



# Legal Issues Relating to Social Robots

## Case study: Johnny Five

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# Social Robots

- Defining the “social”
- Interaction through human social rules
- Can be humanoid, mechanoid, and zoomorphic
  - Studies outline their potential in use, for example, in elderly care (Kalmer and Ben Allouch, 2010), and the diagnosis of autism (Scassellati, 2005)
  - Personal care robots “*a service robot with the purpose of either aiding actions or performing actions that contribute towards improvement of the quality of life of individuals*”. ISO/NP 13482
  - Can provide: cooperation, assistance, teleoperation and entertainment

# Social Robots

- Case study: Johnny Five, a SAINT (Strategic Artificially Intelligent Nuclear Transport) Robot (Number 5)
- Key issues:
  - ❖ Safety standards
  - ❖ Liability
  - ❖ Robot rights?

# Safety Standards

- Increasing levels of flexibility and mobility required. There is a need to examine standards in relation to:
  - ❖ Safety standards– the notion of “mission-worthiness”
  - ❖ Design guidelines – building safety into design systems (Harper, 2010)

Need to examine:

- ❖ Physical Safety Standards – eg the avoidance of collisions/power surges etc (De Santis et al 2008)
- ❖ Behavioural, perhaps emotional, safety?

Need to predict both robot AND human behaviours.  
See: Salter et al (2010) on the “wildness” of child/robot interaction

# Safety Standards: The Standardisation Process

- Sub Committee 2 (SC2) “Robots and Robotic Devices” of Technical Committee 184 of the International Standards Organisation (ISO) focuses upon non-industrial robots. Within this, an Advisory Group (AG) on Standards for mobile service robots was established 2005.
- CURRENT IMPORTANT DEVELOPMENT: ISO/DIS 13482 Robots and robotic devices -- Safety requirements for non-industrial robots -- Non-medical personal care robot. These are still in development.
- These standards will focus upon (Harper 2010):
  - ❖ Tasks
  - ❖ Environmental Conditions
  - ❖ Hazards
  - ❖ Validation Tests

# Safety Standards: emotional safety

- *“A robot’s emotional impact is...important; a user should be able to trust a robot and feel safe using it.”* (Feil-Seifer et al, 2007)
- There is a need to measure trust, relating this to the human ability to rely upon the robot, even when vulnerable (Yagoda, 2012)
- Need to focus on level of automation, behaviour, dependability, reliability and predictability (Hancock, 2011)
- Emotion-based architecture is under development based on a number of functions:  
Regulative/Selective/Expressive/Motivational/  
Rating (Hirth, 2009)

# Safety Standards: The Future

- Working group on the development of ethical safety issues to develop standards in the same manner as those relating to hazards
- Need for a scale which addresses human information processing in relation to trust, highlighting potential variations
- Need to examine how trust/emotional based standardisation links into issues of liability

# Liability

- There is a need to build robots ethically
- Issues arise relating to agency and responsibility. There is a need to establish who is in control and when.
- A need to apportion blame between designer/programmer/end user
- Is there a need to develop explicit principles of robo-agency
- Could a concept of robo-personhood be developed? (Asaro, 2007)
- Could a robot ever have moral agency? Raises issues of responsibility and desert. Civil liability could be covered by insurance and criminal liability could extend to corporate owners following similar principles to the law relating to artificial legal persons. Involving those with an “artificial intelligence” in court proceedings could lead to a concept of constitutional rights (Solum, 1992)



# Liability

- Asimov's Laws – difficult to map onto motion behaviours
- Ultimately a robot is under human control
- There is a need to examine:
  - The conditions of control
  - The need for human control
- Potential superiority of robot actions (Enz et al, 2011)

# Robot rights?

- *“morality is primarily a domain of organic human persons—and possibly of other non-human organic beings to which personhood might be usefully attributed...a key element of the organic view is the claim that consciousness, or sentience, is at the root of moral status”* (Torrance, 2008)
- The notion of the robo-expanded self (Ramey, 2005)
- Ethical behaviour towards robots is an extension of how humans treat each other. (Levy, 2009)
- *“he who is cruel to animals becomes hard also in his dealings with men.”* (Kant in:

