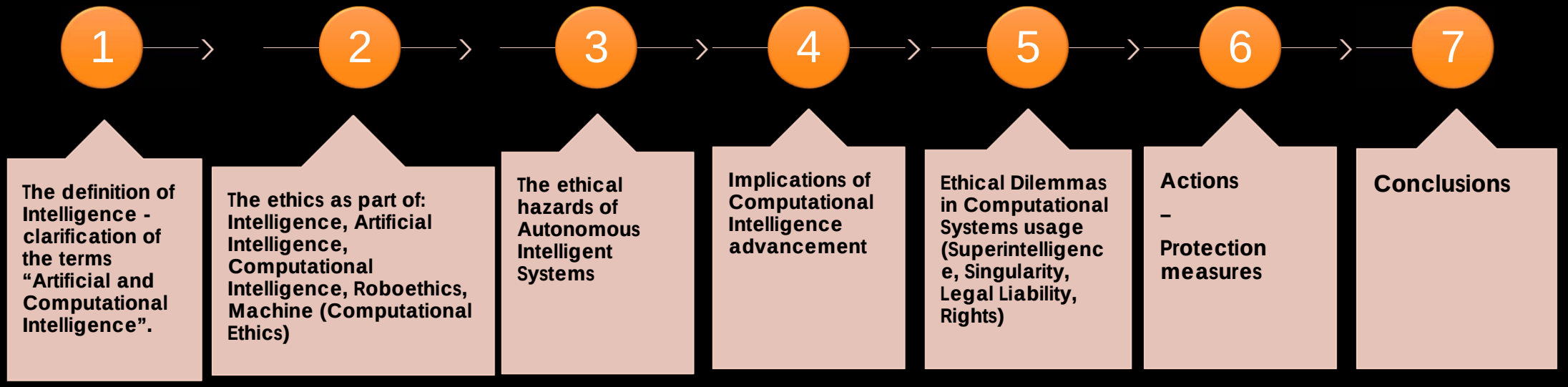
ETHICS AND COMPUTATIONAL INTELLIGENCE

Fyntrilaki Anna[1], Papadourakis Giorgos[1], Tsirigotis Georgios[2]

[1]Hellenic Mediterranean University, Heraklion, Crete, Greece

[2]International Hellenic University, Thessaloniki, Greece

PRESENTATION STRUCTURE



INTELLIGENCE:

- Binet, Theodore Simon (1905): Is the faculty of adapting one's self to circumstances

