



# MINI-PUBLIC II: Robotter og det meningsfulde arbejdsliv Arbejdermuseet, København 27 November 2018



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Fremtidsteknologi,  
kultur og læring



[www.reeler.eu](http://www.reeler.eu)

REELER is a collaboration between researchers from the fields of anthropology, learning, robotics, philosophy and economy. Together, we aim to align future robot designs with empirically identified societal needs and concerns.

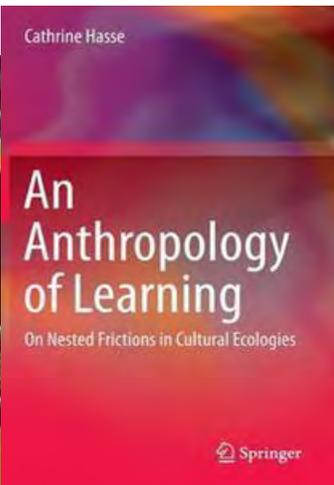
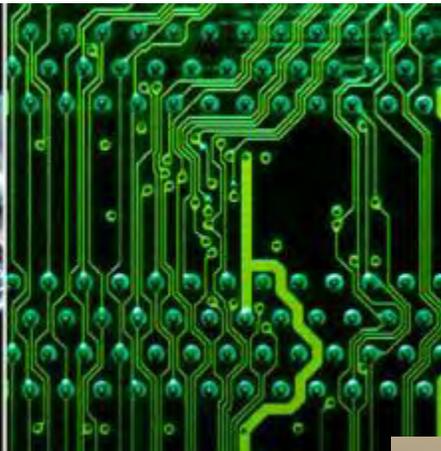
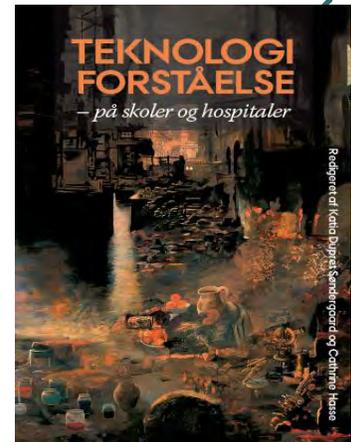
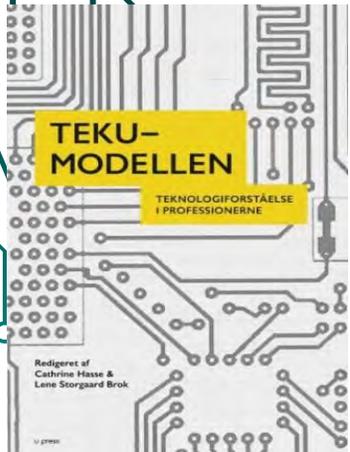


TEKNOLOGIFORSTÅELSE



# FUTURE TECHNOLOGY, CULTURE AND LEARNING

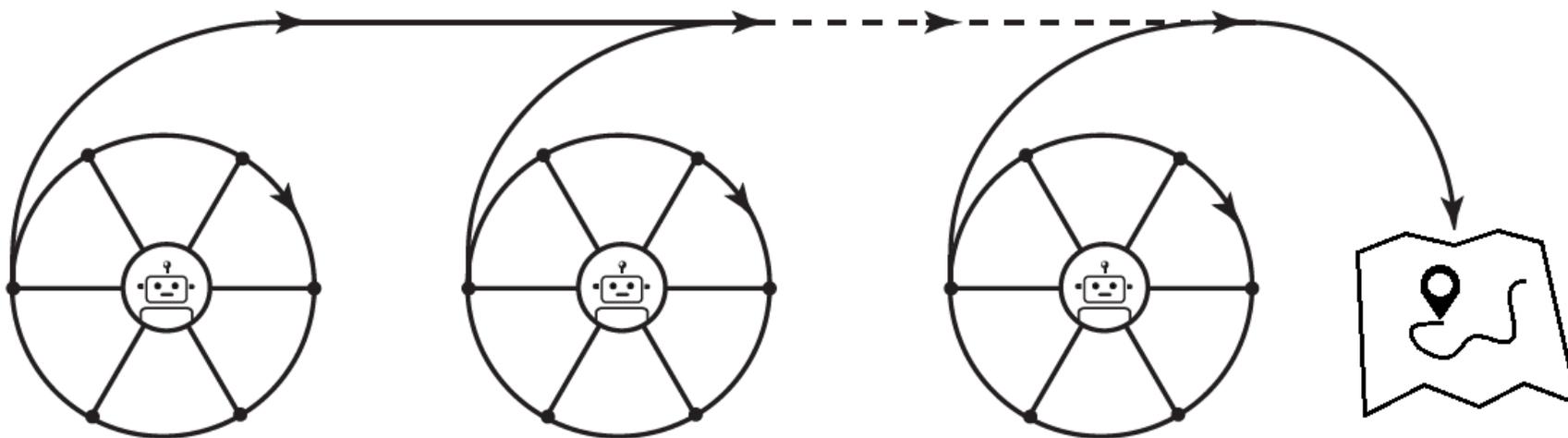
Interdisciplinary research focusing upon research at the convergence of emerging technology and cultural learning processes.



