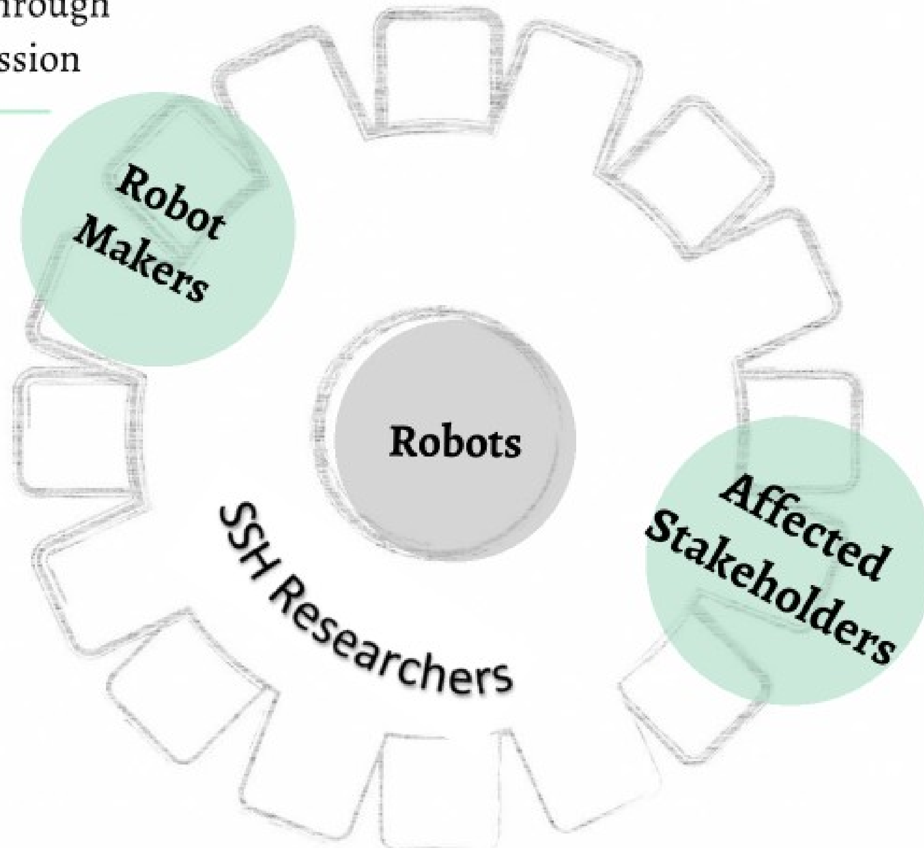
Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

Mini-Publics: A new road to responsible robotics

Cathrine Hasse
Professor of Anthropology
Aarhus University

REELER



Mini-publics

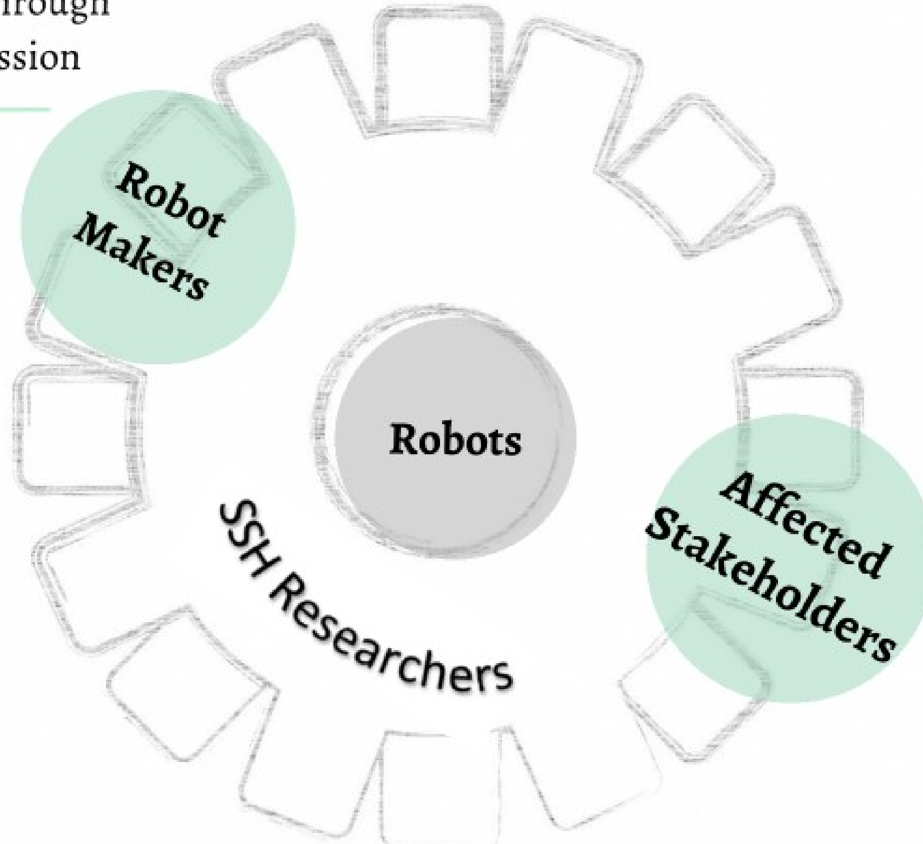
Enter text here, press +Page (lower left) to add a new slide

