

Can Humans be Replaced by Autonomous Robots?

Ethical Reflections in the Framework of an Interdisciplinary Technology Assessment

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Outline

- Technology Assessment
 - Technology assessment of autonomous robots:
An interdisciplinary problem
 - The ethical perspective
 - Recommendations to act
-

Technology Assessment (TA)

(Definition)

Technology assessment (TA) is a scientific, interactive and communicative process which aims to contribute to the formation of public and political opinion on societal aspects of science and technology.

Technology Assessment (TA) **(Policy Advice)**

On the level of Parliaments and Ministries.

For example ITAS:

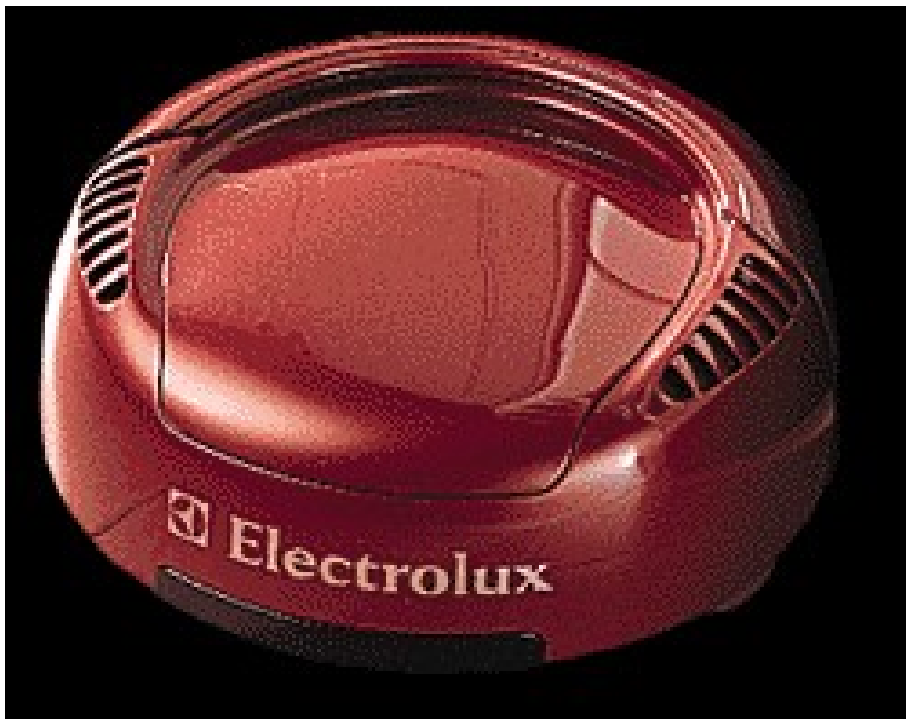
Runs the Office for TA at the German Parliament

