Individual assignment in modul 1

1.1 Concepts, definition and history of interaction with AI and autonomous systems

The term Artificial Intelligence was introduced by John McCarthy at a workshop in 1956. This sparked optimism about AI's potential, despite later setbacks. The roots of AI is from post world war 2, including pioneers like Alan Turing, a british mathematician and logician. The reason was that after the war, governments funded the building of expensive computers at a few universities. He envisioned computers capable of intellectual tasks. In the 1950s, AI researchers (Grudin, 2009).

Three different definition of AI

Given three different definitions of AI, they define it differently. First definition by Bratteteig and Torne, talkiing from a participatory design view: "AI is a subfield of computer science aimed at specifying and making computer system that mimic human intelligence or express rational behaviour, in the sense that the task would require intelligence if executed by a human" (Bratteteig & Torne, 2018). This requires that the task are given from a human, and is more difficult, compared with in the past, where the AI was based on algorithms or mathematical/ logical solving.

The second one is not a direct definition but a statement from the pioneers of AI: "... viewed computers as locomotives of thought, which might outperform humans in higher mental work as prodigiously as they outperformed them in arithmetic, if they were harnessed to the right programs" (Grudin, 2009). I think what they mean here that AI can outsmart humans.

The third definition from IBM: "Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy. " (Stryker & Kavlakoglu, 2024). This definition can be understood that it have many of the same qualities as a human.

The difference between human and machine autonomy

The main difference between human and machine autonomy, is that humans can express feelings genuinely, something the machine can't do without learning them to do it. Different machine have different autonomy, like different types of robots. Industrial robots have the lowest level of autonomy, because they work in environments for specific and repetitive tasks. While service robots operates in more complex environments, like a museum tour guide robot (Thrun, 2004). This shows that different machine have to learn different things, and can't do everything at once, which depends on the creator.
Some similarities, even though both of the autonomies handle things in their own way. Both do take decision and work forward what they are supposed to. For example an electric vacumer, tries to get to all areas in the house. They both try to solve problems, humans may have more ways to solve one problem.

The concept of automatic is at an intermediate level of intelligence, and can take over control that used to be done by people, for example in high risk industry (Norman, 1990). The concept of autonomous can be machines or AI, that do tasks without need of any interruption from humans, for example feed plastic bottle in a machine (Bratteteig & Turne, 2018, p. 4). Some similiarities is that the both concept is based on learning the machine to do given task, but the first one have limitations. Both are designed to reduce the need for human interaction in tasks, for examples automatic is at an intermediate level of intelligence (Bratteig & Turne, 2018).

The article "Does AI make PD obsolete?: exploring challenges from artificial intelligence to participatory design", is about how AI challenges PD, based on the characteristics to AI and machine learning. The article makes me wonder how AI will affect the design process in the future, will AI ever substitute humans in the process? Based on the article it doesn't seem like it right now because it doesn't have emotion or same cognition.

Apple is an example of a company that work with AI through different features, like Siri (personel assistant). In this site, the company present the new updates on AI features that includes writing tools, that helps with writing, summaruze etc. Create images through your own sketches and description. Last, integrating chatgpt into Siri and Writing tools. Apple talks about AI. I would say that Apple talks about AI in

different ways. The different features as product on the different platforms, an service as in Siri and writing tools (apple, 2024).

A fictional movie that is about the use and interaction with AI between people is Interstellar (https://www.imdb.com/title/tt0816692/). The movie is about a ex-Nasa pilot that is dreaming about to find a new planet for humans to live on with a team. This robot that they travel with named “TARS”, can communicate with them, where the team could ask questions and it gave feedback. For example, in one of the scenes, the pilot had to find a way to communicated with his daughter by translating data into Morse. But there was time where the robot couldn’t answer everything, because it wasn’t learned to do so, it has limits. This can for examples compares to chat-gpt and siri, where you ask question and it answers you, but these also have their limitations, because of what they have learned from their creator.

1.2 Robots and AI systems

The term “Robot” have had different meaning through decades, since the field is changing at an unprecedented pace (Thrun, 2004). The first use of robot were in a playwright about mechanical men that built to work on factory and rebel against their creators, R.U.R, by Karl Capek in 1921 (Science friday, 2011).

There a multiple definition on the term Robot. First definition from the Robot Institute of America: “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”. Another definition from the Merriam Webster’s collegiate dictionary: “An automatic device that performs functions normally ascribed to humans or a machine in the form of a human”. (Thrun, 2004, p. 11)

My definition of the term Robot, I think it has to be physical because it needs the different materials, parts and tools. It has to be the human giving the task because they are programming the robots themselves. With my definition, I don’t think chatbot is a form of a robot, because it’s not physically. But at the same time, it is programmed to answer like a human. If there is a voice activated speaker, that is a robot because you have the product that is the speaker.

