ROBOT EXPERT PANEL (REP I)

REELER
Responsible Ethical Learning with Robotics

RESPONSIBLE ETHICAL LEARNING WITH ROBOTICS

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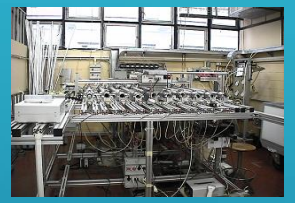
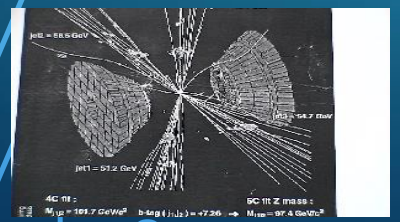
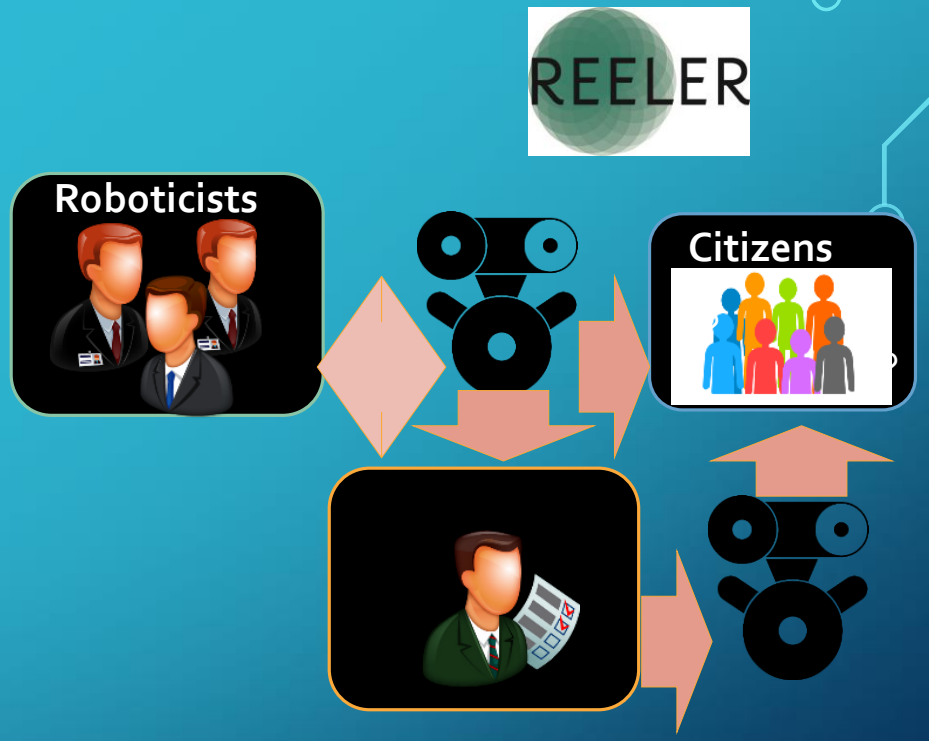
Studying Robots and pervasive technology

REELER





REELER introduction



Motivation:

Distance between

ROBOTICISTS ≠ CITIZENS ≠ POLICY-MAKERS

causes:

- little collaborative learning between groups
- conflicting systems of values
- unintended impact:
  - Not full potential of robots
  - robot sabotage (MIT Technology review, 2015)
    skewed labour market (Ford, 2015, The Rise of Robots)
    altered human condition (Floridi (Ed.), 2015, The Onlife Manifesto.)

Ambition

REELER seeks to:

1. Align roboticists' visions of a future with robots with empirically-based knowledge of human needs and societal concerns.

2. Develop a proximity-based human-machine ethics that considers how individuals and communities connect with robot technologies.