<http://edu.au.dk/en/research/research-areas/future-technology-culture-and-learning/>



# REELER Responsible Ethical Learning with Robotics



Feltarbejde periode1

Feltarbejde periode 2

Feltarbejde periode 3

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Roadmap



## Who/what we study

### Roboticists

Roboticists are people involved in creating robots - whether they are designers, engineers, or experts in particular applications.

### Robots

A robot can be understood as a machine, a mere tool - a materiality.

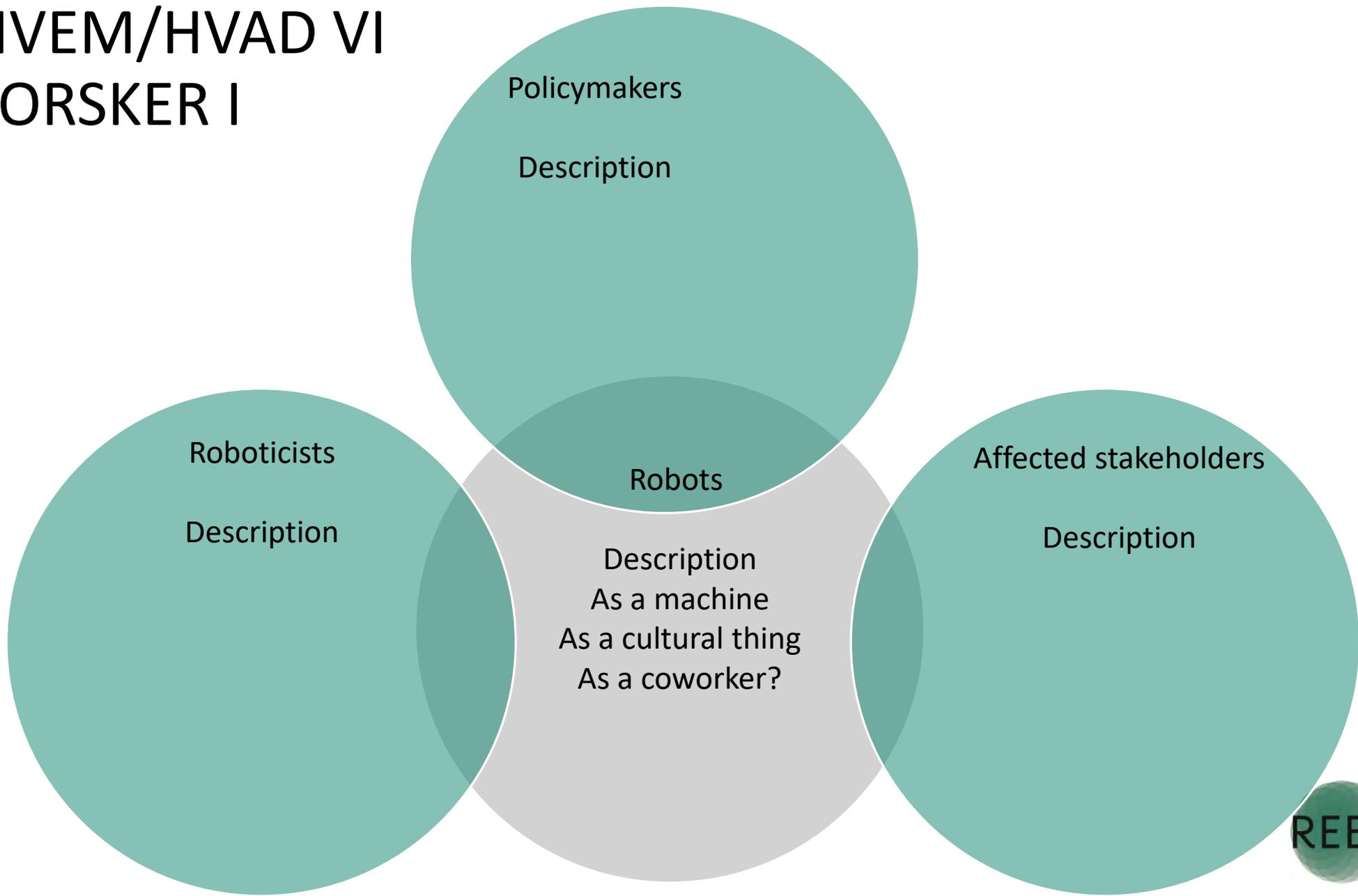
A robot is also conceptual - shaped by perceptions, imaginaries, and experiences.

