

## Individual assignment – Iteration 1

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

#### Origin of AI

According to Grudin, AI was already developed during the second world war by Alan Turing through his codebreaking machine. His contributions and thoughts on the subject are seen as a main contributor towards the growing interest in the AI-field. Furthermore, the term “Artificial intelligence” or “AI” was first used in a workshop by John McCarthy in 1956 (Grudin, 2009).

#### Definitions of “AI”

McCarthy is often called the “father of AI”, and according to his webpage his updated definition of AI is: *“It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable”* (McCarthy, 1998). Here, in 1998, McCarthy explain that AI not only is about developing intelligent programs, but that it also is related to understanding human intelligence. However, the two definitions following build their definition around AI about making systems that mimic human intelligence.

The definition by Merriam Webster as of 2021 *“an area of computer science that deals with giving machines the ability to seem like they have human intelligence.”* (Merriam Webster, 2021) is an example of a short definition that focuses on the fact that AI-systems is developed with the purpose of recreating human intelligence and/or behavior.

The third definition by Tone Bratteteig and Guri Verne goes like this: *“AI is a subfield of computer science aimed at specifying and making computer systems that mimic human intelligence or express rational behavior, in the sense that the task would require intelligence if executed by a human.”* (Bratteteig & Verne, p.1). An interesting part of this definition is the inclusion of the intelligence required to execute a task as if the AI-system was a human, which specifies the need of mimicking human, rational behavior.

When making my own definition of AI I wanted to combine the three mentioned definitions. Based by those definitions, I would define AI *as a field of computer science that focus on developing and engineering systems that is able to mimic human intelligence and behavior in for instance problem-solving or task-execution.*

**Review of “Does AI make PD obsolete?” by Tone Bratteteig and Guri Verne**

The article “Does AI make PD obsolete” is about how AI challenge PD and the role of PD in a future of AI research. Bratteteig and Verne voiced their concerns that the “goal” with AI – to customize services after their users and to make their life easier - is something that possibly could make PD unnecessary, since PD in many ways has the same purpose. A remark originally made by Holmquist is that since PD follows and includes the user throughout the design process, they likely end up with a finished product already custom made for them. In contrast, AI is always evolving by the data they collect during the use of the AI-system, and this means that a large part of the training falls on the user after purchase. This also make the design and development of the AI hard to predict by the designers, as it is difficult to properly understand how the system works. In their concluding remarks the authors pressure that even though AI indeed challenge PD, the methods used in PD could be useful in the design process of future AI-systems.

**Grammarly’s as a contemporary company and their view on AI as a service**

The company Grammarly both works with and sells a service involving AI-systems. Grammarly provide their users with what they describe as an “AI-powered writing assistant” (Grammarly, 2021). They further present their services to as a way to help you (the user) express yourself better with the help of their AI-systems, both through spellchecking and by suggesting other wordings and synonyms depending on who the receiver of the writing is. A point they also make it that their service provides more than just regular spellchecking because of their use of AI-systems, and that their service is meant to be seamless so that your life is made considerable easier after installing the service.

**AI presented in “The social dilemma”**

The Netflix documentary “The social dilemma” mention how AI is being used to gain and build fitted content based on which social media(SM) posts you watch, like or share. One of their main focuses is that we, the users, are the dataset and our continuous input through interaction with the app is in a sense the training set for the AI. They make AI out to be a tool to keep users exploring and using the SM app – and in some ways brainwashes the users by providing a continuous flow of information – or one-sided information based on what we earlier have taken an interest in, rather than giving us a more elaborate picture of the situation. An example is that if you search for or like a picture of a knitted sweater on Instagram, you soon have your whole explore-feed filled with new pictures of knitwear.

Furthermore, the people in the documentary is called whistleblowers, which sets a rather dark tone, and makes it seem a bit like a warning about what SM has become and they fear it will be in the future.

## 1.2 Robots and AI systems

### Origin of robots

The term “Robot” was first used by Karel Capek in his play R.U.R in 1920, and the word has its origin from the Czech word “robota”, which is translated to “forced labor”. The reason behind the choice of the term is because the robots(manufactured humans) in the play were cruelly exploited by their creators which their name was meant to represent (Britannica, 2005).

### Definitions of “robot”

The article about HRI by Sebastian Thrun presents two different definitions of “robot”. The first definition was made by the Robot Institute of America in 1979, and describes robots 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, p.11). In my opinion this definition mostly describes industrial robotics, but given the time in which the definition was given this view on robots fit the scope that robots were used. They focus mainly on the tasks the “manipulator” are able to do and that they are able to manipulate their surroundings through these tasks.

As the second definition was based on the Merriam Webster dictionary, I updated the definition from the 1993 version to the 2021 version, and it says: “*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)*”. This definition covers the form of the robot and describes their abilities more humane than the first definition. Instead of focusing on the tasks they rather focus on the autonomy of the machine.

Again, by making my own definition I used the two definitions above as a starting point. I would define robot as *a machine designed to manipulate its surroundings by different levels of autonomy, and to perform various complex tasks or actions without the help of humans*. I found it important to both include the purpose of robots and their abilities, and I wanted to include the term autonomy especially since this is an important factor to distinguish between different kinds of robots.