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

Mini-Publics: A new road to responsible robotics

Cathrine Hasse
Professor of Anthropology
Aarhus University

REELER



REELER

Responsible Ethical Learning with Robotics

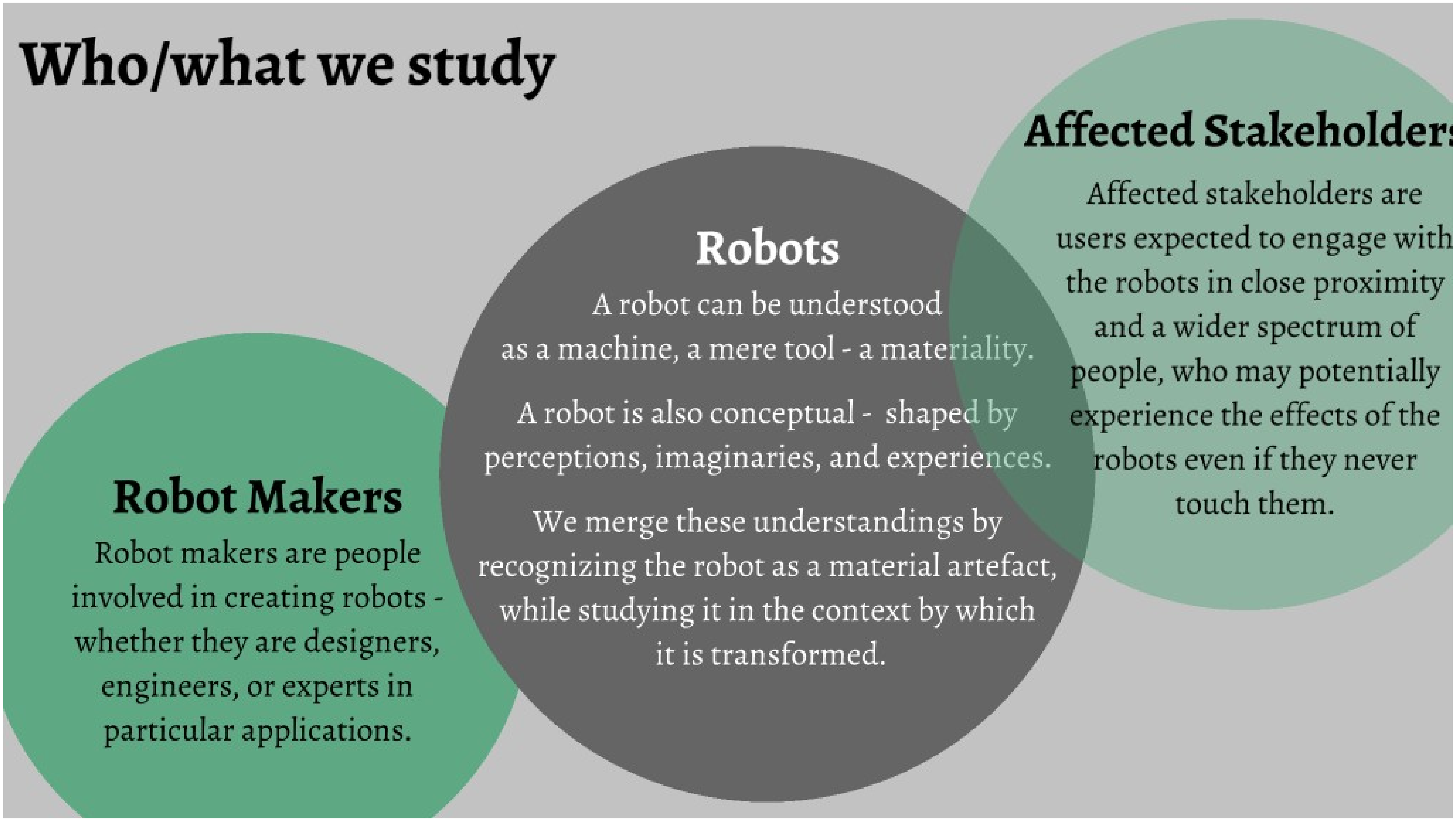
REELER is a new H2020 project funded by the European Commission with 1,998,265 EUR from the 1st of January, 2017 – 31st of December 2019. Its main objective is to develop the REELER Roadmap for responsible and ethical learning in robotics.

