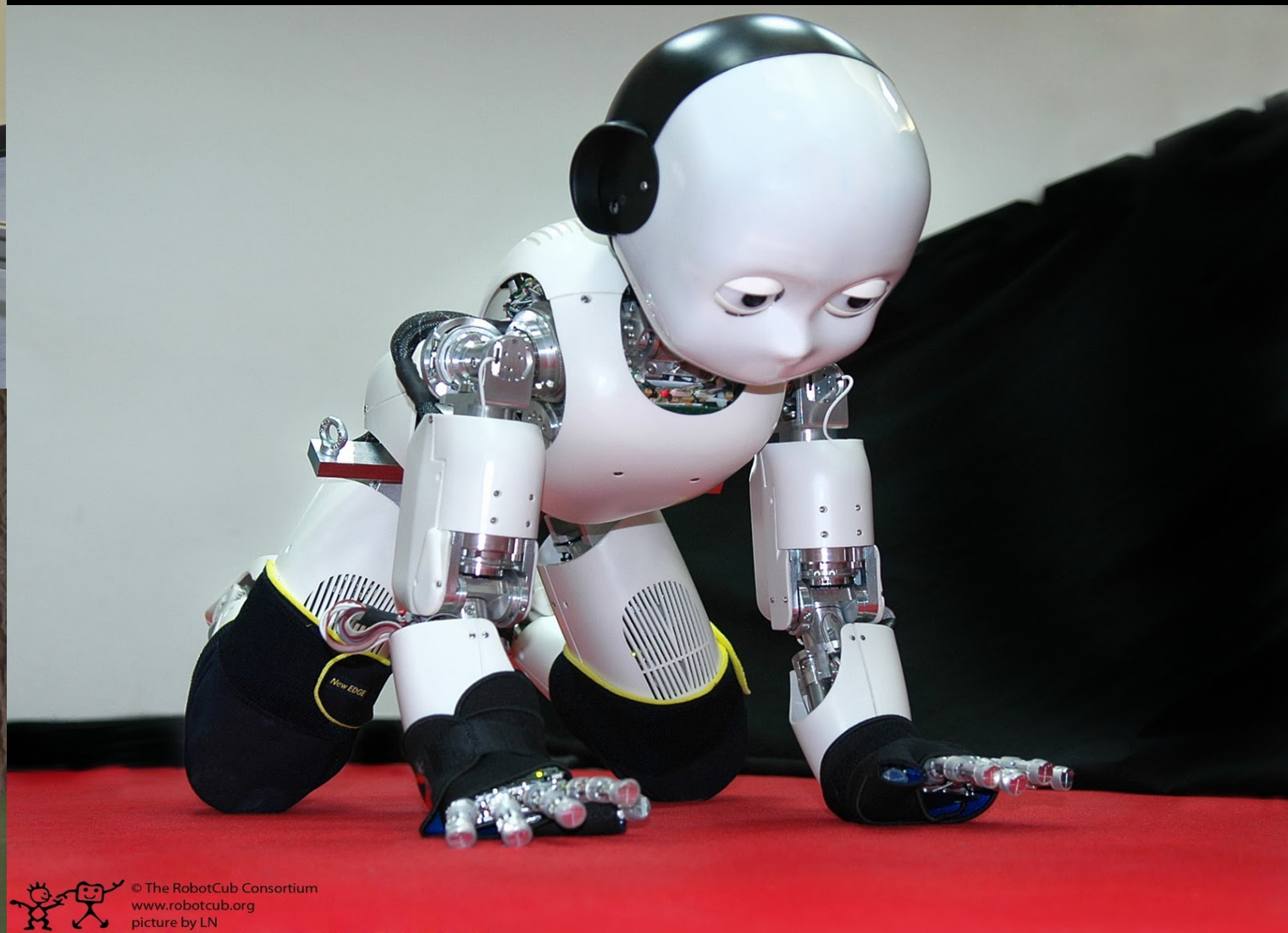

九州電話
QTNet
ASIMO
HONDA





Babybot, Lira Lab Università di Genova

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a company of Sanrio Group
www.kokoro-dreams.co.jp/
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Definition of humanoid

“a humanoid is not less than...

Definition of humanoid

…a symbolic (partly) unlimited machine”

the symbolic spectrum of man includes the corporeality, for the symbolic ability of the language is intrinsically linked with the body

The body is the first symbolic tool of man

the symbolic ability of the humanoid is limited only by the same limits of the human corporeality

the “written word” or a word in anyway disconnected with the whole person can have many advantages at the level of historical, social, artistic meaningfulness, but is always under the symbolic ability of the “pronounced word”

Further clarifications

an AI system must include, to be considered as humanoid, a bodily dimension capable to establish relational links with the environment through sensors and effectors

the specific characteristic of the human or humanoid language is the significant pluri-finality

the human word has a total conventionality (not arbitrariness!), in which the link between the sign and the signified reality is added to the nature

the human word is non *natural*, but *cultural*

The indetermination of the symbolic ability in the humans founds a gap between being and language, between “internal word” and “external word”, between all that the person reveals through his/her symbolic manifestations and all that is the true perfection of his/her being

