

Individual Assignment IN5480

h2020

Module 1

1.1

It can be argued that the concept of artificial intelligence came about during World War II tho not known by that name. Alan Turing who played a major part in making the enigma machine in World War II to break the encryption code the nazi troops used when sending messages wrote in the London Times of 1949 "I do not see why [the computer] should not enter any one of the fields normally covered by the human intellect[...]"(Grudin 2009). This was followed by more people talking about the potential of a computers computational power. " The term artificial intelligence first appeared in the call for participation in a 1956 workshop written by American mathematician and logician John McCarthy" (Grudin2009). In the 1960s to 1970s AI became a popular field to research. Tho in the mid 1970s AI lost popularity as people meant that AI was oversold and HCI started to be a more popular aerie for research. In the early 1980s AI got another bump as the US got wind of the fact that Japan had made an advancement in AI technology with a "Fifth Generation" AI. Then came the 1990s where AI once again met a wall because there had been a lot of resources allocated to develop AI and not enough results.

SNL - defines AI to be "Kunstig intelligens er informasjonsteknologi som justerer sin egen aktivitet og derfor tilsynelatende framstår som intelligent." TL: Artificial intelligence is information technology that adjusts its own activities and therefore appears to be intelligent. It's hard to determine exactly when this definition was formulated but it is based on the editing history of the online Encyclopedia I'd say it's from a time between

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2016 and 2020. This definition is taken from the encyclopedias definition of “kunstig intelligens” TL: Artificial Intelligence.

Oxford Dictionary of English - defines Artificial Intelligence as “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” I can’t determine when this defined was formulated but it is the current definition in the dictionary. This definition is a definition that is agreed upon by the University of Oxford.

B.J. Copeland professor of Philosophy at the University of Canterbury writes for Britannica that “Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. Although there are no AIs that can perform the wide variety of tasks an ordinary human can do, some AIs can match humans in specific tasks.” The latest update is 2020.

I would define Artificial intelligence as “A digital system that is able to perform a task that normally would require human intelligence to be performed and as such is able to mimic an aspect of what we commonly think of as intelligence such as image recognition, speech recognition, and decision making” my definition is based on what i personally think of when trying to explain AI to someone else. It is obviously colored by the tree definitions listed over as these are fresh in my memory as I'm making this definition but it has the essentials I think of as AI that it is able to appear to mimic intelligence.

Google work with AI and on there web page they presents AI as a product that everyone should have access to and that will help you in your everyday life with things such as live translation of tekst with the use of a camera, recognizing different plants and animals, and being something anyone that so desires can use fore there one projects. It's also about how AI can help Google organize the world's information and make it accessible to everyone.

In the computer game Portal 2 the interaction between human and AI is in some sense that of a tester and a test subject in the sense that an AI is putting the player/human through a bunch of tests and giving the player/human condescending comments on their performance. There is however also another AI that tries to help the player/human escape from the "evil" AI and here there is the representation that most people would like an AI that works with the humans to fix something whilst the prior interaction of tester and tested presents an "evil" AI that does anything to achieve their goal even if that ends up hurting the human.

1.2

The word Robot comes from a play of the name Rossum's Universal Robots (1920) written by Karel Čapek where he presents a company that produces a machine that can do anything a human can do, but does not have a soul and such don't have human emotions.

Oxford Dictionary of English - defines Robot as "a machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer"

SNL - defines Robot as "Robot, en datastyrt enhet som ved hjelp av sensorer kan motta data fra omgivelsene, bearbeide disse og reagere ved å iverksette handlinger i henhold til forhåndsprogrammerte regler." TL: Robot, a computer-controlled device that, with the

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help of sensors, can receive data from the environment, process it and react by taking actions in accordance with pre-programmed rules.

I would define a robot as “A device that can move in our 3 dimensional space on its own with the help of information it gets for a computational device. The computational device takes in signals and sends signals to the limbs of the device so it moves.” I think this is a good description of a robot as my perception of a robot is something able to move in our 3 dimensional space to writing degrees with the help of a digital “brain” controlling its movements. This corresponds to the fact that “there are many ways a robot can move” (Schulz, T., Herstad, J., & Torresen, J. 2018) indicating that it doesn't have to move in a specific way.