3. Increase collaboration and unleash learning potential

REELER – HUMAN ROBOT PROXIMITY SPECTRUM

(ROBOTS EXEMPLIFY THE CASE)

HIGHER

Retrainer
Ab.Acus

Integrated

Worn or implanted on a person

KASPAR
University of Hertfordshire

Social

Interacts socially with a person

LBR iiwa
Kuka

Cooperative

Cooperates physically or socially with a person

EZ-10
Easy Mile
Robosoft

Operative

Operated or commanded by a person

Apple Gripper
Festo

Parallel

Works independently alongside a person

B-Droid
Warsaw University of Technology

Minimal

Independent, unlikely to contact a person

Smart Platform
Ocado

(None)

Protected from contact with a person

LOWER

Methodology

- Ethnographic fieldwork among roboticists and affected stakeholders to explore value systems on a case study basis
- Socio-dramas to bring new perspectives to the SSH and robot community
- Mini-Publics to engage citizens in robot developments

CASE STUDY APPROACH

A semi-structured approach that gives rich data on specific contextualized issues, especially fit for ethnographic work.

Not meant to be representative, but to unfold variation and complexity and to achieve in-depth knowledge of local context.

An explorative and cummulative approach.

THE VARIATION APPROACH

Aim:

- Seeking variation in 10-16 cases
- Call forth ethical issues across variation

Classifications of robots:

- By type
- By functions
- By other?

Initial approach to the field

Case selection based on robot mapping and seeking variation in:

Geography; national heavy and light involvement in robotics (robot-developers/ robot user countries)

Type of robot; industrial, agricultural, social, service

Function/application;

Sector; health, education, industry, service,

Human proximity; physically, mentally and socially, effect on wider community

Technological readiness level

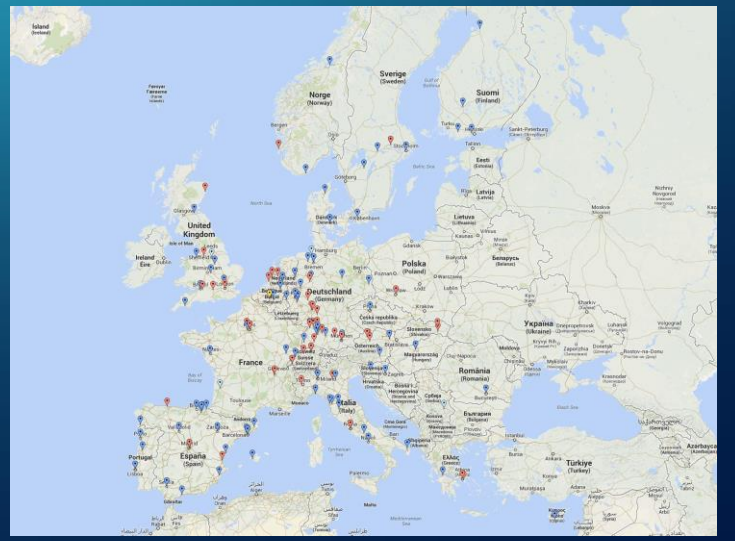
ROBOT MAPPING

State of Robotics:
Of over 250 euRobotics members, 52 are German organizations, indicating that Germany is invested in SPARC, Horizon2020, and the field of robotics under the EU.

Among Robotics Today's 200 members, 47 are German companies, indicating that Germany is also highly involved in the private robotics community.

Thus far, we have mapped all of the euRobotics members and have begun to map the Robotics Today members.

Stuttgart is a main 'hub'



Expected impact

Involve affected stakeholders in design processes already in the idea-generation phases through collaborative learning between social scientists and robot designers.

Make robots more ethical and relevant for humans and society.

REELER ROADMAP

The main outcome of REELER is a research-based roadmap presenting:

- a) ethical guidelines for Human Proximity Levels,
- b) prescriptions for how to include the voice of new types of users and affected stakeholders through Mini-Publics,
- c) calling forth assumptions in robotics through socio-drama
- d) agent-based simulations of the REELER research for policymaking.