### **The relation between AI and Robots**

I think that one part of the relation between AI and robots is that robots in many cases is based on, or is a product of AI. As AI is based on human intelligence and how we execute tasks, it unites with the perspective that robots also has the ability to execute tasks like humans. A distinction between the two is that AI does not need to have a physical form, like in the definition by McCarthy, AI is not limited to what can be “biologically observable” by humans. I feel like robots are more limited by a physical form, which both definitions above imply since they specified robots as “manipulators” and “machines” rather than systems or programs.

To me the line between AI and robots isn't all that clear, and I feel like the line between them shifts from which definitions of AI-systems and robots you look at. For one I think that the relation between them is strong because I don't think that a system or machine is either based on AI or is a robot, but could be a mixture of both - like chatbots.

### **How a robot moves – Robot lawn mowers**

The robot lawn mower navigates its route by both GPS-tracking and sensors while mowing. Guri Verne describes her relation to her robot lawn mower by the mutual interaction to better the robots performance in mowing the lawn. A robot lawn mower needs a lined up field of work that the users need to line up for them. Most of the interaction with the robot after the initial setup is to clear out possible hindrances, like garden tools or toys that has been left in the grass (Verne, 2020). As the robot don't have the ability to remove obstacles, this work is left to the owner. With no obstacles to clear, the interaction is mostly non-existent as the robot is able to charge itself and tracks its own route based on the restrictions mentioned earlier.

## **1.3 Universal design and AI systems**

### **Definition of universal design**

When looking for a definition on universal design I went to the pages of UUtilsynet, and here is their definition (in norwegian). “*Universell utforming bygger på tanken om at tenester skal vere tilgjengelege for alle, uavhengig av alder, funksjonsevne og utdanningsnivå.*” (utilsynet, 2021). This definition has a clear focus that all digital or non-digital services should be available to everyone in the way it is designed. What I think it presents is the thought that instead of including people with disabilities as an afterthought, they should be involved from the beginning of the design-process. Inclusive design is meant to “include” all potential users of a product or a service in a sense that they don't feel forgotten about or left out.

Also, this isn't only about those who have permanent disabilities, but also those in a certain contexts aren't able to use the services. To test and evaluate services in different contexts and with users of different demography and background is very important to ensure that more people are able to participate or use the services that is being developed. This consideration will not only locate possible lack of inclusion of certain people, but also how to better the experiences for all future users.

### **Potential of AI-systems**

I think that AI-systems have the potential to enhance the understanding of both human and possible artificial intelligence. To know how to make AI-systems mimic human behavior you also have to better understand human behavior and psychology. For instance, one could possibly develop AI-systems to better understand and include people with disabilities, which also will entail a better understanding of how they behave and use technology.

Furthermore, I think that AI-systems have the potential to both include and exclude people, like any other services or products have – and one thing I find particularly interesting is the way that AI-systems could help us better provide inclusive services. Subtitles to voice-based content is meant to make the content available to more people. A way that AI-systems could better this service is to create subtitles to live content.

### **Does machines understand?**

To “understand” and “understanding something” is about something being comprehensible for someone, and it goes deeper than only knowing how to operate a product, but rather why this action makes a product do something, and the thought behind it. Like Bratteteig and Verne wrote “*machines cannot reason, only calculate*” (Bratteteig & Verne, 2018, p. 2), and while calculating also is a way of understanding something, reasoning goes to grasp the deeper meaning of some actions or reactions.

In this sense I think that while intelligent machines is able to calculate their actions, like the robot lawn mower, their scope of calculations are mostly based on what their creators wanted them to be able to understand from their calculations. I don't think that it is easy for us to know what intelligent machines understand either, as we mostly only interact and see their output and not their design rationale. Like in the article by Verne, her realizations of what limited the robot's job in the garden was made by her alone, as the robot didn't necessarily evaluate or calculate every obstacle and give her a message about removing the hinderances.

## 1.4 Guidelines for Human-AI interaction

### Microsoft's Human-AI Interaction design guidelines

I chose guideline no. 1 (Make clear what the system can do). The example made by Microsoft was that this guideline is needed to make the user understand what the AI-system is capable of doing, but I also find it relevant to make the user understand what the systems can't do as well. As mentioned above about understanding – this guideline makes it very important to understand the constraints and limits about what the system offers, so that the use of the system is optimized.

I chose to look at Nielsen's 10 usability heuristics in comparison to Microsoft's guidelines. In general, many of the heuristics are similar with the guidelines in the sense of focus on usability, feedback and prevention of errors. The first heuristics "*Simple and natural dialogue*" (Nielsen, 1994) targets the same area as "*Show contextually relevant information*" and other guidelines, because of its focus on usability and limiting overload of information – especially technical information that is not relevant for the user in the context of their use.

One thing I feel is slightly different in the two sets of guidelines is that Nielsen specify a heuristic about giving the option of shortcuts to the expert users. Although this could be made possible by Microsoft's 13<sup>th</sup> guideline about learning from user behavior, it doesn't necessarily give the user this option in the first place.

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