  -good sense (judgment) -the rest of intellectual faculties are not important

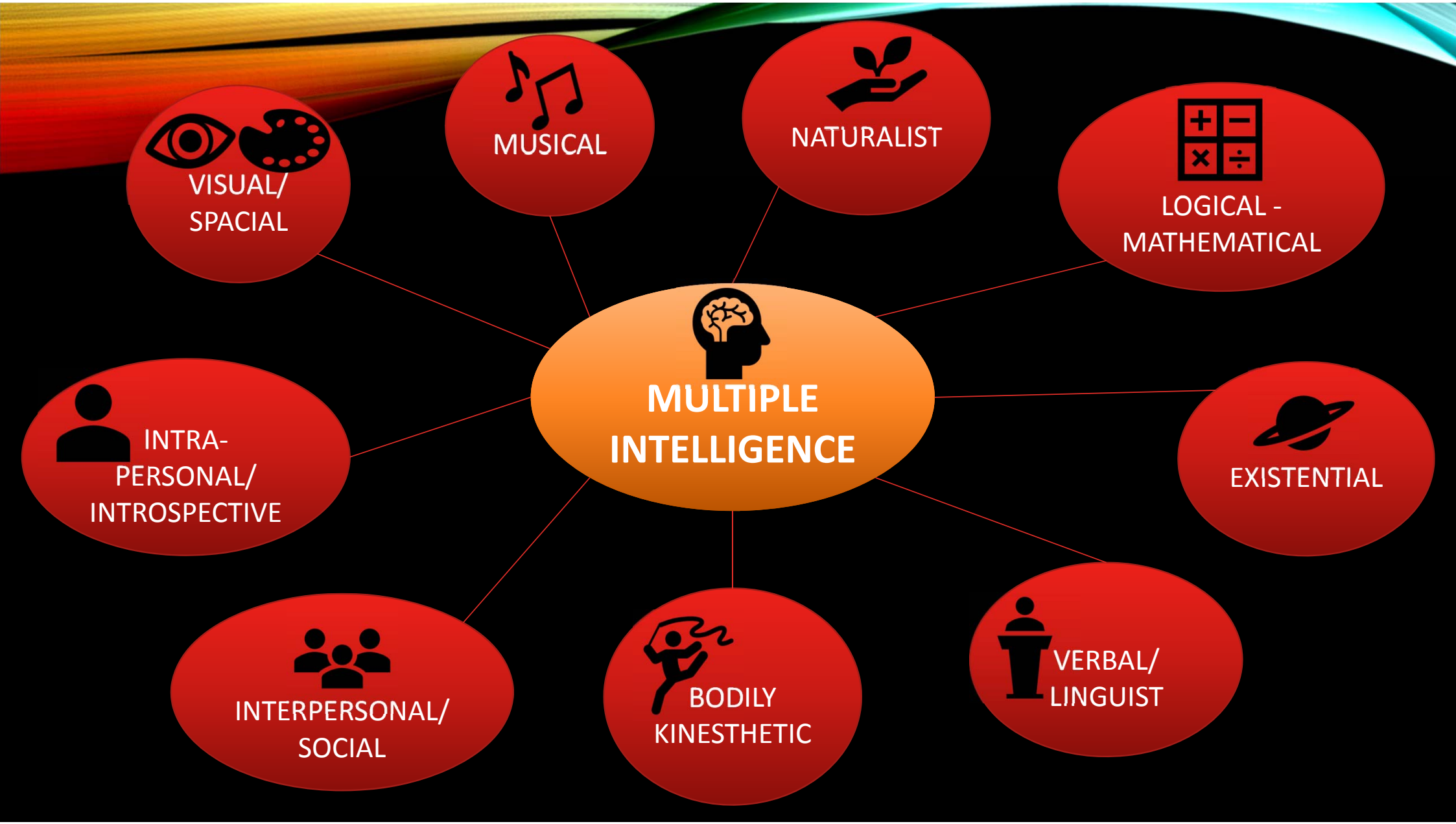
- David Wechsler (1944): Is the aggregate capacity of the individual to:

  - act purposefully - think rationally - deal effectively with his environment

- Sir Francis Galton (1860): He believed that many human attributes, including criminality and intelligence, are inherited.

- Howard Gardner (1983): Our intelligence is much more than what is measured via IQ tests – multiple intelligence.

- Scientists claim that it is also influenced by:
  -the age -the experience -the mental abilities -extrinsic factors


MULTIPLE INTELLIGENCE
VISUAL/ SPACIAL
MUSICAL
NATURALIST
LOGICAL - MATHEMATICAL
INTRA- PERSONAL/ INTROSPECTIVE
EXISTENTIAL
INTERPERSONAL/ SOCIAL
BODILY KINESTHETIC
VERBAL/ LINGUIST

ARTIFICIAL INTELLIGENCE – AI :

- Artificial intelligence was founded as an academic discipline in 1956

- Colloquially, the term "artificial intelligence" is often used to describe machines (or computers) that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving". (Russell & Norvig 2009)

- It is the field of Computer Science which deals with

  -the design of intelligent computer systems (Barr and Feigenbaum).

  -the design and implementation of programs that are capable of mimicking human cognitive abilities.

COMPUTATIONAL INTELLIGENCE - CI

- The term was first used by Professor J. Bezdek (1992)
- It was originally defined as the set of three technologies involving neural networks, fuzzy logic, and evolutionary computation.
- Later it was defined as a set of algorithms based on physical process

- In general, computational intelligence is a multidimensional field inspired by nature with computational methodologies and approaches to tackle complex real-world issues.
- It is a way of imitating the cognitive abilities of human beings without possessing general intelligence.
- Algorithms, based on numerical processing of information, are used. These algorithms analyze and learn from existing data

COMPUTATIONAL INTELLIGENCE- ARTIFICIAL INTELLIGENCE

- ✓According to Bezdek (1994), Computational Intelligence is a subset of Artificial Intelligence.
- ✓Computational intelligence is based on soft computing methods.
- ✓It does not use knowledge as accurately and comprehensively as artificial intelligence.