Research Approach

Research Methodology

AARHUS UNIVERSITY Ab.Acus DE MONTFORT UNIVERSITY LEICESTER UNIVERSITY OF HOHENHEIM 1818

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731726"



Who/what we study
Robots
A robot can be understood as a machine, a mere tool - a materiality.
A robot is also conceptual - shaped by perceptions, imaginaries, and experiences.
We merge these understandings by recognizing the robot as a material artefact, while studying it in the context by which it is transformed.
Robot Makers
Robot makers are people involved in creating robots - whether they are designers, engineers, or experts in particular applications.
Affected Stakeholders
Affected stakeholders are users expected to engage with the robots in close proximity and a wider spectrum of people, who may potentially experience the effects of the robots even if they never touch them.

Research Strategy

The REELER project uses a five-pronged approach, building on a relational ontology, to study the future impact of robots:

1. Social scientists (ethnographers) follow the robot makers and explore their design processes and their perceptions of robots and users. These processes are often instrumentally described, using terms like 'technological readiness levels' (ref).

2. Social scientists (ethnographers) follow what we call 'affected stakeholders' and explore their work, their daily lives, and their perceptions of robots.

3. Through a case study approach, centered on particular robots, REELER connects the analyses of robot makers and affected stakeholders, giving voice to affected stakeholders about how they would welcome the robots, designed by the makers, in their everyday lives.

4. "Giving voice" includes the presentation of ethnographic data at robot-makers fora, such as the European Robotics Forum, but also through outreach research activities: Robot Expert Panels (REPs) and Social Dramas. REELER hosts mini-publics, where affected stakeholders' voices can also be heard and gathered.

5. Finally, connecting insights from all of the aforementioned approaches, and joining these with computer models and validation tools, REELER will present to the European Commission a general REELER Roadmap for ethical learning with robotics (in 2019).

Research Methodology

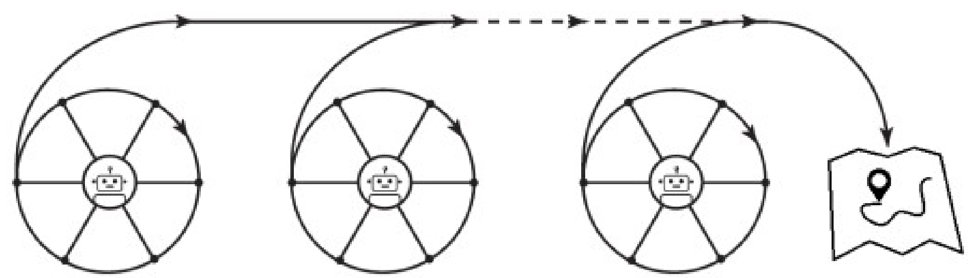
Case Studies

Ethnographic Fieldwork

Database Searches

Outreach Activities

The REELER methodology uses a case-study approach, carried out in rounds of ethnographic research. The research is informed by database searches. The data is presented to robot makers and affected stakeholders through outreach research activities.



We join together robot makers, affected stakeholders, and politicians over the course of the project. Our research output includes computer models and validation tools and the REELER roadmap for responsible, ethical robot design.

Case Studies

The REELER project utilizes a case study methodology that incorporates cases on the basis of variation within the field of robotics (robot type (application/sector), country, human-proximity, development setting (university, start-up, etc.).

Each case is drawn with a particular robot as its center and engages those around the robot, including roboticists and other affected stakeholders. In this way, each case can be seen as multi-sited, mapping the network of people affecting and affected by the robot and exploring these threads.

The main aim is not to address the particular concerns surrounding each robot, but to elicit, from these concerns, some general issues regarding collaboration and ethics. From the findings, REELER would develop some guidelines for future research and projects with the hope to benefit roboticists and society at large.

Ethnographic Fieldwork

Case studies can involve both qualitative and quantitative data collection methods. A focal point of REELER's research is to observe and interview people who are, directly or indirectly, in contact with robots. We have chosen ethnographic fieldwork as our main research/data collection method since knowledge about the use of, or experience with, robots in real-life settings is necessary to understand how robots impact humans.

The methods used in our ethnographic fieldwork are:

- Participant observation
- Qualitative interviews
- Visual media
- Field notes
- Document analysis (internet research)

Database Searches

In order to develop common ground within the project, we performed comprehensive literature searches and completed reviews of relevant concepts and topics. These reviews have informed our understandings of the major subject areas to which our research will contribute.

We also looked for patterns in patent and other database searches, in order to understand the state of robotics from economic and academic perspectives.

Outreach Activities

Two of REELER's goals are a) to provide roboticists with tools for engaging with ethical issues related to robot design and implementation and b) to bring closer promixity between the robot community, society, and policy-makers. To achieve these goals, we host outreach research activities: Mini-Publics, Robot Expert Panels, and Social Dramas.

Mini-Publics are democratic participation forums, where affected stakeholders have the platform for bringing their voices to robot makers and policy-makers.

Robot Expert Panel (REP) workshops offer invited robot makers a chance to gain new perspectives on their own R&D and robot technology from their colleagues.

Social Drama is an explorative, perspective-taking exercise that allows researchers to unfold key REELER concepts, such as human-robot proximity, with the roboticists.

