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Ethical implications of persuasive social robots for promoting environmental sustainability

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AN OVERVIEW

- Robotics and sustainability
- Persuasive social robot
- Persuasion: factors and strategies
- Two case studies: the *Icat robot* and *Pepper*
- Social robots and the use of persuasion: an ethical discussion
- Conclusions

SUSTAINABILITY AND ROBOTICS

SUSTAINABLE DEVELOPMENT GOALS

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«Development that meets the needs of the present without compromising the ability of future generations to meet their own needs» (WCED, 1987).

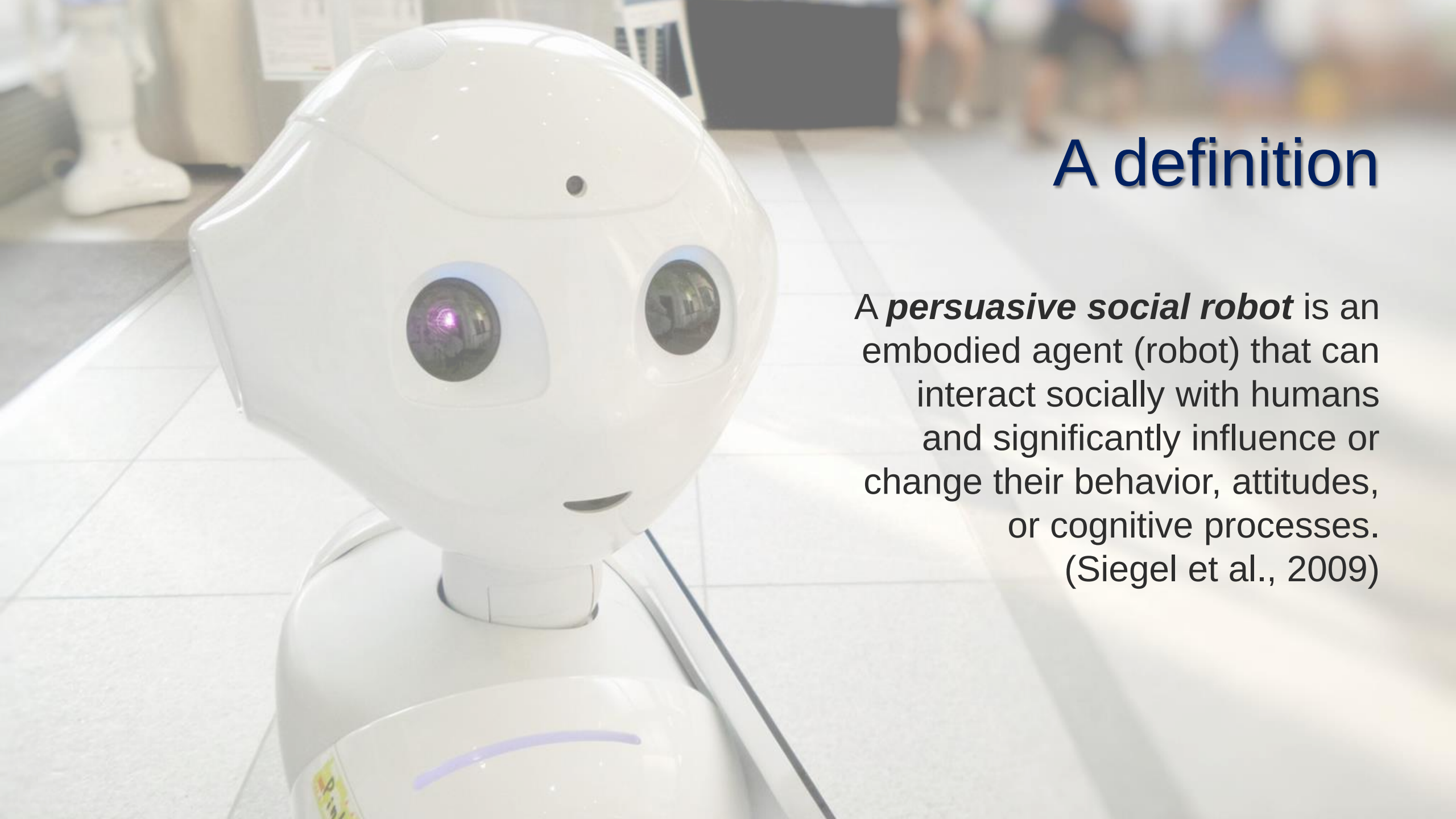
Robots can support sustainability across several areas