Ethical dimension of the symbolic function

the ethical dimension of the language consists precisely in this required continuity, acted by the personal freedom

SYMBOLIC ABILITY = ETHICAL DIMENSION

the symbolic transfer

Ethical dimension of the symbolic function in a machine

a humanoid performs autonomous functions that can look like ethical acts

its product is apparently not a final formalized product

in humans the ability for ethical acts lies in the self-orientation of the actions to the final aim of mankind; what does occur in the case of the machine?

technics are not limited by the goal of the technical act; every technical achievement opens new possibilities, because technics has not a finalistic sense, despite every technical object is finalized to the purpose which is decided in its production

in technology every arrival is a departure

the human ability in giving a finality to acts can integrate the objective dimension of the technical act in the free finalization of human acts

Ethical dimension of the symbolic function in a machine

"reproducing" the symbolic spectrum is not a new symbolic function: it is necessary to consider it as a more complex

"already-produced-symbol"

in the human acting the formalization of an act as directed toward the end is due to the free will, and not to the physical dimension of the act

(obviously, this implies the statement of the free will as not reducible to the biological functions)

the humanoid, instead, formalizes its symbolic act only with the nexus between the physical reproduction of the human act and the formalizing human free will, and not only in the act of reproducing itself

the human free will transfers the symbolic ability to the machine through the intrinsic technical capability of human beings

Final ethical considerations / 1

the ethical dimension of humanoids is gathered primarily from the human free will that has built them

Final ethical considerations / 2

the humanoid, being a symbol capable of reproducing the symbolic function, increases the expressive capacity of freedom in a very important way; if the use of this capacity is ethical, this increment is very good from the ethical point of view

Final ethical considerations / 3

every symbol must be transparent, but the profusion of symbols can easily carry to a diminution of the symbolic capacity; this implies a very hard ***extrinsic ethical request***, for the symbolic possibilities of humanoids are really very big

Final ethical considerations / 4

in humanoids there is also a more important ***intrinsic ethical request***, non present in other symbolic machines, that comes from the symbolic transfer between human and machine

this is not always ethically correct, because non all the symbolic functions are transferable

Final ethical considerations: intrinsic ethical request / 5

the symbolic transfer is ethically correct when the object of the transfer is a human symbolic ability which consists in an

objective trans-personal cultural dialogical product

Final ethical considerations: intrinsic ethical request / 5 bis

The symbolic transfer is ethically problematic when the dialogical ability of the whole person is involved in a ***subjective personal level***

Final ethical considerations: intrinsic ethical request / 6

obviously these considerations must be preceded by the ethical judgment of the *transferred function* apart from the transfer itself

using a humanoid for stealing is always evil, although the humanoid in this case is able to act in a “very human way”!


BIOTECNOLOGIE
MAI !!

- Si el obrar humano se impone sobre el objeto técnico, puede alcanzar su finalidad.
- Si el objeto técnico se impone sobre la acción, la persona humana es subordinada.
- El poder determinante en orden al fin pertenece al obrar humano: la técnica es teleológicamente indeterminada.
- El hombre moderno tiende a abandonar en el objeto técnico el poder determinante.
- La clave última la tiene la persona humana, que es dominada por la maquina solamente si (la persona) quiere.

Paradigm-shift

Modernity:

- Objective knowledge
- Dominion of reality
- Science over technology (techno-science)

Phases of the Modernity

- Secularization
- Autonomy
- Principle of immanence
- Profane vision of the cosmos

Leibniz, *Nova methodus pro maximis et minimis*

“Quando orietur controversiae, non magis disputatione opus erit inter duos philosophos, quam inter duos computistas. Sufficet enim calamos in manus sumere, sedereque ad abacos et sibi mutuo (accito si placet amico) dicere: calculemus”

After the final destruction of Nazi tyranny, they hope to see established a peace which will afford to all nations the means of dwelling in safety within their own boundaries, and which will afford assurance that all the men in all the lands may live out their lives in freedom from fear and want

Scientific paradigm:

Technology as the only redeeming solution in the face of the awareness of the imperfection of mankind: the person is auto-marginalized.

La crisis contemporánea

el olvido de la persona

Cuando, vaciando el sentido profundo de la persona, se la convierte en sus funciones, la tentación de sustituirla con una maquina es muy fuerte:

a nivel funcional, la persona es más decepcionante que la maquina!

La crisis contemporánea

la renuncia a la libertad

Los grandes profetas de la crisis de la modernidad, como Nietzsche o Dostoievski, anunciaron a su tiempo que la humanidad había elegido un camino en el que no habia espacio para la libertad.

Como afirma el Gran Inquisidor, la libertad es la ùltima cosa que el ser humano desea.

La crisis contemporánea

la indeterminacion finalistica

No se puede caer indefinidamente en el engaño de afirmar el futuro del hombre únicamente como mero progreso tecnológico.