These two activities provide REELER the opportunity to share feedback from affected stakeholders. All three of these activities (which are built upon ethnographic data), combined with our research outputs, are ways in which REELER researchers join the worlds of robot makers, affected stakeholders, and policy makers.

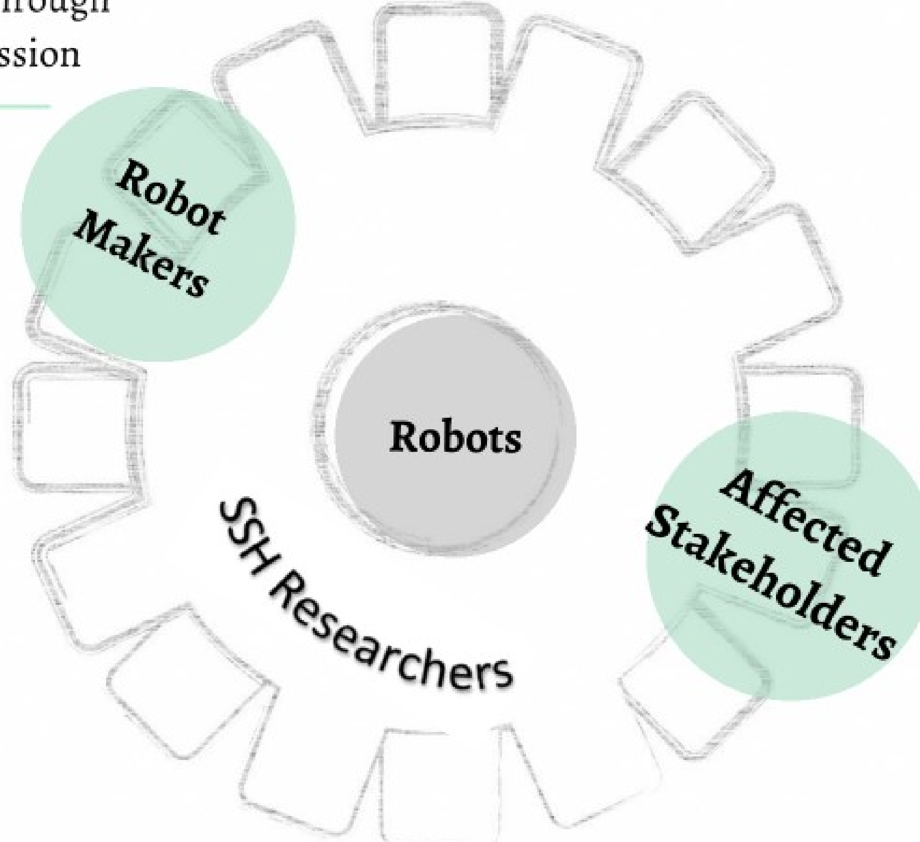
Robo-philosophy 2018 | University of Vienna | February 14-17

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

Mini-Publics: A new road to responsible robotics

Cathrine Hasse
Professor of Anthropology
Aarhus University

REELER



What is a robot?

Types of robots

Where do we encounter robots?

In ethnographic fieldwork, we look at the robot as a machine, but we also study how the robot is perceived, and we observe what the robot becomes through use.

Materiality or Concept?

REELER partner, Maria Bulgheroni defines a robot as having four subsystems: "sensors used to perceive the surrounding environment; actuators, e.g. servomotors, to interact with the environment; a control structure, i.e. the brain of the robot; the mechanical structure of the robot itself." ISO defines a smart robot as "capable of performing tasks by sensing its environment and/or interacting with external sources and adapting its behaviour". https://www.iso.org/obp/ui/#iso:std:iso:8373:ed-2:v1:en

Social scientists tend to focus on how users perceive the robot. Morana Alač et al. suggest that robot interaction is not rooted in hardware, but in the human interactions and social arrangements of the robot's environment. "The robot's social character thus includes its positioning in the space and the arrangement of other actors around it, as well as its interlocutors' talk, prosody, gestures, visual orientation, and facial expressions," (2011, 894).

Being?

In philosophical discussions, both in robotics and in the social sciences, the ontology of the robot is debated - is it capable of intelligence, interaction? Is it a tool, a smart machine, or something more? Tony Prescott (2017) argues that it doesn't matter whether a robot is actually just a tool or truly a social agent, but whether it is perceived as such, because real ethical issues will arise from these perceptions.

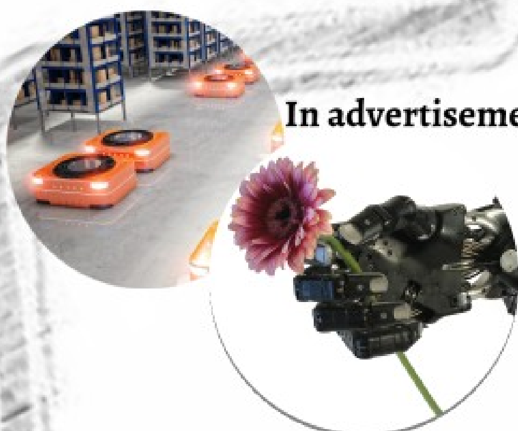
In popular media

Humans are exposed
to robots in various spaces.
Our engagements are mediated by our existing understandings, which may be influenced by our experiences with representations in popular media and in advertisements, and as material objects in robot-oriented settings or in existing human spaces.