- ✓Artificial intelligence is based on hard computing methods.
- ✓Artificial Intelligence uses sophisticated electronic systems to implement its models

Common goal: To approach the general intelligence (the ability to perform any spiritual human process)

MORAL INTELLIGENCE:

- **Moral intelligence is the ability to distinguish good from evil and respect the values of other human beings**

Virtues of ethics according to Dr Michele Borba:

- Empathy (the ability to recognize the feelings of other human beings)
- Consciousness (the ability to recognize the right)
- Self-control (the ability to control our thoughts)
- Respect (the ability to show how you value other human beings)
- Kindness (the ability to care for the well-being and the feelings of other human beings)
- Tolerance (the ability to respect the values and rights of all people)
- Justice (the ability to treat others fairly)

Ethics of Artificial Intelligence

- It is part of the ethics of technology, which concerns robots and other artificially intelligent beings.
- Since today's AI systems are not ethical, it is not clear what exactly is considered ethical about them.

Machine ethics

- The German Ministry of Transport and Digital Infrastructure (BMVI) has accepted that "ethical human behavior cannot be modeled".
- "Machine ethics" deals with the behavior of robots, whether they have rights or not.

Roboethics

- It deals with the issue of how humans design, construct, use and behave towards robots and other beings with artificial intelligence.
- It also deals with the ethical systems embedded in robots, the ethics of people designing and using robots and the ethics of how humans treat robots (Peter Asaro).

Computer ethics - CE

- It is the set of ethical principles that govern the use of computers
- It can be defined as the systematic study of the ethical problems arising from the entry of information technology into society
- It is an analysis of the nature and social influence of information technology, and the formation of its rules, towards the ethical use of information technology (James Moor, 1965)
- Information ethics (IE) claims that there is something more fundamental than life and pain, this means that existence is understood as information, and any information entity is worthy of recognition

Morality

SENSITIVITY:
It is defined as the ability we gain from experience, such as the feeling of pain

WISDOM:
It is defined as a set of abilities related to higher intelligence, such as self-knowledge

The Principle of the Ontogeny of Discrimination claims that the way a creature is created has nothing to do with its moral existence. It does not deny, however, that the creator has obligations and duties in relation to this specific creature.

MORAL RISKS OF INTELLIGENT SYSTEMS

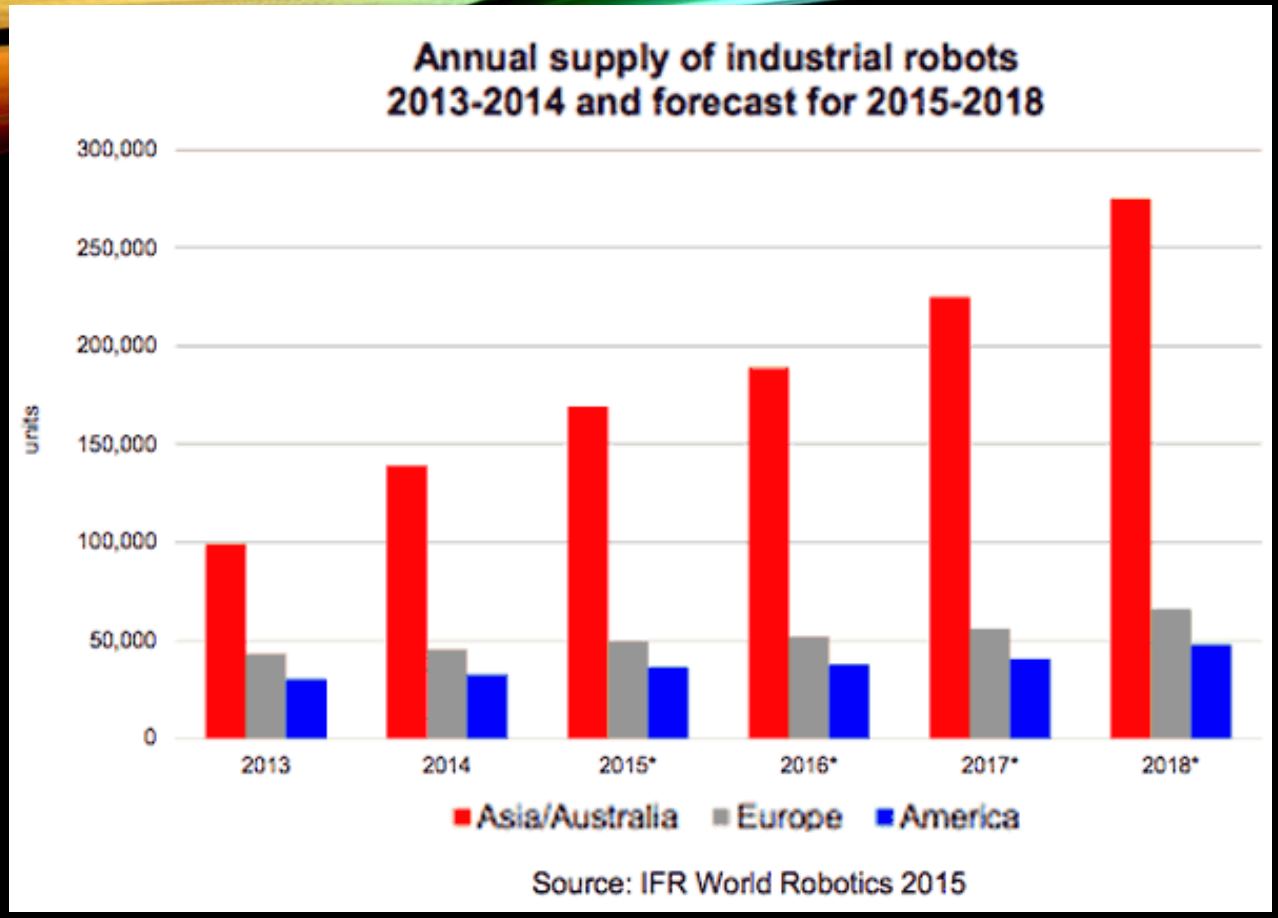
- Intelligence Technology has reached a point where the development of autonomous weapons is possible within years, not decades, and this is a serious issue
- This is the third revolution related to the field of war, after gunpowder and nuclear weapons.
- Artificial Intelligence can be used to make the battlefield safe for military persons
- However, offensive weapons that operate on their own, would result in greater casualties

