Implementing Care Robots, Realizing Care Values

Aimee van Wynsberghhe, PhD
Post-doctoral researcher, Ethics Advisor for CTIT
Overview

• A bit about myself and the work I am doing
• The topic for today: implementing care robots
• What are care robots and how to design (PhD work)
• Disconnect between intended and realized values
• Implementing the care robots
• Feedback/discussion
A bit about me

- Honors in Cell Biology - CSTAR
- Masters in Applied Ethics and Bioethics
- PhD in Robot Ethics: Designing robots with Care
- Currently doing a post doc at the University of Twente, Ethics Advisor for CTIT (Center for Telematics and Information Technology)

  – My goal has been to translate ethics for use by other disciplines
My work

• Different from ethics committee (my role is not to approve or disapprove but to find a way that design can continue WITH ethics)
• Pragmatic ethics – providing something for engineers
• Ethics in relation to technology - applied
• Value analysis
  – Making explicit values to draw out value conflicts
  – Translating values into design requirements
Why Ethics and Technology?

• New technologies confront us with new ethical dilemmas
  – Technologies and values
• Telecare, electronic health records, robots in healthcare
My PhD work – Ethics and Care Robots

• The use of care robots – robots in healthcare - to mitigate the demands of the healthcare system

• What will the impact on care be? To answer this we need to:
  – Understand what care means in context
  – Know what is needed
  – Be clear about the role and responsibility of the robot
My PhD work

• How to evaluate?
• Rather than focus on retrospective evaluations, what about prospective: how can we design care robots in the future so they embed care values?
  – Embedded values approach (Nissenbaum), Value-Sensitive Design (Freidman et al)
  – A framework for design; Care Centered Value Sensitive Design
The topic of today’s talk

• Main problem to address today is: the disconnect between intended and realized values
  – How can we ensure that the intended values and morality of a care robot (designed in an ethical way) will be realized in context?
    – Work-in-progress (!)
Disclaimer

• I am not arguing in favor of the use of care robots across the board; rather, there will be good and bad uses which need to be decided on carefully… avoid a technology push
But first... What is a care robot?
Ethics and Care Robots

• In my PhD I proposed a framework for the retrospective evaluation of care robots AND the prospective design of care robots
  • Van Wynsberghe 2012, 2012a, 2013
The Framework

1. Context (nursing home, home, hospital)
2. Practice (lifting, bathing, feeding, social)
3. Actors (nurse, patient, family member, hospital room, curtain)
4. Type of robot (enabling, replacement, assistive)
5. Manifestation of care values (attentiveness, responsibility, competence, reciprocity)

Van Wynsberghe 2012, 2013
Applying the Framework

1. Describe the practice in context with actors involved prior to the introduction of the robot (illustrate expression of care values, their significance and the relationship of practice to overall care)

2. Describe the robot (capabilities, appearance, interface)

3. Describe the resulting care practice with the addition of the care robot
Putting it to use

• Prospective Design of a robot…visit the hospital and speak with healthcare staff to learn about areas where a robot could assist as well as what happens in the context
  – The “Wee-bot” robot used for urine collection in pediatric oncology (van Wynsberghe, 2013)
The practice of urine sample collection

• Based on observations and interviews in Ontario, Canada
• Collection of urine sample in pediatric oncology requires safety clothing but there isn’t enough time
Robot Design – The “Wee-Bot”

- TUG robot platform – autonomous travel throughout hospital corridors and elevators, obstacle avoidance, human-operated to travel from one site to another
  - Assistive robot
Intended Values

- Safety and wellbeing of nurses
- Safety and wellbeing of patients
- Competence
- Chain of responsibility
- Human presence
- Attentiveness
Translating Values

• Robot with hand held device to drive the robot into the patient’s bathroom
• Nurse and patient safety and wellbeing
• Potential Problems
  – Lack of attentiveness, chain of responsibility, new and unnecessary skills of nurse?
Translating Values

• Autonomous robot to drive into patient bathroom and collect urine sample
  – Nurse and patient wellbeing and safety
  – Maintain attentiveness of the nurse – responsibility and competence

• Potential Problems – chain of responsibility, human presence
Solution

• Include retinal scan, voice or fingerprint recognition to ensure the nurse is recognized by robot upon arrival at patient’s room
  – Maintains attentiveness, chain of responsibility, wellbeing and safety of both nurse and patient, etc…
Disconnect between intended and realized values

• Translating values into design requirements does not ensure they will be expressed/realized in context
  – Biggest problem facing value design theories today
  – Intended values and uses don’t always match up with reality, what happens in context
Disconnect between intended vs realized values

- TUG robot used in oncology and a neonatal ward: same robot, same hospital, different ward = completely different impressions from users (hated vs loved)
- Intended context and use always in mind, designers don’t anticipate the differences from one ward to another so... it is necessary to specific and explicit in the design process and the implementation
Domestication vs Implementation

• The phenomenon of technology domestication explores how an artifact blends in with existing norms and meanings but also how the artifact co-produces new norms and meanings (currently with the daVinci surgical robot).

• The study of what happens but why would we do this if the robot has been designed with a specific use and morality in mind?
Implementation of Care Robot

- Make the intended uses, users and contexts of the robot explicit to the direct and indirect (if possible) users
  - Goes beyond technical implementation alone
  - Allows for critical reflection of care practices on a broad scale
- Focuses on a dialogical approach (care ethics)
How?

- Robot Ethicist – trained in robotics and practical ethics to understand both
- Go to the context with the robot
- Discuss with users – describe envisioned practice, context, users, uses
- Describe intended values in relation to uses etc.
Implementation

- Empowers users and maintains responsibility of the human care providers rather than the technology (one of the greatest fears of robots in healthcare)
- Recognition of the holistic vision of care (rather than separate tasks)
- Encourages reflection of roles
- Troubleshoot problems
Re-cap

• Designing robots to embed values so they can provide assistance while embedding the values of care

• The problem with this is that we can’t guarantee that those values will be realized in question

• To solve this, designers must be explicit about values, uses and contexts (proposed way to do this here)

• Added to this, we can focus on implementation of the robot – dialogue with users in context
Re-cap

• Question: How can we ensure that the intended values and morality of a care robot (designed in an ethical way) will be realized in context?
• Suggestion: Making explicit the intended values, uses and users in context through the design process right to the point of implementation (work-in-progress)
Thanks for listening!

• questions/comments/input
  – For more, see Aimeevanwynsberghe.com
References

• Hirano, T. ;. (2007). Generation of Human Care Behaviors by Human-Interactive Robot RI-MAN. (pp. 3128-3129). IEEE.
• Le Dante, C. A., Poole, E. S., & Wyche, S. P. (2009). Values as lived experience: evolving value sensitive design in support of value discovery. (pp. 1141-1150). New York, NY, USA: ACM.
References

- van Wynsberghe, A. (2012a) Designing robots with care: Creating an ethical framework for the future design and implementation of care robots. Enschede: University of Twente.

'UNIVERSITEIT TWENTE.'