

# Innlevering 1 – AI

## 1.1 Concepts, definition and history of AI and interaction with AI

**First, write a section about how AI came about, the history of AI. When, and by whom, was the term first used?**

The history of how AI came about begins during World War II, where the potential importance of computers was established through its role in code breaking. A leading code breaker at the time, Alan Turing, wrote in the London Times that “I do not see why [the computer] should not enter any one of the fields normally covered by human intellect, and eventually compete on equal terms” (Grudin, 2009). The term “artificial intelligence” (AI) was first used in 1956, in a call for participation in a workshop, written by John McCarthy. AI evolved over the decades, and eventually took a turn described by McCarthy who wrote that “[the goal] was to get away from studying human behavior and consider the computer as a tool for solving certain classes of problems. Thus AI was created as a branch of computer science and not as a branch of psychology.” The most recent turning point in the interest of AI came in the year of 1997, where a machine defeated the world chess champion. Further on, events such as launching remotely controlled robots on Mars, the availability of the internet and recommendation systems within it, as well as reduced costs for storage, processing and access, lead to the big interest we have of AI in today's society.

**Then, find three different definitions of AI. Describe and explain these three definitions, for example by when it was defined, by whom and in what community. Based on these three definitions, make one definition yourself - and describe and explain your definition.**

*Definition 1: “AI is a subfield of computer science aimed at specifying and making computer systems that mimic human intelligence or express rational behaviour, in the*

*sense that the task would require intelligence if executed by a human.” (Verne & Bratteteig, 2018)*

*Definition 2: “Artificial Intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.” (Investopedia, 2020)*

*Definition 3: “The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.” (Britannica)*

The definition by Bratteteig and Verne talks about AI as a field of computer science, while Investopedia defines AI as a simulation, and lastly Britannica writes both about the theory and the development of the systems. These three definitions do not contradict each other, but they focus on three different aspects of what AI is about. The definitions also vary in age, as Bratteteig and Verne’s paper is written in 2018, the Britannica definition is from 1998 or earlier (it is difficult to pinpoint when it was actually written as it existed in book form previously, but it was uploaded online in that year), and the Investopedia definition unfortunately has no written date.

My definition of AI would be:

*“AI is a machine performing tasks that requires human intelligence, as well as being able to mimic human cognitive processes”.* This definition is inspired by the other definitions above, but more focused on the aspects I find important with AI. To me, AI is not a theory or a field, but the actual system performing the tasks and how that system is perceived.

**Find one contemporary company that works with AI and describe how this company presents AI on their web pages. In what way does this company talk about AI, as a product, as a service, framework or “idea”?**

The company Computas is a Norwegian provider of IT solutions and consulting services in technological innovation. They talk about AI as a theory and a development process, writing on their website that “Artificial intelligence is the theory and development of

computer systems capable of performing tasks that require human intelligence” (Computas), very similar to Britannica's definition. They also explain it as taking what is seen as human characteristics, and transferring them to a machine.

**Select one documentary or a fictional film, book or game that is about the use and interaction with AI. Describe with your own word how human interaction with AI is portrayed in this work.**

The movie *Her* (2013) is a fictional movie about a man who falls in love with an AI. The plot shows a recently divorced man who feels lonely and misses his ex-wife, but finds company in a new operating system called Samantha. She exists on his computer and his phone, and they have very human-like conversations, which creates the feeling of her being an actual person. In this movie, AI is portrayed as a system that can be perceived as a real human, and a system that can evolve and think on its own. This is shown in the end of the movie, where the system (Samantha) decides on her own to explore outside the operative system, and leaves.

## 1.2 Robots and AI

**Write a section about how the word Robot came about.**

The term “Robot” was first used in 1920, by Karel Čapek in his play *R.U.R* (Rossum's Universal Robots), although he names his brother as the original inventor of the term. However, the word ‘robot’ was not new, as it had been in the Slavic language for a long time, having the word *robota* with the meaning “forced laborer”. In the play, Čapek told a story about artificial human bodies without souls doing the work that humans did not want to do, and the word *robot* then fit with the explanation of these artificial workers.

**Find two different definitions of “robot”. Describe and explain these definitions. Based on these definitions, make one definition yourself, and describe and explain this definition.**

*Definition 1: The Robot institute of America defines robot as “A reprogrammable, multifunctional manipulator designed to move materials, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks” (Thrun, 2004).*

*Definition 2: “A machine that resembles a living creature in being capable of moving independently (as by walking or rolling on wheels) and performing complex actions (such as grasping and moving objects)” (Merriam Webster Dictionary)*

The two definitions are different from each other, in the way that the first definition only talks about it being a manipulator and its functionality, while the second definition mentions the machine's resemblance to a living creature as well.

