

Modul 1: Individual assignment.

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

During the World War II, code breaking and the understanding of coding were significant. And after the war, a few universities had the opportunities to build computers on campus. In 1949, Alan Turing, a British mathematician, wrote in the *London Times*, “I do not see why [the computer] should not enter any one of the fields normally covered by the human intellect, and eventually compete on equal terms.” (Grudin, 2009:49).

The founder of artificial intelligence, John McCarthy, introduced the term AI to the world in 1956. It was after a conference in Dartmouth College, where McCarthy was one of the main speakers. The conference was called *Summer Research Project on Artificial Intelligence*. Together with Turing, Newell, Simon, and Minsky, they are all seen as the creators of the term Artificial Intelligence.

1960 – optimism in computer development and a lot of money was given to the study of artificial intelligence.

1970 – is called the artificial intelligence winter, because the results were not coming as planned. The refunding was cancelled and further research limited.

1980 – Optimism where back and expert systems were introduced in the shape of artificial Intelligence. But they were not able to redeem to the point promised, another period of AI winter came back, and lasted until the mid 1990.

In the late 19th early 20th century AI was again peeking. In 1997 Deep Blue, the computer beat the world champion Gary Kasparov in chess (Grudin, 2009:54). Deep Blue is different from most AI used today, but made an introduction and surprised many, including long-time AI critic Hubert Dreyfus, author of “What Computers Can’t do.” (Grudin, 2009:55).

John McCarthy(1998)

“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.

With this definition McCarthy (1998) concludes that you need human beings for making the inputs to the machines that will improve the capability and enhancement of the machine. The machine can understand human intelligence and help with the interaction between humans and machines.

Bratteteig & Verne (2018)

“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”.

Bratteteig & Verne (2018) discuss in their definition that machine will learn from participatory design. The machine will gain knowledge from people interacting with them. Commencing with human beings the machine will learn rational behaviour, and then become more intelligent.

Axel Tidemann (2020)

Artificial intelligence (AI) is information technology that will adjust it’s own activity and therefore appears to be intelligent.

The definition of Tideman is that AI can learn from mistakes and diverse input performed by humans. The artificial intelligence can execute different assignments from the history of tasks performed earlier.

Vibeke Johnson (2021)

”Artificial Intelligence has the ability over time to advance from the information provided by humans, and learn from previous tasks performed”.

With this definition I mean that artificial intelligence has the possibility to become more intelligent, when additional information is encoded and the process has started. After some time the AI will acquire properties from earlier assignments performed.

The article by D.A Norman

The “problem” with automation: inappropriate feedback and interaction, not “over-automation”(Norman, 1990).

This article discusses how automation is present in the industry and how the design of the automation is more of a problem than the automation itself. Norman is looking at automation in aviation, and this appeals to me as I am currently working as an airhostess. Norman is looking into three accidents in aviation and how the automation and overall communication and understanding had an impact on these accidents to occur.

The first comment on this article has to be that the accidents happened between 1975-87, and automation in aviation has developed a lot since then. After discussion with captain Larsen in SAS, I have studied this article and I do agree and disagree with some of Norman’s views of the topic. After every accident happening in aviation, several documentation and reports were made, and flight safety is updated. The one case where the incapacitation of the pilot occurred, this would probably not happen today. From previous accidents they have implemented communication techniques (challenge-response) in their flight safety and Standard operation procedures (SOP). Norman also states that pilots are “physically isolated from the passengers and from any difficulties that may be occurring within the passenger section of the plane” (Norman, 1990:138). The flight attendants have nowadays more communication with the pilots, we are their eyes and ears in the cabin. And the threshold for calling and communicating with flight deck is low.

Automation in airplanes is important, and the Scandinavian Airlines System (SAS) implies that the highest level of automation is required in every flight. From this article written in 1990, pilot and automation in aviation have evolved. Pilots are more aware of the design of the automation and have a better understanding of the intelligent system (automatic pilot). I do not agree with Norman “the implementation of some new “improved” automatic system, warning signal, re-training or procedure is really a sign for poor overall design”. Be aware that you cannot trust automation totally, and train for different situations can arise is important.

PICKR.AI

The contemporary company “PICKR.AI” has specialized themselves in robots with AI. The robots are made with the purpose of optimizing the warehouse storage facilities. The robots have a suction tool and camera attached, and they use this to recognize the different products and therefore learn by themselves. A 3D tracker is made in the robots to recognize small parts and pick these with their suction arms. AI takes a picture of the product and sort it by percentage of similar product seen before. These are autonomous and articulated robots that

are used in picking production. This robot will improve the time used by companies in storage to streamline the storage facilities.