La idea de progreso es finalisticamente indeterminada, vacía, convierte al hombre en una hormiga infatigable, en el Sísifo de Camus.

No se puede llegar a la plenitud del humano simplemente añadiendo tiempo.

Jorge Luis Borges, “El Inmortal” (1949)

Paradigm-shift

Post-modernity:

- Relational knowledge
- Mutual interaction with reality
- Technology over science

“ACCOMPANIED” REASON

We are conscious of not being able to continue with a form of knowledge that is objectivising and not compromising: our knowledge of reality has to be revested with an open attitude, capable of entering into relationships with it.

The post-modern man, convinced of having to depend on technology in order to attain happiness, must necessarily integrate it into his dialogical structure.

The necessary reference to freedom that is present in every product regarding technique gives it a radical ethical dimension. It can be oriented or not to the achievement of human happiness from the point that their finality can be found in the relational condition of man.

natural vs artificial?

...natural vs artificial?

res cogitans vs res extensa

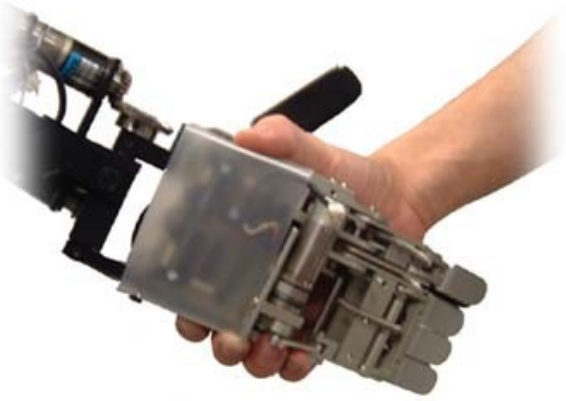
natural & artificial

What is natural is all that is formalized by nature and what is artificial is that which is formalized by freedom.

natural & artificial

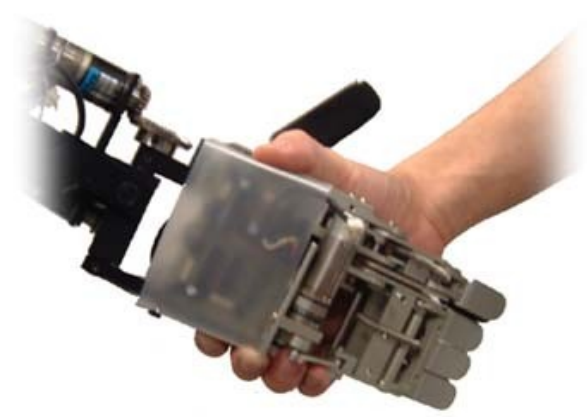
Man himself is thus an artificial being as he can auto define himself by his actions, both negative and positive ones.

...cyborg or *homo cybersapiens*?



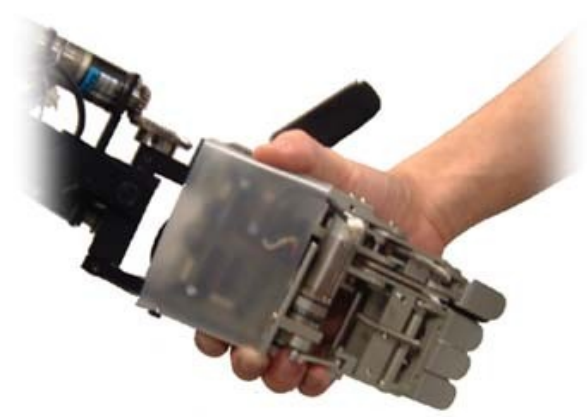
THEOREM 1

The objective of technology is to increment interpersonal relationships



THEOREM 2

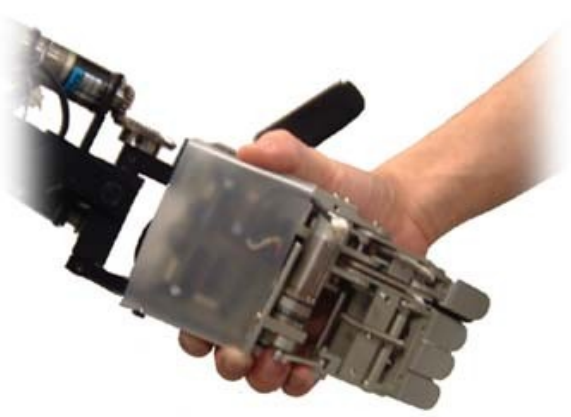
When experimental science becomes technology it becomes spiritual



THEOREM 3

(Antoine de Saint-Exupery)

The more a machine is developed, the more it disappears



provocación!!!

SCIENTIA ANCILLA TECHNOLOGIAE

La tecnologia llega a la verdad del ser con mayor profundidad que la ciencia, porque llega a la persona.

Como en el Renacimiento florentino, en la cima del conocimiento verdaderamente científico tecnología y arte se funden en su común origen semántica: la *tecnè* griega.