Ethics in Human-Robot Interaction

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Intelligent Robotics Seminar

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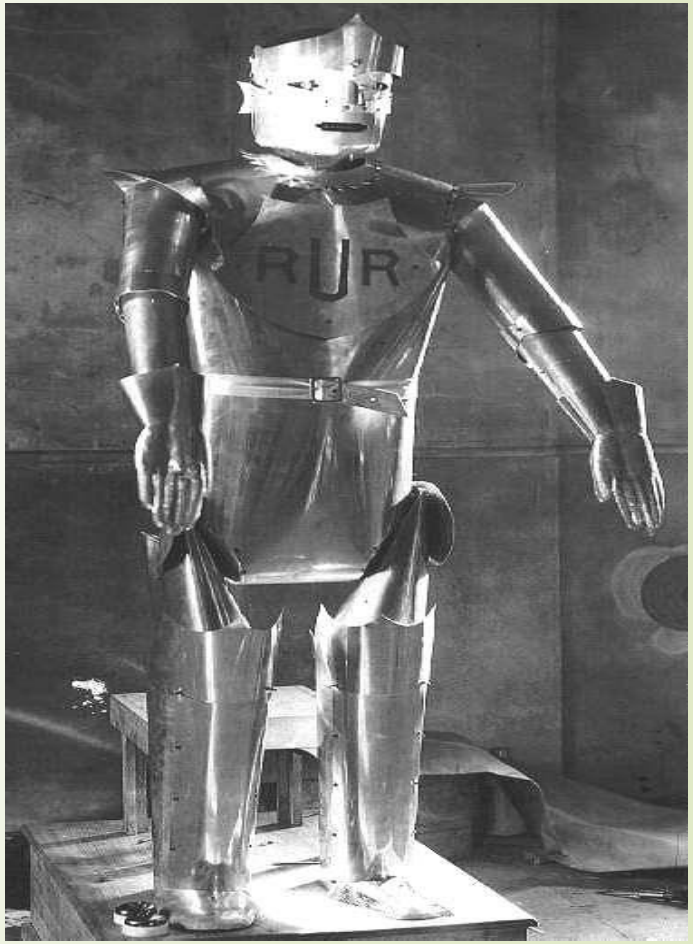
Motivation and Question

- 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 ˆ 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.



The first Robot in the world (RUR) [2]

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.

Backgrounds and Basics: HRI (Robotics)

Why do we want to live with robots?

- Production systems [6]:
  - Industrial Robotics (Self-Driving Car).
  - Adaptive robot servants and intellgent 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).

Backgrounds and Basics: Ethics

- 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.

Roboethics (Robots Ethics)

- 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?.

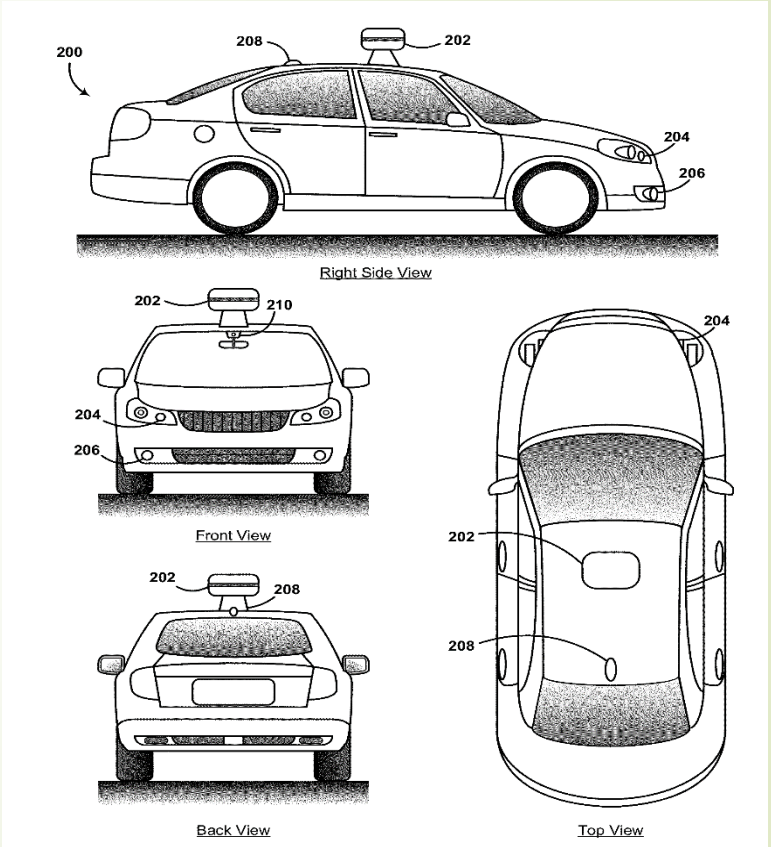
- Manufacturers and software developers will have to defend a car's actions in ways unimaginable to today's human drivers.
- All driving involves risk.
- Trolley Problem.

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.

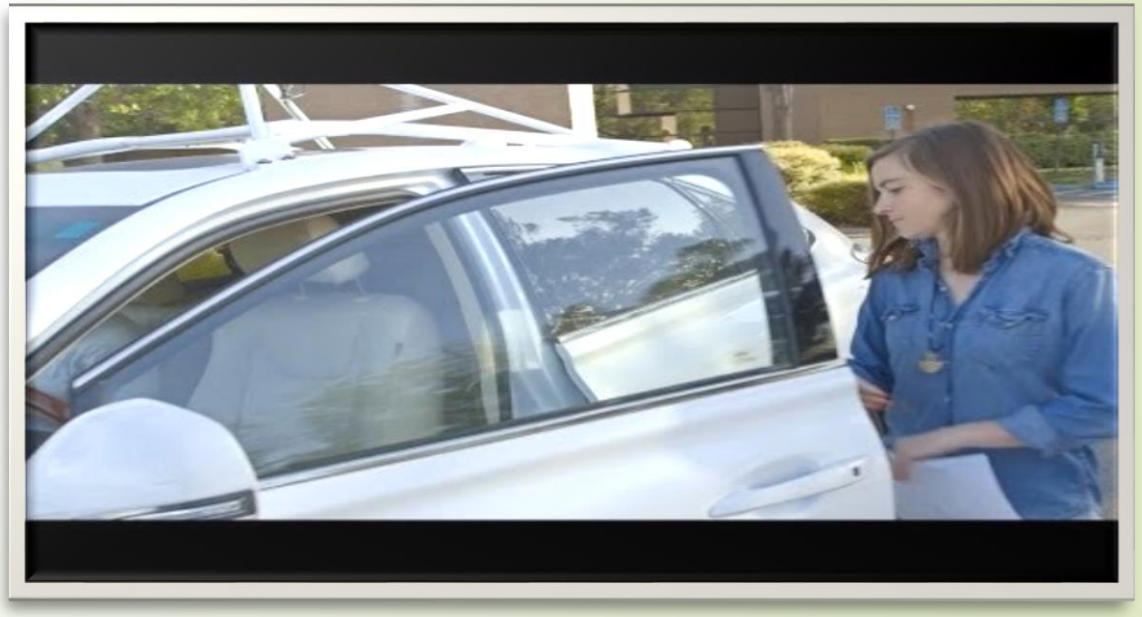
- The ethics of vehicle automation is a solvable problem.
- Other fields have handled comparable risks and benefits in a safe and reasonable way.



Example of automobile with an embodiment. [10]

Case Study (Ethics Into a Self-Driving Cars)

- 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.



A Ride in the Google self driving car [11]

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.

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Further Reading

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Thanks for your attention.

Questions .. ?