Ethics in Human-Robot Interaction

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Motivation and Question

- Technology should be built, designed and made available only in so far it benefits humanity.
- Already the line is blurring between the machine and the human.
- Once robots can do what they please.
- Humans will have to figure out how to keep them from nasty things. (lying, cheating, stealing, others).

Our Questions:

- Can robots be trusted to know right from wrong?
- What are the situations in which it would be justified that a robot does not respect human will?
Backgrounds and Basics: Robots

- Robots are "just machines".
- Robots got their name in Capek’s play R.U.R (Rossum’s Universal Robots, 1921) [2].
- Currently, there are over one million robots.
- Serve different functions and are found in hospitals, factories and in our homes.
Backgrounds and Basics: HRI (Robotics)

- Human-Robot Interaction and its older sister discipline (HCI).
- Robotics is the science and technology of robots.
- Combination of many scientific disciplines especially (neuroscience and nanotechnology).
- In the 1950s, Isaac Asimov coined the term ”Robotics” [1].
- The three main laws of Asimov:
  1. A robot may not injure a human being either directly or through its intervention.
  2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.
  3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.
Why do we want to live with robots?

- **Production systems [6]:**
  - Industrial Robotics (Self-Driving Car).
  - Adaptive robot servants and intelligent homes.
  - Outdoor Service Robots (Search or Rescue).
  - Sex Robots (people fall in love with AI systems).
  - Network Robotics (Internet Robotics, Robot Ecology).
  - Robotics in Health care and life quality.
  - Military Robotics (Discriminate between options and be proportionate).
  - Education and Entertainment (Robot Toys, Educational Robots).
Ethics is about living the good life, known as “Moral philosophy”. “It’s about defining what is right and wrong”

Ethical concerns:
- “Vulnerable users”: elderly, children, disabled people…
- Emotions.
- Human-like (and animal-like) robot.
- Private life.
- Safety and Security.
Backgrounds and Basics: Ethics

- The so-called emerging technologies with common ethical issues [4]:
  1. Equality.
  2. Non-discrimination
  3. Autonomy
  4. Responsibility
  5. Privacy.
  6. Identity

- Therefore, ethics deal with the following points in Robots [7]:
  1. The ethical systems built into robots,
  2. The ethics of people who design and use robots,
  3. The ethics of how people treat robots.
The ethics inspiring the design, development and employment of Intelligent Machines (Robots).

The term Roboethics for “Robot-Ethics” was coined by Gianmarco Verrugio [3].

Officially proposed at the First International Symposium on Roboethics (San Remo, January-February 2004) Debate.

In 2005, EURON funded the Roboethics Atelier Project (Roboethics Roadmap).

The three main ethical positions of anthropologist Daniela Cerqui [4] :

1. Those who are not interested in ethics.
2. Those who are interested in short-term ethical questions.
3. Those who think in terms of long-term ethical questions.
Case Study (Ethics Into a Self-Driving Cars)

- Noah J. Goodall [8] proposed an important question:
  Can you program Ethics Into a Self-Driving Car?.
- Manufacturers and software developers will have to defend a car’s actions in ways unimaginable to today’s human drivers.
- All driving involves risk.
- Trolley Problem.

Volvo self driving car [9]
Case Study (Ethics Into a Self-Driving Cars)

- Controlling vehicle toward lane positioning by Google [10].
- “Judgment to break the law”.
- Google also patented an application of this type of risk management in 2014.
  - positioning in lane.
  - Change lane.

- The ethics of vehicle automation is a solvable problem.
- Other fields have handled comparable risks and benefits in a safe and reasonable way.

Example of automobile with an embodiment. [10]
The testing of fully automated vehicles is allowed in
- United Kingdom, Netherlands, Germany, Japan and United States.
- But in some parts of is explicitly legal without driver remains in the vehicle.

Google, Nissan, Ford, and Uber, said expect true driverless operation within 5 to 10 years.

Manage Ethics and Law together.

Finally, Automated vehicles still face a greater challenge.
Conclusion

- The discussion about the ethics of human-robot interaction as to eclipse the day-to-day ethical challenges facing HRI research, development, and marketing.
- Enter Roboethics, a field of robotic research that aims to ensure robots adhere to certain moral standards.
- We can now solve the questions of “Can robots be trusted to know right from wrong?”.
- The answer is not yet. And we’re not anywhere close yet.
- We have keep in mind that if robot not respect human we are in trouble.
- Our case study still imperfect.

But you can be sure, scientists are going to keep trying.
Literatures

Literatures

9. CHARLEY CAMERON. “Volvo Self Driving Car”,
    https://www.youtube.com/watch?v=TsaES--OTzM&t=150s.
Further Reading

1. Fiorella Operto. School of Robotics Italy: Roboethics: Social and Ethical Implications of Robotics January 2008
5. Philip E. Ross, Google Self-Driving Car May Have Caused an Accident 1 March 2016.
6. General Robotics and AI Conferences in David Feil-Seifer and Maja J Matari´ ,”Human-Robot Interaction”
Further Reading


Thanks for your attention.
Questions .. ?