Coordinates the TA for the European Parliament

Runs TA-projects for several German Ministries

Technical Perspective

Vacuum-Cleaner-Robot

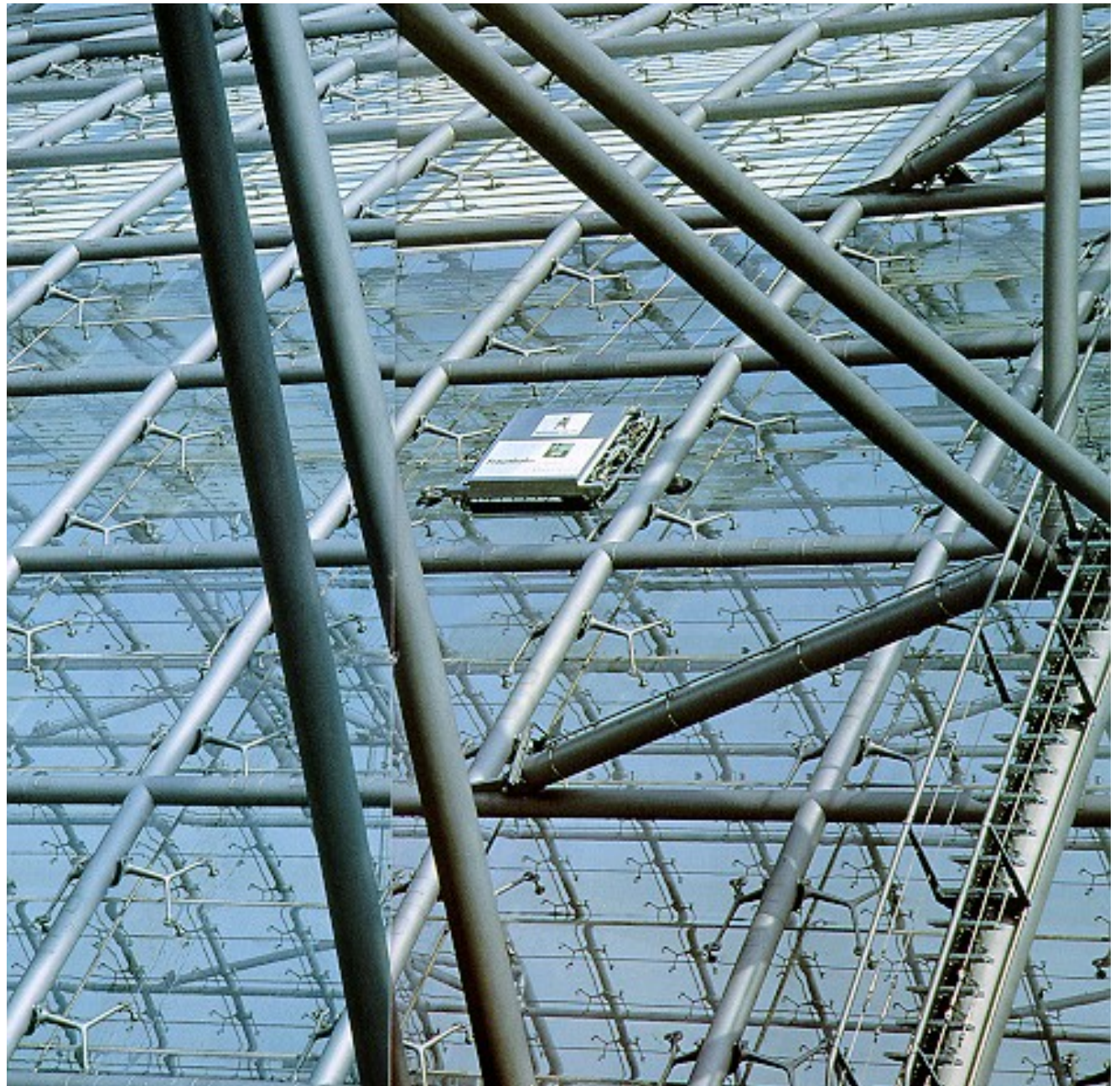


Lawn Mower-Robot



Economical Perspective

Window-Cleaning-Robot
Fhl Fabrikbetrieb und Automatisierung
Exhibition Hall Leipzig
(10000 m² Glasfläche)



Legal Perspective

Service-Robot

„DAVID“
FAW – Ulm

Equipped with learning algorithm



Ethical Perspective

Robo-Dog
„Aibo“

Sony



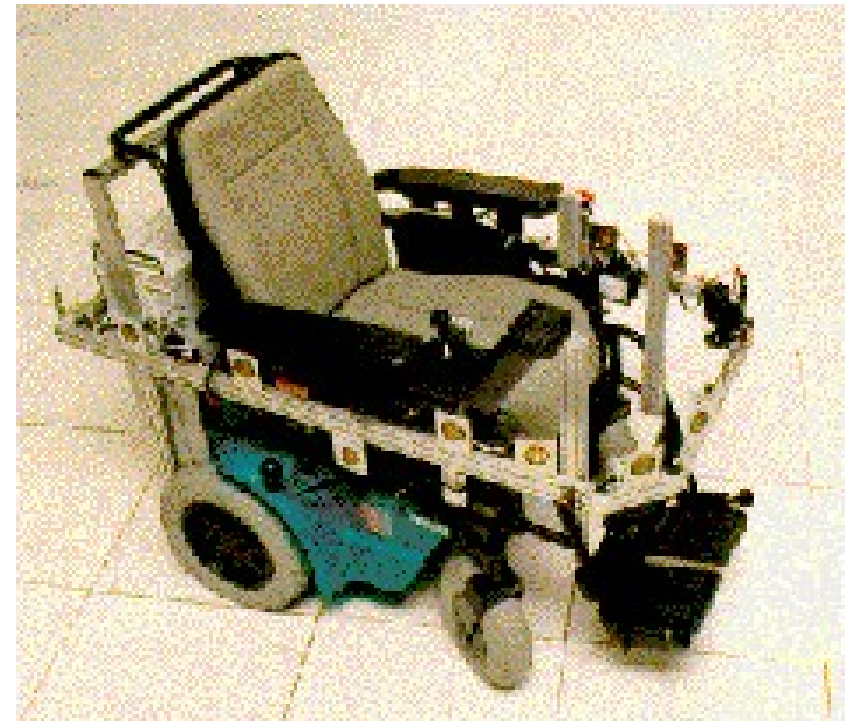
Medical-Care-Robot
„Care-o-bot“

Fhg IPA Stuttgart



Wheel Chair-Robot

University of Bremen



How develops good interdisciplinary TA?

- Excellent disciplinary research
- Transparent decisions on relevance
- Pragmatic interconnection of the disciplines
- Quality control by external experts

→ Work programme

→ „Seed-Texts“

→ Definitions of core notions

→ Common Argumentation

→ Recommendations to act

→ Research Council

→ Kick-off-Meeting

→ Midterm-Meeting

→ Research Council

Ethical Perspective

Replaceability: Means to an end relation

Two guiding principles:

Do not treat humans like mere means
(Kant's formula of humanity (“Instrumentalisierungsverbot”))

Distribution of fairness
(avoid a “robot-divide”)

Recommendation to act



Position of
humans in the
hierarchy of
steering functions.



Recommendation to act

Dealing with
and
equipment of
learning robots

Recommendation to act

Dealing with learning robots

Learning robots should be distinguished from robots without learning ability, because the use of learning algorithms influences the liability for damages between robot producer and robot user.

We recommend that the learning process needs to be transparent for the robot user. The implementation of a „Black Box“ which documents changes and the results of learning processes might be sensible in this context.

Recommendation to act

Change of Burden of Proof

Service-Robot
(Prototype)
IPA Stuttgart



Recommendation to act

Surgical robots

Robots will support the broad use of minimal invasive surgery. As far as we oversee the technical and computer science developments autonomous robots will not be used in surgery in the near future. However, there will be a step by step taking over of surgical (sub-) tasks from navigation aid to first manipulating tasks.

We recommend to support these medical developments in robotics since they have the potential to increase quality in surgical treatment.



Final Report

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Robotik.
Perspektiven für menschliches Handeln
in der zukünftigen Gesellschaft