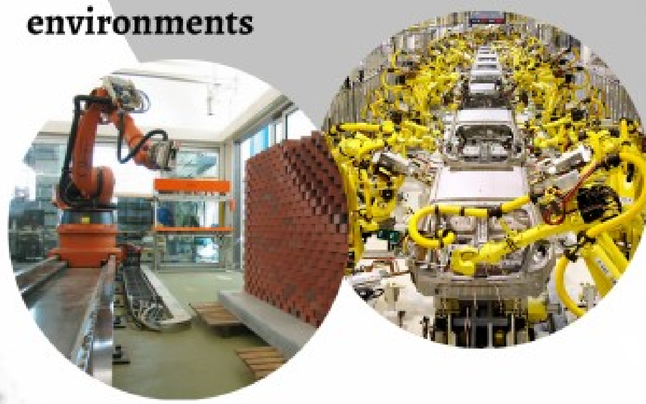
As ethnographers, we study the robots and the people engaged with these technologies in such very different spaces.

In human spaces

In advertisements



In controlled environments



Types of robots

Robots tend to be classified by sector, application, form, or function - or a combination of these qualities. Industrial robotics is the oldest and largest sector, often contrasted with service robots (every other type of robot). In REELER, we have already made cases on agricultural, social, educational, healthcare, industrial, and construction robots, and a case on autonomous cars.

Robo-philosophy 2018 | University of Vienna | February 14-17

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

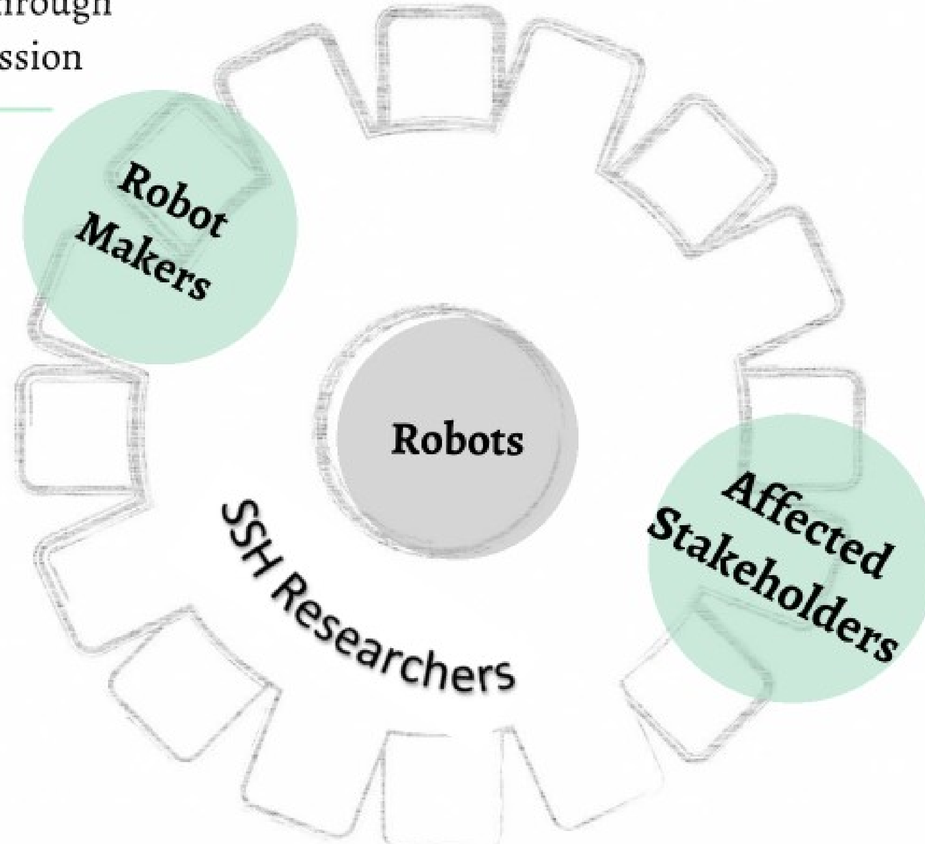
Mini-Publics: A new road to responsible robotics

Cathrine Hasse

Professor of Anthropology

Aarhus University

REELER



Robot Makers

We define robot makers as the people involved in creating robots - whether they are designers, engineers, programmers, or experts in a particular application area, such as medical doctors or farmers.

Who are they?

European and global distribution

Robots are made across Europe and globally, however, distribution is highly uneven.

https://www.therobotreport.com/map/

Certain countries dominate particular sectors. This is significant because it suggests that robots are cultural objects, shaped by the financial, political, social, material features of their settings.

For example, 75% of industrial robots come from China, Germany, US, South Korea, and Japan.