We merge these understandings by recognizing the robot as a material artefact, while studying it in the context by which it is transformed.

### 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.

# HVEM/HVAD VI FORSKER I



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# FELTARBEJDE I REELER PROJEKTET

## Application sectors

(According to SPARC's Multi-Annual Roadmap for Robotics in Europe, with reference to Horizon 2020 Call ICT-2017)



*Transport and Logistics:*  
Autonomous transport (HERBIE),  
Logistics (WAREHOUSES)



*Commercial:*  
Construction (WIPER),  
Service (BUDDY)



*Manufacturing:*  
Production (COOP),  
SME Manufacturing (COBOT)



*Healthcare:*  
Rehabilitation (REGAIN)



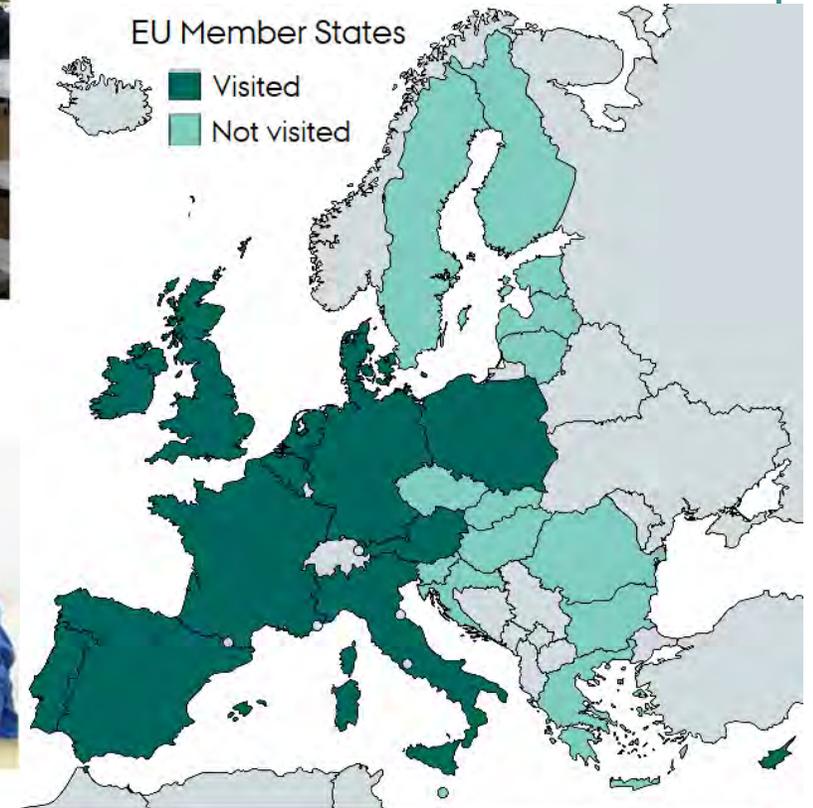
*Agriculture:*  
Harvesting (SANDY)



*Civil:*  
Infrastructure (OTTO),  
Cleaning (SPECTRUS)



*Consumer:*  
Education (ATOM)



# TOOL FOR RELATIONAL AGENCY ALIGNMENT: **MINI-PUBLIC**

## **Aim:**

- 1) to include the voice of new types of users and affected stakeholders and bring them to roboticists and policymakers, narrowing the current proximity gap between them;
- 2) to increase public knowledge about robots and their effects.