I think AI and Robots are both similar and different at some point. The first definition, robots have to be physical because it is a design with materials, parts and tools, and they are given task to do. While AI is based on based on the definition given by Bratteteig and Turne, that AI is a computer system. They are both similar that they both have to learn from human, to make it possible to do the tasks, and they both can't replace human-to-human interaction in realistic situations (Holmquist, 2017 ,p. 31). AI needs learning, therefore it can draw or own conclusion from the data and improve their performance, which can result in becoming better or worse (Bratteig & Turne, 2018, p. 3).

An example on a commercial robot is, IRobot, a robot vacuum that cleans around the whole house automatically, without the user need to do any clean work. It moves by learning from the cleaning history, so it automatically can clean the rooms. When it moves and cleans, it doesn't try to vacuum everything that is in the way, an avoid object that is in the room and also pet waste. The user interact with the robot with an mobile application, by telling it where to clean. (irobot, 2024)

1.3 Universal Design and AI systems

Universal Design is used for the design buildings, environments and products are accessible for all. In design there are multiple frameworks (FATE and "The three dimensions of inclusive design") and principles (WCAG). I understand this term about how can you make a design for everyone can use, regardless of condition or impairing functional ability. Since there are all type of people that use the technology, by including as many as possible, it will make a smaller gap between the society and people (Uutilsynet, 2024). I think universal design is important, because the world is moving forward with digitization in society. For example Ruter, that is a collective transport. Before they had tese ticket machine on the stations, while now they only have a few places where you can get the ticket physically, and more people use their application.

Human cognition can't be understood as information process, or represented by algorithms or in a machine (Bratteteig & Verne, 2018, p.2). The current approach to

AI, is learning based on the data, to learn to recogniza specific things, for examples image recognition, machine translation and speech synthesis.

With AI systems it has voice recognition, it enables talking to the computer instead of using the tastatur and mouse, for example through windows (Microsoft, 2024).

One example is schoolai, that is using AI actively for student to access information in differents ways and learning opportunities. It includes text-to-speech function, so AI can read aloud the conversation. And opposite with speech-to-text-tool were student respond verbally instead of writing it (edutopia, 2024).

Pymetrics is a platform that hires people through using data driven behavioral insights and audited AI. It starts with taking these tests and through those, it will calculate your skills or if you have any impairment (pymetrics, 2024).

Based on the examples over, AI have potential for including people. Already by now there is different tools that can make the everyday life better, school and work related. There is talk about self driving cars in the future. AI can exclude because ML is changing over time and can be unpredictably. For example challenge the basic PD value by securing control of the users own environment and tools (Bratteteig & Turne, år, s. 4).

The concept “understand” is to get to know the meaning behind something, while “understanding” is that you actually know the meaning. The question: Do machines understand? Can be discussed. I think machines do understand, but only what is is learned to do. But when the machine get a task it never have met, it will not understand. The machine do understand, but there are limitations.

1.4 Guideline for Human-AI Interaction

Guideline 13 Learn from user behavior, for human-AI interaction from Microsoft, is about personalize the user’s experience by learning from their actions over time.

Example can be when you do online shopping or looking at items, it will recommend similar items based on history.

The set of HCI design guidelines that I want to compare to is Nielsen's Ten Usability Heuristics, compared to the Human AI interaction guidelines from Microsoft. As seen the principles from both of them do have similarities. Both of them is about how to design usable and user centered.

Overrall it is two different guidelines in different fields. While the principles from Microsoft include AI. Nielsens heurestics is for just usability, while guidelines from Microsoft is to support and stimulate conversations about design decisions between user experience and engineering practitioner (Amershi et al., 2019).

1.5 Journal - everyday engagement, interaction and use

When I started to journal with pen and paper, it was floating and further in it was sometimes i felt tired in the hand. But it was a nice feeling, because it felt more personal as it was my own handwriting and style. When the time was over, I wasn’t finished, because I like to use good time when using pen and paper.

Journaling with QWERTY keyboard and screen, was going way faster and I finished some seconds before the time was over. The typing went pretty smooth, and if I wrote something wrong, it was easy to erase. The feeling I had wasn’t the same like journaling. When I typed on the computer it feelt like doing a school assignment.

Journaling by audio, was the way i liked the most. It felt like I was talking to another person, like storytelling. And I just said everything I felt in the moment without thinking, it didn't feel confusing to go from one theme to another in seconds (or in my head at least).

Litterature

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Appendix

Two stars:

- I liked reading your own definitions and reflections
- Your experience with the different ways of journaling was interesting.

One wish:

- More detailed descriptions and examples of the potential of AI and AI applications to exclude certain groups would be interesting.
- There are some Norwegian words in the text, e.g. påvirke, uansett, møtt på.

Based on the feedback, I chose to fix on the norwegian words so the text could float more.