AI and a robot can work well together seeing as they are manley made to mimic something a human would originally be doing, a robot is mainly made to do the physical actions a human would normally be doing, and AI is mainly made to do work a human normally would have to do in the sense of “thinking”. But a robot does not need an AI to work. A robot such as a drone does not need a AI to work it's controlled by the human with the remote and such it does not have” A digital system that is able to perform a task that normally would require human intelligence to be performed and as such is able to mimic an aspect of what we commonly think of as intelligence such as image recognition, speech recognition, and decision making”. Seeing how a robot and ai are different based on the one fact it is also different in that an AI dosn't need to be “A device that can move in our 3 dimensional space on its own with the help of information

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it gets for a computational device. The computational device takes inn signals and sends signals to the limbs of the device so it moves.”

In the assembly lines of Toyota there are loads of robotic arms that do one specific action over and over again. These robots are being monitored and configured from an office in the building so the human robot interaction is mainly done over a computer except those that interact indirectly with the robots when delivering the parts to be assembled where they deposit the materials in a designated place and the robots come to pick them opp later.

1.3

DO IT -defines “Universal design is the process of creating products that are accessible to people with a wide range of abilities, disabilities, and other characteristics” I understand this description of universal design towards the fact that it is meant to be accessible to as many people as possible regardless of veter they have reduced abilities or an disability. With this it is meant to include as many people as possible.

AI can be an amazing asset for people such as speech recognition and speech synthesis that gives us the ability to talk to the AI and it is able to answer which can make people think that the machine is more human than when we just have a keyboard, mouse, and screen. AI is also a huge help for people with problems with sight and/or reading making the system accessible for them to use with their voice.

I mean that “understand” is the static understanding of something like what you can get from reading a book while “understanding” is more the capability of reflecting upon something and recognising similar situations and working upon them. I personally mean that a computer can understand something, but it can’t have an understanding of something. This meaning is based on how i mean that to understand is more a fact then a thought whilst understanding is what requires a deeper knowledge.

1.4

Microsoft's Guidelines for Human-AI interaction 1. "Make clear what the system can do" is about letting people easily understand what the AI is able to do and what it can't. I chose one of Norman's Seven Principles "Make things visible." which is about making all the functionality of the system known to the people that are to use the system. There are similarities between these two which are that you should let your user know what the systems are able to do. They are also different in that one is to make it visible and the other make it known not necessarily visually.

Module 2

2.1

One characteristic of an AI-infused system is that it has an elevated capability to see patterns and use them to improve the experience. One such advancement that is normal for a lot of AI-induced systems is speech recognition "increases in the accuracy of pattern recognition have created opportunities and pressure to integrate speech recognition" (Amershi et al. (2019))

With the increased pattern recognition capabilities of AI there are also things like image recognition and face recognition. A more broader characteristic of an AI-infused system

is that it learns what the user wants/is interested in and as such can make a more personalized experience for the user.

Another characteristic of an AI-integrated system is the uncertainty of the system as it is learning as it is being used and as such don't have a set outcome but rather a hopeful outcome.

Spotify is a system that integrates AI to give you music suggestions. The AI in spotify is reasonably good at seeing patterns and such given that you have a specific taste in music it's mostly capable of finding music you are interested in. This is a good addition to spotify if you have a playlist with a consistent theme the AI is capable of continuing the playlist with a "radio" generated by spotify algorithm based on what others that listen to that type of music taste listen to. Spotify also tries to make you playlists with music you might like. This is to a more wearing degree especially if you listen to different types of music based on your mood. Just listening to a couple songs out of your normal pattern will make the spotify AI confused and add in music you might never listen to normally in your personalized playlist.

2.2

Amershi et al. (2019) is about making guidelines on how to design human-AI interaction and how this has advanced over the years. With many bases in research. It also talks about the potential problems AI-infused systems can face like false results. The main thing to take out of this article is what to think about when making human-AI interaction.

Kocielnik et al. (2019) talks about how people's initial expectations of an AI-infused system determines how pleased they are with the system and has a hand in whether they continue to use the system or drop it. It also takes about peoples reactions to false positives and false negatives. In this article it's most interesting to look at how the initial expectations impact whether people use the system or not in the future.