Westworld – HBO series where the robots are made to look like humans. The machine act and look like human, they have the same skills and are able to imitate them. But after a while, the robots start thinking and learning by them self (“The Turing test”), this causes the robots to make a riot against the world they are living and against the humans. The communication between the robots and the humans is fascinating. You cannot tell the distinctions between who is human and who is a robot. Because of this, a few humans die from other people not telling them apart from the robots. Westworld is made for the futuristic imagination of robots taking over the world.

1.2 Robots and AI systems

Robot - *robota*, for “servitude,” “forced labor” or “drudgery.

Karel Capek (1880-1938) introduced the word ”Robot” in his play called Rossums Universals Robots (R.U.R). The ”Robots” where going to do the same work as the people, and he named them ”Labori” after labor for English. He later called them roboti, because it did not sound so bookish (sciencefriday.com).

Robots.ieee:

”A robot is an autonomous machine capable of sensing its environment, carrying out computations to make decisions, and performing actions in the real world”. (IEEE.org)

This definition means that the robot is able to adapt to the environment, and learn from tasks performed earlier. The robot is made with a specific intellectual to execute action in the real world. It is a software robot, installed with AI to make it intelligent.

Merriam-webster:

”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.com)

By this definition a robot is made human like, made to perform special tasks as to move and handle objects. They can be made without AI. Many robots that are made for a specific task as picking up an object do not have Artificial intelligence.

My definition of a ”Robot”:

“A robot is a machine that is made to perform any given assignment. It can be built in different shapes and perform specific jobs depending on if the robot is made with software AI or without.”

I think robots can come in various shapes, and are made to perform specific tasks. You have robots made for space, robots for home use or robots to interact with humans.

Robots and AI.

The relation between AI and Robots are that they both need input and interaction from human beings to work. Robots are the physical version while AI is the software. We have non-intelligent and intelligent robots. The Artificial Intelligence is the software that is built in the intelligent robots. The robot can work as a shell of the AI, a physical manifestation. AI is the software of machine learning, intelligence and consciousness, and a robot can execute these

tasks. A software robot is intelligent, and for example, a self-driving car has a built-in AI that will tell them if some obstacles or danger is about to occur. Challenges have been identified with Tesla when they came across situations they did not have information about in advance, which led to accidents. This would probably not have happened if a human were driving the car.

AV1/No Isolation

AV1 is a communication robot made for children that cannot attend school. The robot is used in their place in class, recess or field trip. The kids can control the robot from everywhere, with phone, ipad or a computer. The kids use the robot as their eyes, ears and vocal in school. AV1 has a built in speaker, camera and microphone in the robot (noisolation.com).

1.3 Universal Design and AI systems

Definition of Universal Design:

”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).

With this definition it is indicated that universal design is design made to include not exclude people. Regardless of different disabilities, physical or emotional state, people shall have the opportunity to use everything provided in the environment, from buildings, computers, products and much more.

Artificial Intelligence - human perception, human movement and human cognition/emotions.

Artificial intelligence has the opportunity to assist humans with practical, emotional or physical difficulties. With Artificial Intelligence we can implement and accomplish some of the same as human perception. In addition, we can make computers by coding them to perform similar logic and decisions comparable to humans. An example would be smart homes, and how people with cognitive disabilities can be helped with everyday tasks. The vacuum (robot) can understand where to go and will know when the battery is low. They can have a smart panel installed that will understand and assist with everyday chores. It can perceive information of something at home is not working, or threats are happening.

AI - including and excluding people.

I think artificial intelligence have the opportunity to include but also exclude certain people. With all the different communication platforms, like Smartphone's, Skype and video calls some people have difficulties using these. A way to include them, a smart speaking is made for them to talk to day or night. Smart speaker is a way to include old people who live alone and cannot use the other platforms of communication.

The other example is face recognition, how they exclude people with dark skin. The computer cannot read the features of the people with dark skin and therefore exclude them from this.

WCAG 2.1 principles – understand and understanding.

Do machines understand?