- Educational technology is the study and ethical practice of how to facilitate learning processes and improve performance through the creation, use and management of appropriate technology processes and tools
- Behavior change, aggression, addiction, cyber bulling (Cleverbot-NAO AI application)

- self-driving cars, automated unmanned aircraft (for military purpose), human-care robots, or even robots used as servants.

PROFESSIONAL CONSEQUENCES :

- The National Bank of England forecasts 15 million jobs to be cut
- In agriculture there are several applications of artificial intelligence, such as robots that remove non-arable plants, automation of dairy production, tractors programmed for certain tasks before they enter the field, automatic harvesting of vegetables and fruits and much more
- In the banking sector, there is automated software that instantly responds to customers for banking products.
- In publications, there are already novels written by using artificial intelligence techniques in Japan.
- In Japan there are 1.520 robots per 10,000 workers in car factories.
- Worldwide average figure: 66 robots per 10,000,
- China is the world's largest robot buyer, accounting for 25% of global demand.



INDUSTRIAL REVOLUTION:

The revolution of AI will not be a confrontation between the physical capabilities of humans and machines, but a confrontation between the human mind and mechanical thinking and power.

THEOLOGICAL IMPLICATIONS :

- *TRANSHUMANISM: supports and promotes the use of technology and science to improve the physical as well as the spiritual characteristics of the human race.*
- *METAHUMANISM: It promotes the creation of an Immortal Entity -> Transferring Consciousness to a Robot (a kind of theology)*
- *As part of an experiment the creation of "BLESS-U2" (priest-robot) by clergyman Stephan Cramps, has already taken place*

IMPACT ON THE RELATIONSHIP BETWEEN THE TWO SEXES:

- Creator Sergi Santos, who is responsible for designing one of the first sex bots known as Samantha, hopes that one day humans and their tech will be having children.

- True Company is developing at the moment "ROXXXY" (the first sex-robot). The company claims that it is not designed to replace a spouse but to fill a gap that some people may experience.

- Several questions arouse here;
  Can a robot with artificial intelligence and elements of consciousness be whipped?
  Will sex with a robot dog remain illegal?

MEDICAL USE OF ROBOTS:

- Philip Dick, the humanoid robot created to train surgeons in interpreting patients' facial expressions.
- Bionic hand that has the ability to see and move itself to the correct direction
- Motorized sperm robots help in birth control.
- Machine Learning: It will recognize vision problems with just one scan

MILITARY USE:

Many computer systems have been developed in order to ensure the dominance of a specific country in a potential future war.