Modul 2

Key characteristics of AI - infused systems

Based on Amershi et al., the article talks about several key characteristics of AI-infused systems. That the advance with AI is that it are enabling to integrate a variety of AI capabilities into user-facing systems, for example improvements in pattern recognition accuracy have driven the integration of translation, speech and object recognition. But these systems are performed under uncertainty, that can demonstrate unpredictable behaviours that can have consequences. Some advances are automatic content filtering based on relevance, when they match user preferences but might also hide important information and go against user goals (behind the scene). What is common for all AI-infused systems are errors (Amershi et al., 2019).

Kocilnik et al, does mention the consequences with errors, that AI functionalities are probabilistic and almost always operate at less than perfect accuracy. Where most user don’t expect inconsistency and imperfection that can lead to disappointment and maybe even abandonment (Kocielnik et al., 2019).

Yang et al. describes that AI-infused systems are difficult to control and keep track of. And the main point of this article is that it is difficult to design human AI interactions, and shouldn't reject AI’s capability, uncertainty or output complexity/unpredictability. Understanding how to leverage AI’s unique qualities for human benefit while minimizing unintended consequences is essential (Yang et al., 2020).

Example on an AI-infused system - Instagram

An example of an AI infused system is Instagram. AI behaves based on the user interaction, and will recommend the user which posts and accounts will show up on their feed. These recommendations happen “behind the scene” based on users

interest. If the AI makes mistakes by showing content that users are not interested in, it can lead to disappointment.

When AI shows content the user is not interested in, it could be because the user watch a profile, post or reels it will affect the algorithm, whether they are interested in the content or not. This is because AI- infused systems are probabilistic. But the platform has a button that you can click on, if the user is confused why they get certain content on their feed, and it will show the reason why.

Human-AI interaction design

Summarize of Amershi et al. (2019) and Kocielnik et al. (2019) article

Amershi et al. article emphasizes the need for continued innovation in user interface design due to advancements in AI. The authors propose 18 validated design guidelines for human-AI interaction, confirmed through evaluations with design practitioners using popular AI-infused products. These guidelines are relevant across various interaction scenarios and highlight areas for further research.

Kocielnik et al. article presents expectations of the capabilities of AI-infused systems vary among people. They explore how AI components are designed with different focus on the types of errors to avoid lead to different subjective perceptions of accuracy and acceptance (Kocielnik et al., 2019).

Both articles discuss problems with designing AI-infused systems, from different perspectives…

How design guideline can improve Instagram

Design guideline 13 Learn from user behaviour, can be useful. Instead of making recommendations based on a one interaction with one profile, reel or content, it should be based on the majority of interactions. The consequence of this can be one sided content.

Design guideline 18 Notify users about changes, is something Instagram can improve. Instagram updates new features and updates often, but should be clearer to notification the users about the specific capabilities of new AI features. So the users gets a clearer picture on what they can eventually do, for example how to influence content recommendations from AI. Some challenges can be that it can interrupt the users experience on the platform, if they are perceived as intrusive.

Bender et al. (2021) - main challenge with large language models

The article discuss and investigate about possible challenges when using large language models for AI systems. The first problem is that LLMs are trained on large data sets which can lead to overrepresentation of dominant viewpoints and can result in damaging marginalized populations. The second problem is when training these large models, it consumes computational resources and can lead to environmental damage, but also financial burden. Last, Bender et al. critizie the tendency of LLM to produce text that can seem meaningful, but warning that:

“LMs are not performing natural language understanding (NLU) and only have success in tasks that can be approached by manipulating linguistic form." (Bender et al., 2021)

All these aspects point out the risk when relying on larger language models. Therefor should be careful and suggest exploring alternative approaches to NLP, that don’t only rely on scaling model size.

Conversational user interfaces to large language models

Challenges when designing AI infused systems

A key challenge in designing AI infused systems, is the interaction between the design and what the chatbot is capable of: “Designers frequently report that it is difficult to grasp what AI can or cannot do” (Yang et al., 2020). It can be difficult to map out if the bot understands or not, and further can make it difficult to create an interaction. This can result poor interaction between the user and the chatbot.

The articles from Amershi et al. and Kocielnik et al., discuss how expectations with AI systems can have an influence on the user experience. For example, by not giving clear instructions this will lead to bad user experience.

Challenge - lecture

Guidelines in Amershi et al. (2019) to resolve challenges connected to large language models

The first guideline: “Make clear what the system can do”, can resolve some challenges. It will overall lower the users expectations and creates an understanding of the AIs capabilities. By giving limited options or information of what the communication can consist of or not, the disappointment for the user will lower. For example use of chatgpt, it will answer “I can't answer this”, because it may be too complex for it and it gives an indicator to the user.

The second guideline: “Make clear how well the system can do what it can do”, is connected to the first guideline. I think if the chatbot answers or ends the statement on if it can answer the question or not, is important for the user and may lead to a better experience.

Overall these guidelines will help to improve the user experience and reduce frustration from these systems, because of users already expectations.

Litterature

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