My definition of a robot would be:

*“A machine made by humans with the purpose of doing complex tasks”* Whether the machine resembles a living creature or not, is not essential to me when defining a robot. The important part is that the machine is able to do complex tasks, with a purpose set by the designer of the machine.

**Discuss the relation between AI and Robots. Is “a robot” different from “an AI”? In what ways are they different and similar? Bring in the definitions that you described earlier about robots and AI for this discussion.**

When talking about a robot, one generally only talks about the tasks that the machine is able to do, while the AI adds the element of human intelligence. A robot is only defined as “a manipulator designed to move materials”, it is more of a physical tool in a way. A definition of an AI often includes “mimicking human intelligence” (Verne & Bratteteig) and cognitive skills like “visual perception and speech recognition” (Britannica), which can make an AI more of a collaborative partner than a simple tool, like a robot is.

**Find one contemporary physical robot, either described in a research article - or a commercial robot, and describe how this robot moves and how a human user is interacting and using the robot in a specific situation.**

A commercial robot that I have experience with, is the robot vacuum cleaner. This is a simple robot, programmed to analyze a room and then clean it by driving back and forth until it has covered the entire space. Usually, the human does not have to interact with it much for it to function. Either, the human user has to program it once with time intervals, and then it will do the job on its own periodically, or the human user has to go turn it on manually every time they want the floors cleaned. These robot vacuums have a “home station” that they return to when finished cleaning the floors, which also acts as a charging station.

## 1.3 Universal Design and AI systems

**Please find and describe a definition of Universal Design. Explain this definition, how you understand what Universal Design is about with respect to inclusion.**

*“Universal Design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.” (Universaldesign.ie)*

This definition talks about access, understanding and usability, by all people. These three words are essential when talking about universal design, because when something is universal, that means it is for everyone, regardless of their abilities or disabilities. If something is designed to leave any one user group out, then it is not universally designed.

**Describe the potential of AI with respect to human perception, human movement and human cognition/emotions. You are encouraged to use examples.**

AI can be used to aid companies in customer service, by being used in chatbots, where they are to be perceived as humans in customer service, able to help customers with simple tasks and questions. AI also has the potential to help aid people with movement, like having self driving cars for people who struggle with driving themselves.

**Describe the potential of AI for including and excluding people. You are encouraged to use examples.**

AI has the potential to help include everyone, as they can help people with difficulties within perception, movement and cognition. For example voice controlled AI (like Siri) are used a lot as a tool for visually impaired people, to help navigate as well as perceive information. Voice controlled AI can also end up excluding people, for example people who have trouble speaking or have a speech impediment.

**In WCAG 2.1 principles and in the Human AI-Interaction guidelines the concept “understand” and “understanding” is used. Explain briefly in what way you make sense of the concept “understand” and “understanding”. Then address the question: Do machines understand?**

To me, the concept of “understanding” something means that you perceive the *meaning* of what is said or done. I see this as a human skill, and not something machines can do to the same extent. When a machine “understands” a command, it only reads it and its following

actions are then programmed, it does not have its own personal understanding of the word or the action that has taken place. I think that a machine can be perceived to understand something, but not truly understand it as it only “understands” what it is told that something means.

## 1.4 Guideline for Human-AI interaction

**Please select one of the 18 guidelines from Microsoft, and describe this guideline with a different example than what is given by Microsoft.**

*G13: Learn from user behavior.*

AI should learn whether a user is experienced or inexperienced, and then respond thereafter so as to aid the user in the best possible way, whether that be explain more in detail or skip explanations all together.

**Search, and find one set of HCI design guidelines. Discuss briefly similarities and differences between the HCI design guidelines and the Human-AI interaction guidelines.**

I have chosen Donald Norman’s seven principles of interaction between human and computers. There are a lot of similarities between the two sets of guidelines, as they both write about the importance of the user understanding. Donald Norman’s guideline “*Make things visible*” and the Human-AI interaction guideline “*make clear what the system can do*” are both about showing the user what the system’s abilities are. When it comes to differences, Donald Norman’s principles are more specifically about understanding, whereas the Human-AI interaction guidelines also cover social elements and efficiency.

## References

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