- «Alpha» (aircraft's artificial intelligence), the most aggressive, dynamic, reliable and the fastest decision-making form of artificial intelligence.
- «USV-UNMANNED SURFACE VESSEL», a 12-meter unmanned craft, intended to conduct mine and anti-submarine warfare missions.
- «SEA HUNTER», a 40-meter unmanned vessel which travels without a remote control for 2-3 months (it is used as a submarine hunter)

Superintelligence

- an intellect that is much smarter than the best human brains in practically every field, including scientific creativity, general wisdom and social skills (Nick Bostrom).
- Such machines without the limitations of the biological brain will be developed in the foreseeable future and this may lead to the disappearance of human race (eg happiness endorphins, optimization of ligament production).

Technological singularity

- It is the process by which artificial intelligence will be developed rapidly and take the lead from its creators.
- A kind of technological acceleration that produces unexpected results within society (John von Neumann)
- A change that can happen unexpectedly and it is not clear whether such an explosion of intelligence will be an existential threat or whether it will be beneficial for humanity

REASONABLE THINKING AND EMOTION – CORRECT DECISION

- Are emotions against the rational thinking?
- What is apparently called a reasonable mental process is complemented by some form of emotional process (eg accident of Finea Gates).
- Logic cannot work properly if it is completely separated by feelings and emotions.

After all machines are not superior to human beings in decision making, probably because they still lack the capacity for emotional functions, despite the lack of "emotional distortions" (Mavridis Nikolaos)

MORAL QUESTIONS

Is a robot able to understand the impact of its actions?

Is there absolutely good and absolutely evil? Who can define it?

Are emotions merely a human characteristic?

Would anyone trust a "machine" to make a sensible decision?

Should humanity treat machines as a superior species or as a mere tool? (Eg ATLAS - the most advanced humanoid robot)

If a robot can think like a human being and make decisions, who can guarantee for its right choices?

- -Sophia - the robot with citizenship from Saudi Arabia. It has artificial intelligence software that answers questions, gets anthropomorphic facial expressions, humorizes and asks the questions in return.

- "Random Darknet Shopper", the automated robot created to investigate the dark side of the internet. The robot was jailed because of illicit purchases.
- So who is responsible for the criminal activity of a robot?
- Can a robot get into prison if it commits a crime?

Ethical issues in medical use

High-tech intervention in the human body can lead to:

- Proliferation of human intelligence and emotions.
- Increasing emotional well-being.
- cerebral clarity.
- Increase life expectancy by 20 years.

Would parents be happy to trust their childcare in a robot?

ETHICAL ISSUES IN MILITARY USE

- Can machines be allowed to kill? Under what conditions?
- Can autonomous weapon systems comply with human law?;
- Would lethal machines decisions violate basic ethical principles?
- Exoskeletal robots (exoskeletons) allow soldiers to increase their physical abilities without losing any biological parts of their bodies.
- There is already talk about human-machine coupling
- The goal is to create efficient and harmonious groups of people and machines with their intelligence distributed through networks

Human rights granted to robots

- Apart from technological prerequisites, there are two more needed for transferring the human mind to computers:
  - equal, or similar, rights for robots and humans.
  - The belief that there are no souls.