G13 from Amershi et al. (2019) is “Learn from user behavior. Personalize the user’s experience by learning from their actions over time.” In regards to this guideline the spotify AI is most certainly following it but maybe it is overdoing it a bit and learning too fast and such making mistakes that could be avoided if the system was a bit more careful in learning for the user. This brings us to G14 from Amershi et al. (2019) witc is “Update and adapt cautiously. Limit disruptive changes when updating and adapting the AI system’s behaviors.” as to this point I’m more uncertain as to weather or not the spotify AI is following this guideline I personally think that they are probably following it to a certain degree but not enough to convince me that it is since it’s so easy to mess up the generated playlists by listening to barley any songs out of your usual listening pattern

2.3

With conversational user interfaces it’s important to make it clear how it works and what it can do as is written in Liao et al. (2020) as the advancements in AI and Machine Learning are so rapide it’s important to let people know how it got to that conclusion. If an AI fulled conversational user interface is to help in the medical sector it might not be enough with just “a model predicting a patient having the flu may explain by saying “the symptoms of sneeze and headache are contributing to this prediction” [74]. However, it is questionable whether such an explanation satisfies a doctor’s needs to understand the AI”(Liao et al. (2020))

A chatbot is something made possible troue the use of AI “AI holds many promises for improved user experiences (UX), and it enables otherwise impossible forms of interaction” (Yang et al., (2020)) As a chatbot is using AI to function there is the potential problem of it misunderstanding the input it gets, and giving a wrong answer.

G1 Make clear what the system can do. With implementing this you can make the user aware of the fact that the system is not perfect and can make mistakes and thus making

the user a bit more aware of potential misunderstandings and perhaps even stop miss information to a certain degree.

G2 Make clear how well the system can do what it can do. If the system adheres to this guideline then users will have a more realistic expectation on what degree of reliability the system offers.

Modul 3

Philips et al. (2016) writes about taxonomy and examples of human-robots collaborations, I'm going to focus on Big Dog and Paro. When it comes to Big Dog it is a robot developed by Boston Dynamics to help carry cargo. The robot is made to mirror a large dog or a small mule, this design is supposed to help it maneuver in rough and uncertain terrain. Raibert et al. 2008 writes that the Big Dog should have the capability to maneuver on its own with a minimum of human guidance and intervention. The Big Dog is equipped with multiple stereo cameras and a lidar (distance measuring using light) with the images from the stereo cameras and the model made with the help of the lidar and some other stabilizing technology Big Dog is able to stay on its feet on many different terrains. Taking this into consideration if I'm to place it into the human-centred AI grid presented in Shneiderman (2020) I'd place it at low to moderate human control and high automation. In the case of Paro, it is made to be a social companion to combat loneliness with elders. Paro is made to look like a seal and is enveloped in soft material making it cute and soft to the touch. The social robot Paro can detect external stimuli like audio, touch, and light with this the seal can respond to human interaction. The Paro robot takes in human interaction, but based on this interaction Paro decides on its own what to do and how to react. Paro can respond with movement and sound. I'd say that Paro is fully autonomous, it takes in external stimuli but the response is completely up to Paro and not controlled by a human.

Decrease/increase their autonomy

Big Dog is mostly autonomous but it might be improved by increasing the autonomy as this will make it so that the users no longer need to keep an eye on Big Dog when moving. With increased autonomy there is the problem of the Dig Dog and newer robots from Boston dynamics not being able to identify if an object is solid or not like snow or bushes which gets identified as a solid object but is not safe to walk on. With a decreased autonomy the Dig Dog could potentially get more human controlled and be used as a remote controlled unit to transport cargo to a remote location. Something I think would be the best is to increase both the autonomy and the human control potential so that the Big Dog is able to control its balance and take decisions to keep itself safe like not walking off a cliff or stepping in a hole the human might not have noticed. Paro is one system that I don't think would benefit from a decreased autonomy as it's a social robot made to interact with elderly. If Paro does not respond convincingly it might end with it no longer being useful in this field anymore. Increasing the autonomy of Paro could be a double edged sword as it could become more realistic as a social companion but it could also scare the elderly that is to use the seal.

Current and needed explainability

For Paro, explainability might not be desired by all users but according to Smith-Renner et al. 2020 trust and acceptance is affected by explanations and feedback so maybe increasing the explainability can make Paro more accepted in the US and Europe. Explainability of Big Dog is pretty good as Raibert et al. 2008 contains a good amount of information on how the system functions, but not a complete description of every part of the system. Getting more knowledge on the inner workings of the Big Dog might make it

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easier for the humans interacting with it to understand how it makes decisions and if these decisions are the right ones “Safety: Can we gain confidence in the reliability of our AI system without an explanation of how it reaches conclusions?” (Hagras, 2018). As Big Dog is meant to be a military robot it’s important that the users feel safe that the decisions Big Dog take are good decisions.

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Feedback

I my feedback i got asked to fix my references and not separate them based on module I have addressed this and removed the dividing of the references