What is and can be the role of Social Robotics in achieving sustainable goals?

Social robots may provide a solution also for urgent issues such as sustainability

The Zenbo robot used in an experiment as a persuader to educate users on appropriate recycling (Lo et al., 2022)

Recent studies have shown how social robots may be used as persuasive agents to encourage people to behave in a sustainable way (Beheshtian, 2020)



A definition

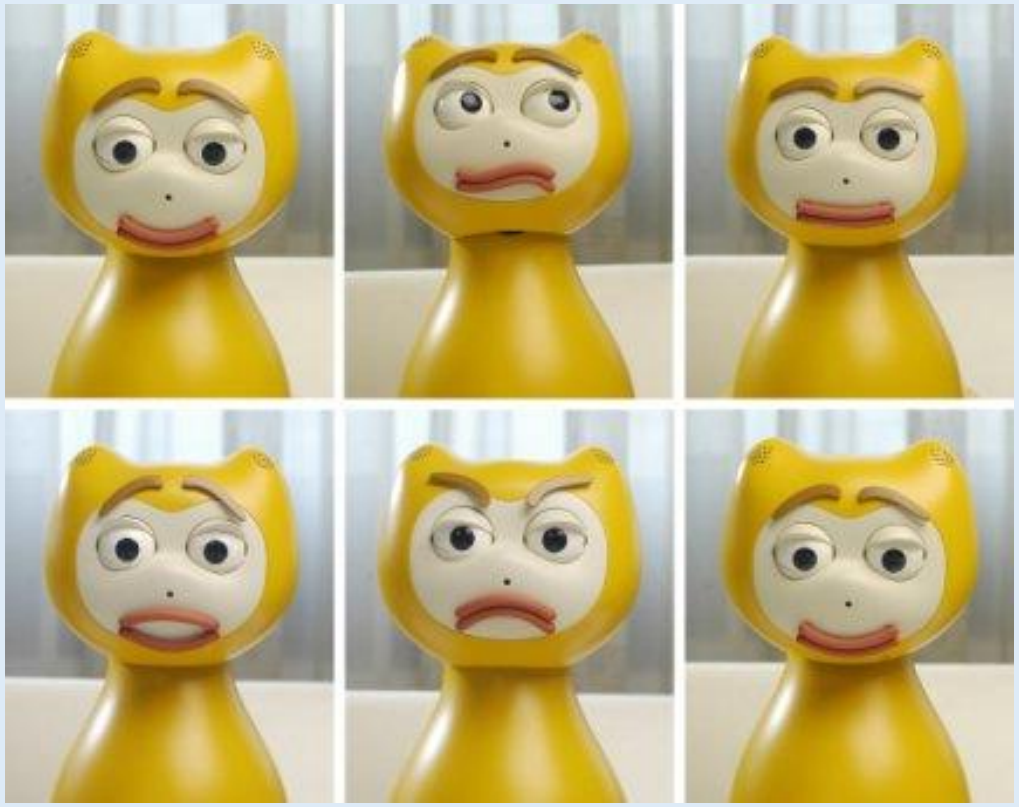
A ***persuasive social robot*** is an embodied agent (robot) that can interact socially with humans and significantly influence or change their behavior, attitudes, or cognitive processes. (Siegel et al., 2009)

Factors and strategies for improving persuasion

- Appareance
- Narrative strategies
- Social feedback
- Non-verbal behavior
- Emotions

CASE STUDIES

1) The Icat Robot



An iCat is a social robot manufactured by Philips Corporation. It looks like the (stylized) head of a cat, and can move its eyebrows, eyelashes, eyes, and lips, and play speech files and show emotional expressions.

