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Artificial Intelligence (AI)

- 1. What is AI, definition and use today?
- 2. Goal, vision, reality and consequences.
- 3. Ethical questions.



Definition of Artificial Intelligence

Hard AI:

- A computer can simulate, not only mimic human Intelligence ;
- this implies that the brain is nothing else than a very advanced computer ... that we do not (jet) fully understand.

Marvin Minsky, MIT



Definition of Artificial Intelligence

Soft AI:

- Methods and techniques to build smart computer systems solving practical problems.
- Do not need to be similar to human intelligence and their ways of thinking.
- Heuristics (experience, knowledge, rules of thumb, not always precise answers) methods and techniques.





Why is AI an important research topic?

- We learn more about our selves.
- Everyday devices and tools are getting more useful. They are starting to get "smart".
- Longing after sharing responsibility (?).
- Raising important philosophical and sociological questions (e.g. coexisting with AIs as intelligent as we or much more intelligent).



Artificiell Intelligens Standard programming:

The programmer translates knowledge needed to solve a specific task into code. This is a craftsmanship. The program is only able to solve the problems the programmer thought of.

AI programming:

- Separates knowledge and how knowledge is used. (Prolog programs may be run backwards).
- Possible to write programs modifying their own code (PROLOG, LISP, ...).
- The program is able to solve problems within some given framework, that the programmer did not anticipate in details.



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AI as an ethical and moral issue:

Al research and their visions have serious consequences on human well being (both positive and negative).

Media and in particular action- and SF- movies prefer to explore and exemplify unreal, partly real or real threats or disasters, often in a worst case scenario (Zeitgeist? action movies are perceived to be better if there is a big threat or disaster).

Which threats are real or unreal is sometimes difficult to see and may confuse the audience, but sometimes they are obvious (e.g. humans are used as batteries in Matrix).

Ethical issues are usually initially raised by researchers

Researchers have the knowledge to extrapolate and make best case/worse case scenarios from current research status.

Many of the original risks in movies are originally expressed by individual researchers and then exaggerated/distorted to make a "good" movie.

Hence movies are "distorted" channels of ethical and moral issues to a wider audience. Despite of this they are in some cases useful in discussions concerning the original ethical and moral issues (exaggerations/distortions used to make a "better" movie have to be removed/ignored to make the core issue clearly).







Vision: Emerging creativity and consciousness







Entities developing conciseness, creativity and with a desire to become humans (Pinocchio).

Movie: "Bicentennial man" 1999

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Also the creation of virtual realities (games) are quickly getting as real as reality. Human senses are easy to trick, sometimes it is difficult to know if an event was real or something we saw in a movie, read in a book or someone suggested us to believe they happened (false memories).

Vision: Ethical robots

•Three Rules of Robotics:

First Law: A robot may not injure a human or, through inaction, allow a human to come to harm.

Second Law: A robot must obey the orders of a human except where such orders would conflict with the First Law.

Third Law: A robot must protect its existence as long as such protection does not conflict with the First or Second Laws.



Asimov's Robot novels: *I, Robot, The Caves of Steel,* and *The Naked Sun.*

Not that easy ... Asimov points at some problems in his books, e.g. if their existence harms humanity?

Media gives us a dark vision. "Is this a reason for the declining interest in research and technology?"



"Intelligence without feelings or moral will become humanities end. "An intelligent psychopath would be very successful"

Vision: Self emerging Intelligence ?



- Internet is growing fast ... one day 100 billon reasonably powerful computers in a network.
- Is it possible that internet emerges intelligence and consciousness with the right sort of "virus"? (T3 team, smarter than humanity).

Reality today "artificial life" and "Genetic algorithms" research:

Evolving programs multiplying and breeding, best once survive, others die out. In research project they are multiplying and breading in hundreds of servers.



Vision: Cyborg, mixture of human and machine



- Extra functions: vision, memory, upload programs (Matrix)
- Visual cortex has a matrix implanted and a "real programmers" have a socket behind the ear (Neuromancer)
- Move the brain to a new "mechanical" body



have the right to switch it off?

Some US organizations fight this

 They claim that mixture between man and machine will be the end of humankin



will be the end of humankind, and must be forbidden in any form.

 What are the risks? Where is the limit? Extra sensory input (night vision for soldiers), implant of additional memory in students?





- 1. What is AI, definition and use today?
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- 3. Ethical questions (Peter and Gordana)



- Soft AI perceived as intelligent, mainstream today
- Hard AI computer can simulate and mimic human brain or other intelligence "not human based"

Ethical perspective: If humans are ethical, then a computer which simulates human intelligence may also be ethical, but if not?

Soft AI Questions With Ethical Relevance

- "Intelligent" programs with the ability to learn i.e. change their behavior according to circumstances, not under total control of a programmer, built in different products.
- Safety critical systems dependent on computers and programs. Airplanes, cars, industry machines, business and administrative systems.
- Technical equipment in human body.

Hard AI Questions With Ethical Relevance

- Responsibility for robots acts: human producing robots? Robots themselves?
- "Robots rights" and responsibilities? (Can only have sense in case robot can act as a responsible being, taking consequences of their deeds, and improving their behavior when necessary.)

Hard AI Questions With Ethical Relevance

- How to define consciousness? Can (human-like) consciousness arise as a side-effect of (program) complexity? Can artifact be considered as conscious? How to treat conscious artifacts? What happens if robots get intelligence superior to human? Robots outperforming humans?
- Research within AI can help us learn more about ourselves and human ways of thinking (also in terms of ethics).

Hard AI Questions With Ethical Relevance

- Robots with feelings?
- Robot soldiers?
- Switching off a robot as a murder?
- Cyborg vision a combination of human and machine
- Moving the brain to other, mechanical (?) body

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