Humans have the ability to understand and interpret other peoples feeling by communicating verbally and non-verbal to each other. Artificial intelligence has to understand humans by the information given to them. AI will then “understand” humans in some extent, they will recognize the information given to them and use this to interpret with humans. My conclusion

of “Do machines understand?” I will emphasize the word to understand. “*To know how someone feels or why someone behaves in a particular way*”(dictionary.cambridge.org). Machines can to a certain extent understand the input provided to them and use this information to understand the user. But they will never have the human understanding of feelings.

1.4 Guideline for Human-AI interaction

Microsoft Guideline number 13:” Learn from user behaviour - Personalize the user’s experience by learning from their actions over time”.

This guideline means that the system has to pay attention to the previous action in intervening. For example, Spotify lists, remember the songs played and recommend similar songs in the same category. So with this guideline I found a similar one by Nejc Rodosek “*We can create the great user experience, only when we understand the user motivation that guides the action*”(Nejc Rodosek, 2018).

Similarities and differences between the HCI design guidelines and the Human-AI interaction guidelines.

From the book “Design of everyday things”, (Norman, 2013), we do get an insight in the six principle of Human-Computer Interaction.

“Usability, feedback, affordance, mapping, constraints and consistency”(Norman, 2013).

Norman use universal design principles to understand and design products that are technological. From designing everyday things from table, doors, thermostats and so on, he uses parallel on how to design technological products user-friendly. Microsoft Human-AI guidelines also write about the importance of user experience, but they differentiates in the way that Norman’s guideline are more nonfigurative. The Human-AI interaction guidelines have four main areas and many more sub categories to specify the interaction.

References

AV1/No Isolation. URL: <https://www.noisolation.com/no/av1/> accessed September 7, 2021.

Axel Tidemann 2020. Stor norske leksikon.
https://snl.no/kunstig_intelligens accessed September 5, 2021.

Bratteteig, Tone. Verne, G. Does AI make PD obsolete?; exploring challenges from Artificial Intelligence to Participatory design. URL: <https://dl.acm.org/doi/10.1145/3210604.3210646>.

Cambridge Dictionary. Dictionary.cambridge.org. URL:
<https://dictionary.cambridge.org/dictionary/english/understand> accessed september 8, 2021.

Dautenhahn, K., 2018. Some Brief Thoughts on the Past and Future of Human-Robot Interaction. ACM Trans. Hum.-Robot Interact. 7, 4:1–4:3.
<https://dl.acm.org/citation.cfm?id=3209769>

Grudin, J. (2009). AI and HCI: Two Fields Divided by a Common Focus. AI Magazine, 30(4). <https://doi.org/10.1609/aimag.v30i4.2271>
Harvard University. The history of artificial intelligence by Rockwell Anyoha. URL: <https://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/> accessed september 7, 2021.

McCarty, John. What is Artificial Intelligence? Computer Science Department. (November 12, 2007). Stanford University. URL: <http://jmc.stanford.edu/artificial-intelligence/what-is-ai/index.html> accessed september 6, 2021.

Merriam-webster. URL: <https://www.merriam-webster.com/dictionary/robot> accessed September 8, 2021.

Microsoft guidelines for human ai interaction. Microsoft.com. URL:
<https://www.microsoft.com/en-us/research/blog/guidelines-for-human-ai-interaction-design/>

Nejc Rodosek. Jun.25, 2018. Uxdesignn.cc. URL: <https://uxdesignn.cc/with-user-behavior-psychology-to-better-ux-2789f131b142> accessed 8.September, 2021.

Norman, D (1990). The problem of automation: Inappropriate feedback and interaction, not over-automation. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, Vol. 327, No. 1241, Human Factors in Hazardous Situations (Apr. 12, 1990), pp. 585-593 (9 pages)
https://www.jstor.org/stable/55330?seq=9#metadata_info_tab_contents

Norman, D. (2013). The Design of Everyday Things. Basic Books.
URL:https://www.sunyoungkim.org/class/old/hci_f18/pdf/The-Design-of-Everyday-Things-Revised-and-Expanded-Edition.pdf accessed September 7, 2021.

PICKR.AI URL: <https://www.pickr.ai/> accessed September 6, 2021.

Robots.ieee. What is a Robot? IEEE.org. URL: <https://robots.ieee.org/learn/what-is-a-robot/> accessed September 6, 2021.

The origin of the word "Robot". URL:

<https://www.sciencefriday.com/segments/the-origin-of-the-word-robot/> accessed September 6, 2021.

Universal Design. What is universal design? Universal Design.ie. URL:

<http://universaldesign.ie/What-is-Universal-Design/> accessed september 8, 2021.