Nearly all logistics/warehouse robots are from the US. Most field (rough-world) robots are from Europe (nearly all agricultural and construction, and most underwater & military. Nearly all care robots are from Japan. Most cleaning robots come from the US. (IFR World Robotics reports)

Diversity among robot makers

As a distributed technology, built upon other technologies, robot development can involve a diverse group of makers, such as:

- Engineers (industrial, electrical, mechanical, software, biomedical)
- Software developers
- Programmers

- Designers (graphic, UX, industrial)
- Technicians
- System integrators
- HRI researchers

- Application engineers
- Experts in the area of application (farmers, medical specialists, car manufacturers)

Within these groups, there might be specialists in vision, manipulation, navigation, etc. Most robot makers we've encountered have been disproportionately male, and have completed higher education, usually in a technical science field.

Distributed technologies

A robot is a distributed technology, built upon existing technologies, existing configurations, and prior knowledge. The robot design is also often physically distributed across collaborators (engineers, programmers, designers, etc.) and across sites.

Because a robot continues to be adapted and transformed in implementation, use, and mis-/disuse, the robot's development is also shaped by system integrators, users, and the context the robot is placed in.

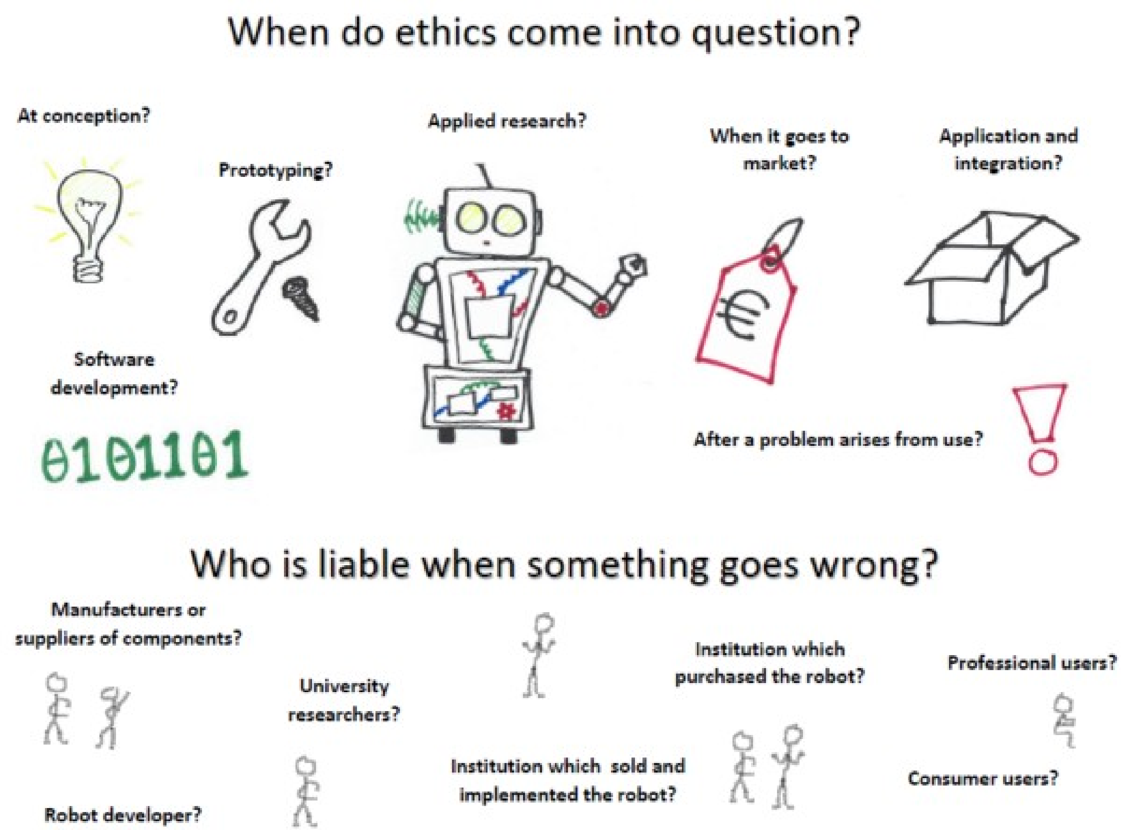
"...this software has been created through a process of shared decisions. Thus, everyone holds responsibility with regards to this matter." As a technology evolves, it becomes increasingly difficult to justify why and who to hold accountable for the robot conduct at all: **"In a moment when I create a robot with artificial intelligence that can learn, who is responsible for the decisions derived from learning? (...) These are open questions."**
(Excerpted from interviews with a robot maker)

Distributed ethics

Where is ethical responsibility in a distributed technology?

To answer this question, we turn to ethnographic fieldwork. Ethnographic methods are particularly suitable for exploring the complexity of participants' life-worlds.

In REELER, we examine the worlds of both the robot makers and the affected stakeholders.