It was used to incentivize energy conservation in people providing users with positive or negative feedback regarding their energy consumption with a simulated washing machine.

(Ham and Midden, 2014).

2) Pepper

Pepper is a 1.20 m tall humanoid robot equipped with wheels that allow it to move autonomously in the environment, and a tablet placed on its torso through which it interacts with humans. Designed by SoftBank Robotics, it is capable of sensing and expressing emotions via body posture.

It was used to propose a recycling game to children in order to change the attitude the kids have about recycling. (Castellano et al., 2021)

What are the findings of these studies?

- The use of social robots can have a strong persuasive effect in changing attitudes and behavior toward the environment
- They help to reduce energy consumption, contribute to the improvement of waste sorting by children and implement sustainable behavior
- Emotional strategy can have a high level of persuasiveness, also to promote sustainability issues

Is it ethically acceptable to use this kind of robots to influence people to act sustainably? Or can it be a form of manipulation?

Social robots and the use of persuasion: an ethical discussion

The ethical debate around the use of persuasion in social robots poses several issues:

- Manipulation
- Nudging
- Autonomy
- Paternalism
- Choice of targets

“As autonomy and freedom are fundamental values in western societies, users of PT (persuasive technology) have a prima facie basic right not to be influenced in ways that violate voluntariness, even not in cases where the intentions behind the PT and its aims are praiseworthy” (Smids, 2012).

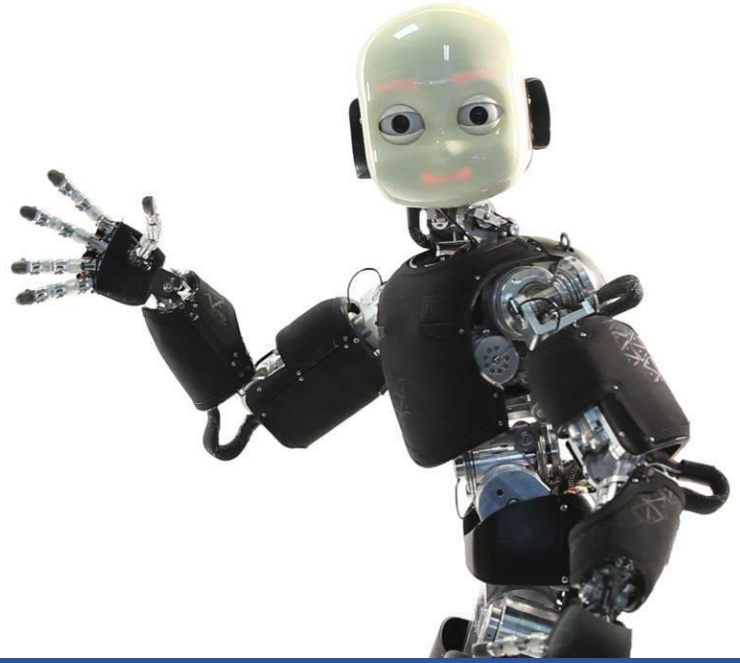
How to avoid ethical problems and enhance the applicability of this type of robot

- Regulate a robot's persuasive behavior using a shared ethical framework
- Incorporate ethics into robot design → *Ethics by Design* (Dainow and Brey, 2021)
- Includes the users in the design phases → *Participatory Design* (Forlizzi, 2007)

CONCLUSIONS

- This work suggests that persuasive social robots can be a valid tool for sustainability but more research is still required
- Greater collaboration between the field of robotics and ethics is necessary to face the challenge of a future in which humans and robots can work together for the environment

Thank you!



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