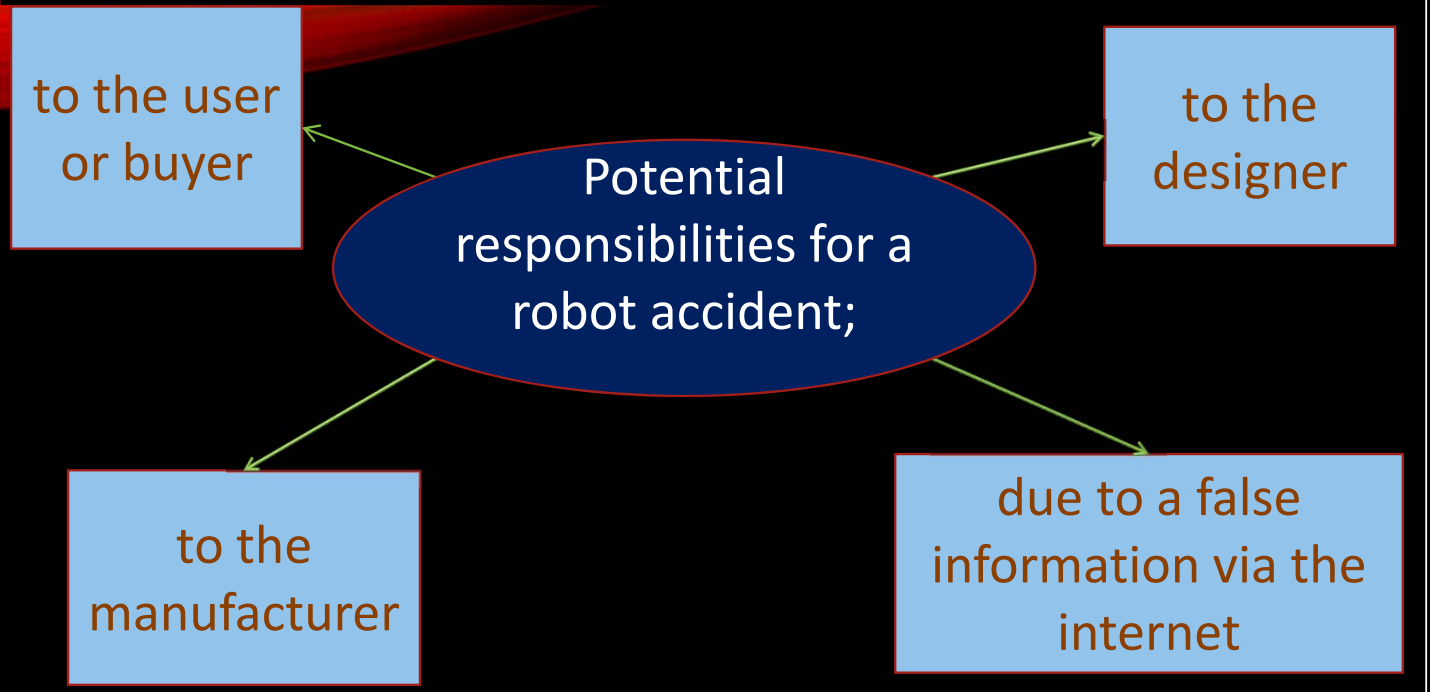
- Once robots become fathers-in-law, lovers, friends, and colleagues, the backups of the robot will be treated as its "soul". Then will be created a legislation that is going to treat the murder of a human being and erasing the memory of a robot as equal acts.

- All technologically advanced societies need to consider what is ethical about intelligent systems and what is not. They should adapt the laws of the society on this basis.

- If the right to make copies of themselves is given to those beings who are capable of reproducing themselves indefinitely, the system of government will be overwhelmed.

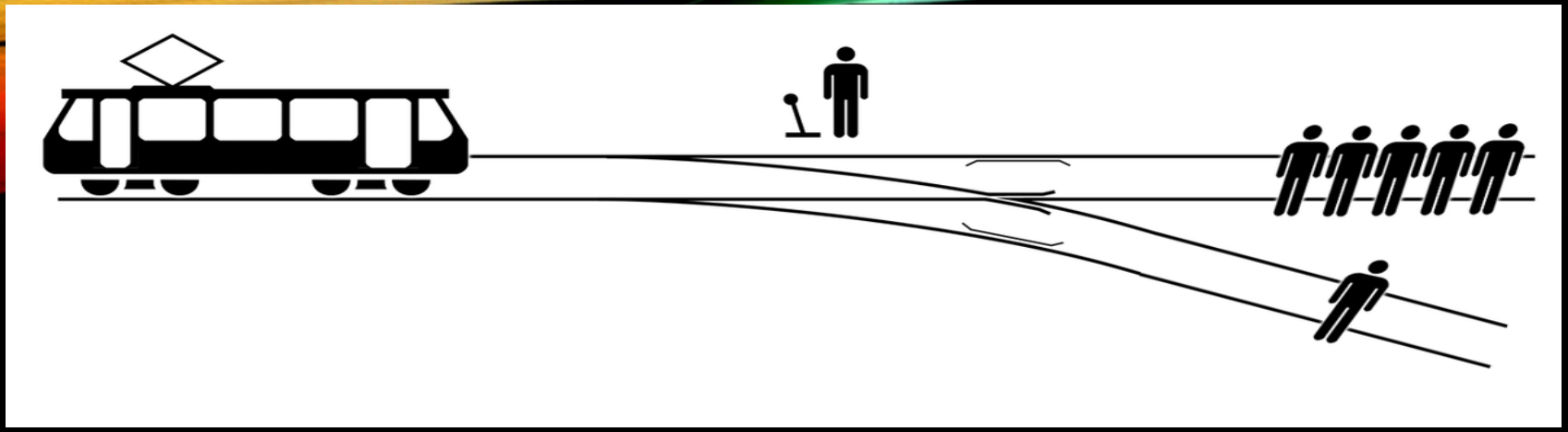
- Robots could one day claim the rights of a citizen, like humans. So what happens if the robots have the same rights as us?