Robo-philosophy 2018 | University of Vienna | February 14-17

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

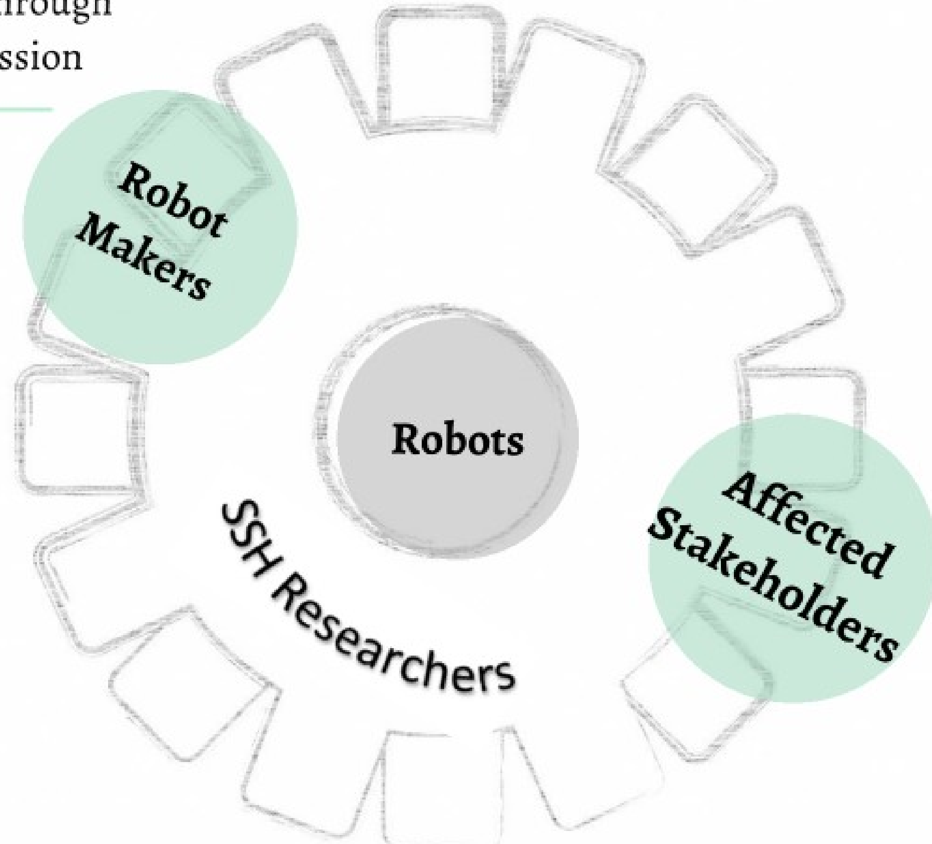
Mini-Publics: A new road to responsible robotics

Cathrine Hasse

Professor of Anthropology

Aarhus University

REELER



Affected Stakeholders

Affected stakeholders we define as both users expected to engage with the robots in close proximity and a wider spectrum of people, who may potentially experience the effects of the robots even if they never encounter them directly.

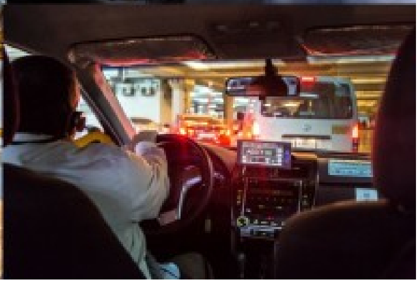
Who are they?

Who are they?

The affected stakeholders in our cases were selected (or self-identified) because of their proximity to robots - that is, the likelihood that their lives would be impacted by a robot from one of our cases.

They live in European countries, but come from multiple continents. They are farmers, fieldworkers, caregivers, construction workers, delivery drivers, cleaners, taxi drivers, factory workers, care recipients, union representatives, school children, teachers, parents. There is variation across age, gender, socioeconomic status, nationality, occupation.

The aim in this study, is to bring a plurality of voices to the design of robots.



Human Proximity Spectrum

While these are not actual cases in REELER, they exemplify variation in (physical) proximity, which was one factor we considered in selecting robot cases. REELER would like to expand the notion of proximity to include social and relational proximity, because we have seen that affected stakeholders exist beyond the reach of physical proximity.

'Giving voice' to affected stakeholders

One of the most significant contributions this project makes is to give voice to affected stakeholders, including those who may fall outside of a typical user group.

An affected stakeholder tasked with cleaning hotels in Portugal shared in an interview:
"I fear the robots will change our possibilities to earn a livelihood – but I do not think it can take my job." This person did have an interest in robots relieving them of certain tasks, like folding towels and moving furniture.

Another affected stakeholder, a North African/Spanish fieldworker did not fear replacement, either:
"To lose a job, no I do not think this. Because if this comes here, I can use it as part of my work but what happens when you have so many hectares with a lot of work people who work by hand, it is easier than this [machine]. This way is slower. With the hand it's more/ because for example what my boss can earn with us by hand, he cannot earn the machine." However, in the same case study, another worker expressed concern that agricultural robots would cost them their livelihood, and suggested that workers would destroy the robot to avoid losing work and going hungry. Indeed, we have collected data on robo-sabotage in situations where workers resisted implementation.