FEEDBACK ON EMPIRICAL RESEARCH

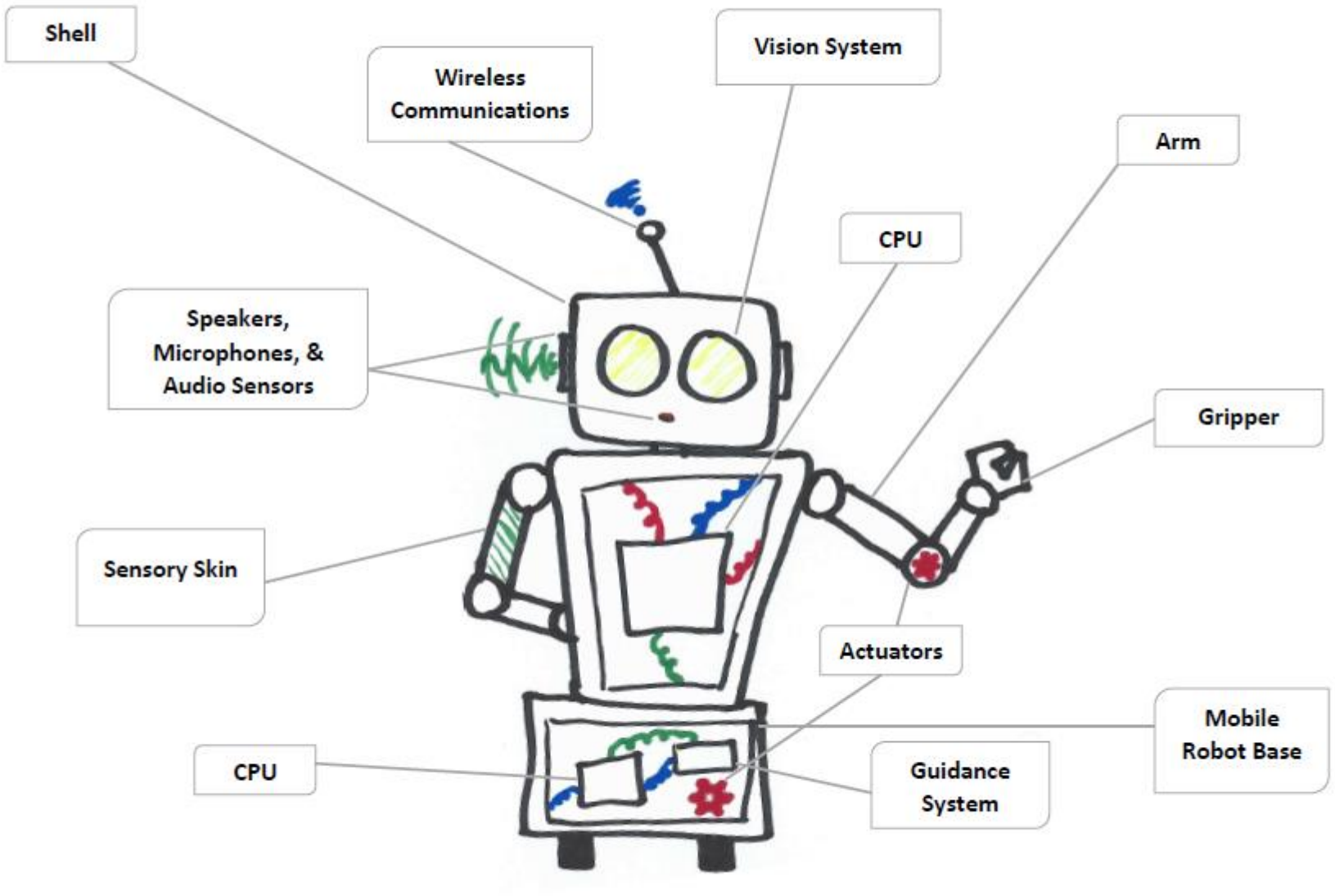
Initial finding:

Robots are highly distributed technologies, and thus implies highly distributed ethical responsibility.