# Robot Rights?

- *“Nurturing a machine that presents itself as dependent creates significant social attachments”* (Turkle, 2006 p9)
- Paro, a “mental commitment robot”, was found to elicit high-levels of emotional attachment from owners
- The emotional bond felt for robots exceeds that for non-robotic objects. High levels of anthropomorphism and projection is found. (Scheutz, 2012)
- This projection may be similar to that felt towards animals in need and a reaction to what is perceived as pain may be due to our own experiences of pain. (Darling 2012)
- Do robots have a “soul”? Definitional issues: At what point does “disassembly” equal death?

# References

- Asaro, P (2007) Robots and Responsibility from a Legal Perspective Proceedings of the IEEE 2007 International. Conference on Robotics and Automation
- De Santis, A. et al An atlas of physical human–robot interaction Mechanism and Machine Theory 43 (2008) 253–270
- Feil-Seifer, K. et al (2007) Interaction Studies: Psychological Benchmarks of Human-Robot Interaction, 8(3), 423-429
- Hancock, P. et al (2011) A meta-analysis of factors affecting trust in human-robot interaction. *Hum Factors* 53(5):517–527
- Harper (2010) Towards the Development of International Safety Standards for Human Robot Interaction *Int J Soc Robot* (2010) 2: 229–234
- Hirth J, and Berns K (2009) Emotion-based architecture for social interactive robots. In: Choi B (ed) *Humanoid robots, in-tech*, pp 97–116
- Kant, I., *Lectures on Ethics*, translated/edited by P. Heath P., Scheewind, J. Cambridge University Press (1997),
- Klamer, T. and Ben Allouch, Somaya (2010). Acceptance and use of a social robot by elderly users in a domestic environment. *Proceedings of Pervasive Health 2010*, Munchen, Germany.
- Levy, D. (2009) The Ethical Treatment of Artificially Conscious Robots *Int J Soc Robot* 1: 209–216

- Ramey C (2005) 'For the sake of others': the 'personal ethics' of human-android interaction. In: *Proceedings of COGSCI workshop: toward social mechanisms of android science*. Stresa, Italy, July 25–26, pp 137–148
- Salter, T. et al (2010) How wild is wild? A taxonomy to characterize the 'wildness' of child-robot interaction *Int J Soc Robot* 2: 405–415
- Scassellati, B. How social robots will help us to diagnose, treat, and understand autism. 12th International Symposium of Robotics Research (ISRR). San Francisco, CA. Oct. 2005 <http://www.cs.yale.edu/homes/Scassellati/papers/Scassellati-ISRR-05-final.pdf>
- Scheutz, M., (2012) "The Inherent Dangers of Unidirectional Emotional Bonds between Humans and Social Robots", in: *Anthology on Robo-Ethics*, eds. Lin, B., Bekey, G., et al., The MIT Press .
- Solum, L. (1992) Legal Personhood for Artificial Intelligences North Carolina Law Review, Vol. 70, p. 1231
- Sibylle Enz et al (2011) Social Role of Robots in the Future—Explorative Measurement of Hopes and Fears *Int J Soc Robot* (2011) 3:263–271
- Takanori, S. (2012) Investigation on People Living with Seal Robot at Home Analysis of Owners' Gender Differences and Pet Ownership Experience *Int J Soc Robot* (2012) 4:53–63
- Torrance S (2008) Ethics and consciousness in artificial agents *Artif Intell Soc* 22(4)
- Turkle, S. (2006) „A Nascent Robotics Culture: New Complicities for Companionship“, Tech. Rep., AAAI
- Yagoda et al (2012) You Want Me to Trust a ROBOT? The Development of a Human–Robot Interaction Trust Scale Rosemarie *Int J Soc Robot* (2012) 4:235–248