Legal Liability



- There is no legal frame for liability.
- The greater the autonomy of robots, the less they can be regarded as mere tools in the hands of other entities (such as the manufacturer, the owner, the user, etc.)

- The punishment for the "murder" of a robot is likely to be slightly related to the punishment for the murder of a human being in the future.
- Granting “e-personality” to a robot in order to protect society from Artificial Intelligence developments
- Could a society deny to a sophisticated robot the right to participate in social decision-making processes, such as voting?



The trolley problem:

You are standing next to a lever that controls a switch. If you pull the lever, the trolley will be redirected onto a sidetrack, and the five people on the main track will be saved. However, there is a single person lying on the sidetrack. You have two options:

- Do nothing and allow the trolley to kill the five people on the main track.
- Pull the lever, diverting the trolley onto the sidetrack where it will kill one person.
- Which is the more ethical option? Or, more simply: What is the right thing to do?

LEGISLATION RELATED TO THE CO-EXISTENCE OF HUMAN BEINGS AND ROBOTS

Reworded Asimov's three robotic laws as (David Woods and Robin Murphy (2010) :

- A human being cannot use a robot unless the human-robot work system reaches the highest legal and professional levels of security and ethics.
- A robot must respond in the most appropriate way to human beings.
- A robot must be able to protect its existence, as long as this self-protection does not conflict with the first and second law.

Some of the Ten Rules of Computer Ethics (1992), from the Computer Ethics Institute (CEI):

- ❖You must not use a computer to harm other people.
- ❖You must not use the computer to interfere with the work of others.
- ❖You must not use a computer to steal information.
- ❖You must always use a computer in ways that ensure that your peers are appreciated and respected.

CREATING ETHICAL REGULATORY RULES BETWEEN HUMANS AND COMPUTING SYSTEMS

JURI Committee Resolution on:

- ❑ people's security, privacy, integrity, dignity and autonomy.
- ❑ it is necessary to establish criteria for "personal intellectual work", for projects created by a computer or a robot that can be protected by copyright.
- ❑ monitoring the evolution of employment to avoid negative effects on the labor market.

United Nations:

- ❑ published a report on the slowdown in the development of "deadly autonomous robots".

US Bill:

- ❑ To be accelerated the control of automated systems and unified the required security standards that have addressed various issues at the state level.

FURTHER RESEARCH PROPOSALS - European Parliament Committee

It could be considered to set up a European Agency for Robotics and Artificial Intelligence providing the necessary know-how and expertise in regulatory and ethical issues to support the relevant public bodies.

States Members could develop more flexible training and education systems, so that skills strategies can meet the needs of a growing robotic economy.

The human-robot joint action must be governed by two basic interdependent processes; predictability, guidance.

A compulsory insurance system must be created, where the appropriate and necessary issues for specific categories of robots will be defined- similar to the existing car insurance system.

A Common European Principles frame must be established before each Member State adopts its own different rules

CONCLUSIONS

- A number of rules are needed, in particular on responsibility and ethics, which reflect the intrinsic European and humanitarian values.
- Laws must be adopted that define the ethics of computational intelligence.
- People need to be part of this development so AI can help reinforce human ingenuity and create a culture based on collaboration.
- We should overcome the mentality that “we do something, just because we are able to do so”.

- We are approaching a time when machines will be capable of doing better than humans at almost any task. My personal belief is that society has to face the following question; If machines will be capable of doing almost any task people can do at the moment, what will people do in the future?
- Is there such a thing as the transfer of our consciousness to a computer?
- Can they follow the ethical principles of our society?

It is necessary to create ethical regulatory rules, which will define the relationship between people and computer systems and set standards for security regulations.