Question:

What is the implication of highly distributed ethical responsibility, seen from a roboticist perspective?

The robot is a distributed technology



Where is ethical responsibility in a distributed technology?

REELER

Shell: 3D-printed in-house by PARTNER 1 in GERMANY

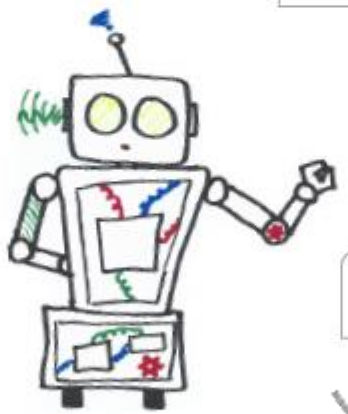
Wireless Communications: Purchased from supplier in KOREA

Vision System: Purchased from developer in DENMARK and adapted in-house

Arm hardware: Purchased from manufacturer in GERMANY
Arm software: Adapted from ROS (worldwide - online)

CPU hardware: Purchased and adapted in-house
CPU software: In-house

Speakers, Microphones, & Audio Sensors: Purchased from supplier



Gripper: Purchased from manufacturer in GERMANY

Sensory Skin: Developed by Arm manufacturer in collaboration with university in GERMANY

Actuators: Purchased from supplier in KOREA

CPU: Purchased by PARTNER 2 from supplier in USA

Guidance System: Developed in UK in collaboration with PARTNER 2

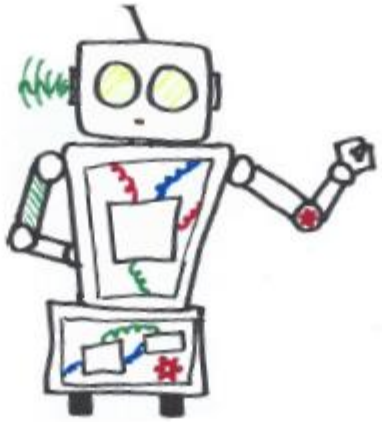
Mobile Robot Base: Developed separately by PARTNER 2 in UK

When do ethics come into question?

At conception?

Prototyping?

Applied research?



When it goes to market?

Application and integration?

Software development?

After a problem arises from use?

Who is liable when something goes wrong?

Manufacturers or suppliers of components?

University researchers?

Institution which purchased the robot?

Professional users?

Robot developer?

Institution which sold and implemented the robot?

Consumer users?

SOCIODRAMA

- Sociodrama born out of Psychodrama is a trilogy of *Drama* (the imaginative exploration of the human condition), *Socio* (the interrelatedness of humans and their environments) and *Psychotherapy* (a reflective process of exploring a person's life story).

SOCIODRAMA

- Sociodrama that emerged from *psychodrama* psychotherapy practice (Moreno 1932).

- Sociodrama helps groups work in an engaged creative and spontaneous explorations of wider cultural and philosophical issues and themes, such as those being examined in the research.

SOCIODRAMA

- In the action through Sociodrama we can learn to speak as the other in a dialogical encounter with them, whether they be a person, a moral, a robot or ethical question.

CASES AS SOCIODRAMA

- We want to use *Sociodrama*'s extraordinary potential to explore an issue from multiple perspectives without the constraint of reality to enable a deepening of understanding each other and the questions being examined in action.

THE EXPLORATIVE PROCESS
OF SOCIAL DRAMA / ROLE-PLAY

REELER

- The theme or question selection: the protagonist selection
- The warm up
- Grouping: pairing robots and themes
- The action
- The sharing
- Processing

SOCIAL DRAMA / ROLE-PLAY

- Think about what discussion you will invite us into
- Dramatise ‘your’ joint themes (e.g. Flobot, Communication and Learning, etc)
- Present your drama
- Engage in a dialogue where your topics are the protagonists and you are these protagonists while we – the audience - ask questions