# TOOLS FOR RESEARCH & ALIGNMENT: MINI-PUBLIC (ARRANGED IN WP3, ANALYZED IN WP5)

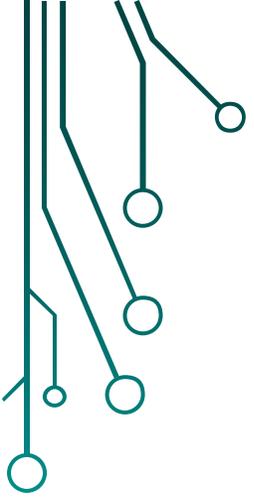
## Outcome:

The opportunity to receive factual, unbiased information about the topic from different perspectives, such as economic issues, technological and social issues, was very welcomed among the general public.

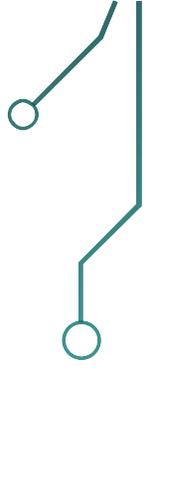
For decision-maker it also seemed to be an interesting eye-opening event.



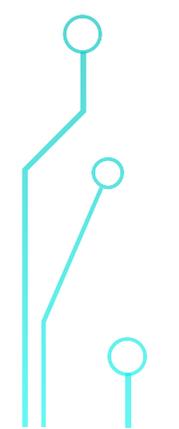
*Figure 1: The table facilitator organizes the group responses during the deliberation process and discusses the issues with participants.*



MENTI --



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# VIL ROBOTTER OVERTAGE JERES JOBS?

**OSBORNE & FREY**  
Robots will take your jobs.

REELER

# VIL ROBOTTER OVERTAGE JERES JOBS?

In purely quantitative terms, 75 million current job roles may be displaced by the shift in the division of labour between humans, machines and algorithms, while 133 million new job roles may emerge at the same time.

Source: The Future of Jobs Report. 2018. World Economic Forum



# ROBOTS OVERTAKE YOUR TASKS

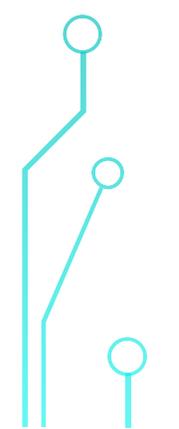
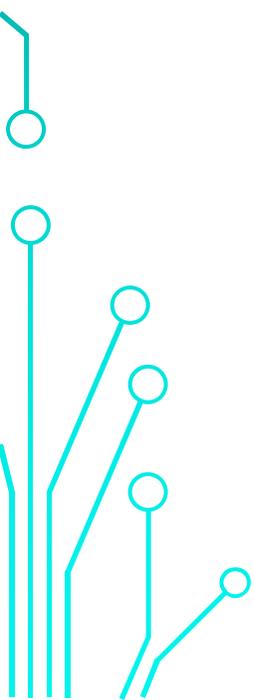
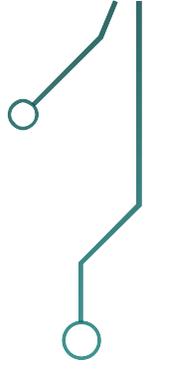
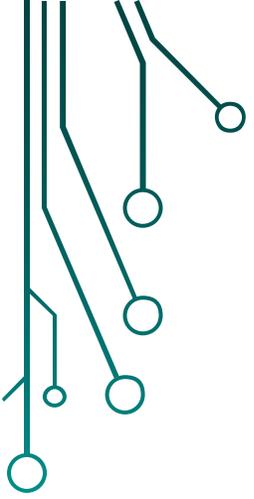
## Growing

- 1 Analytical thinking and innovation
- 2 Active learning and learning strategies
- 3 Creativity, originality and initiative
- 4 Technology design and programming
- 5 Critical thinking and analysis
- 6 Complex problem-solving
- 7 Leadership and social influence
- 8 Emotional intelligence
- 9 Reasoning, problem-solving and ideation
- 10 Systems analysis and evaluation

## Declining

- 1 Manual dexterity, endurance and precision
- 2 Memory, verbal, auditory and spatial abilities
- 3 Management of financial, material resources
- 4 Technology installation and maintenance
- 5 Reading, writing, math and active listening
- 6 Management of personnel
- 7 Quality control and safety awareness
- 8 Coordination and time management
- 9 Visual, auditory and speech abilities
- 10 Technology use, monitoring and control

Source: The Future of Jobs Report. 2018. World Economic Forum



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