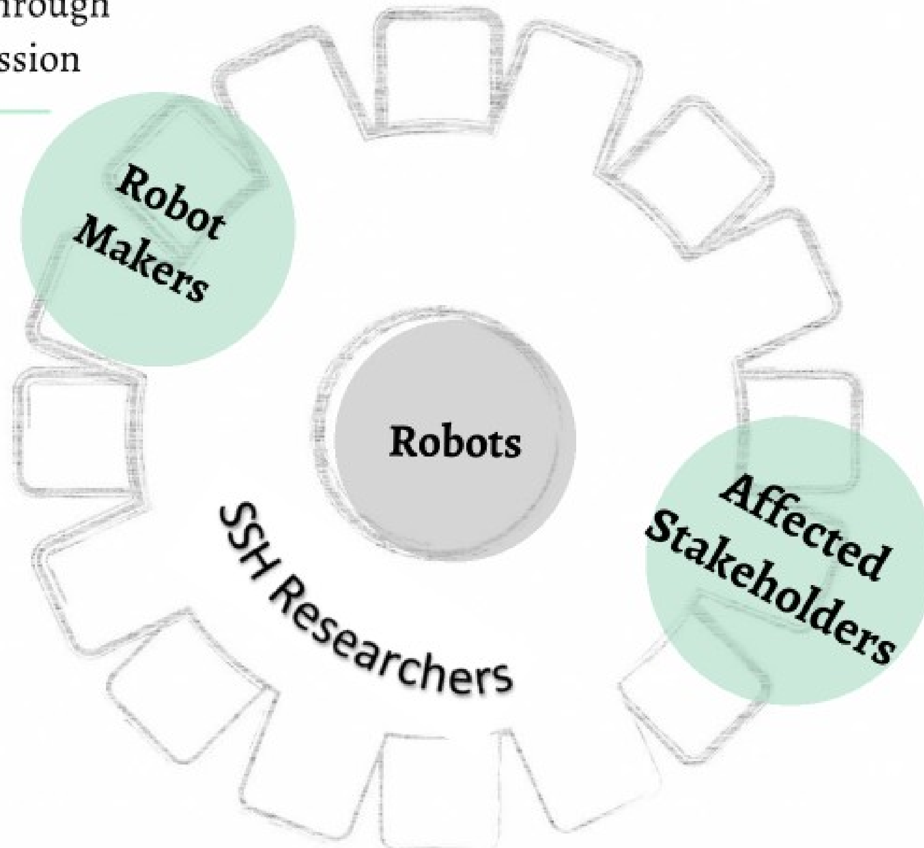
In REELER, we connect these voices with actual economic models, real-life situations, and bring these voices to robot makers and policy makers.

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

Mini-Publics: A new road to responsible robotics

Cathrine Hasse
Professor of Anthropology
Aarhus University

REELER



Analytical findings

In creating each case around a robot, and exploring both the robot makers' and the affected stakeholders' engagements with the robot, we aim to bring together these seemingly separate worlds, giving voice to the affected stakeholders, and encouraging more ethical design practices.

From our first round of fieldwork, we have begun to identify patterns in the empirical data, across robot cases. Certain ethical issues arose repeatedly. While these are just preliminary findings, they illustrate the need for this kind of research.

Inclusion/ Exclusion

Imaginaries

Ideas and Beginnings

Dehumanization

Education

REELER

Inclusion/Exclusion

Across our cases, we have seen issues of inclusion or exclusion - where the design of the robot accommodated particular users, while neglecting others.

For example, a particular robot required the user to follow written instructions, excluding workers who did not read that particular language and also those who were illiterate.

One affected stakeholder expressed discomfort when using a wearable robotic device:
"Well, what I think is, it takes up a lot of space. So, even for me, my breasts are squeezed. You don't have to be particularly large and have breasts or anything, it is simply too large."

Imaginaries

We have noticed that robot makers' perceptions of users, and the media representations the robot makers produce, tend to contrast with affected stakeholders' experiences.

For example, at one conference, a logistics robot introduced would reduce the variety of tasks a single worker would do, reportedly relieving the worker of burdensome tasks.

Ideas and Beginnings

New robots come from existing robots/technologies. Funding also directs robot development. It has seldom been the case that a robot emerged in response to an affected stakeholders' problem or from observed human needs.

Dehumanization

Dehumanization occurs when the human condition is transformed. This has occured through the transformation of human spaces (enveloping), human sociality, or human activities. It results in a reduction of human complexity through standardization.

For example, a particular agricultural robot required changes to the plant itself - changes that suited the machine harvester, not the manual harvester. Also, the work itself becomes support work for the robot (offloading harvested product), reducing the variety of tasks.

Education

Workshop 8: Exploring Ethical Responsibilities Through Democratic Participation and Expert Panel Discussion

Mini-Publics: A new road to responsible robotics

Cathrine Hasse
Professor of Anthropology
Aarhus University

REELER