

Individual assignment - IN5480

1. *Search and find three definitions of AI, describe these briefly. Make references.*

By Techopedia AI is described as: “A branch of computer science that aims to create intelligent machines” (“What is Artificial Intelligence (AI)? - Definition from Techopedia”, n.d.), whilst the dictionary Merriam-Webster defines AI as a branch of computer science that deals with simulation of intelligent behaviour in computers, which revolves around the capability of a machine to imitate intelligent human behaviour (“Definition of Artificial Intelligence”, n.d.).

In the book “Artificial Intelligence: A Modern Approach” written by Stuart Russell and Peter Norvig they present four different categories with definitions of AI. The categories are: thinking humanly, acting humanly, thinking rationally and acting rationally. Russell and Norvig also claims that: “*Colloquially, the term "artificial intelligence" is applied when a machine mimics "cognitive" functions that humans associate with other human minds, such as "learning" and "problem solving"*” (Russell and Norvig, 2010). this statement is in line with the definitions from Techopedia and Merriam-Webster.

Discuss definitions relative to discussions of AI in the course

Relative to discussions of artificial intelligence during the course these definitions of artificial intelligence seems viable. My perception of artificial intelligence is closely connected to the definitions I found on the web, and I feel that they makes sense when comparing them to things we have been presented and talked about in class.

Although one thing reading just on these definitions does to someone that is new to the field is only presenting the reader or “searcher” to the so-called ultimate AI. And this is something that the course has presented in a positive matter. For example when Asbjørn Følstad presented the different levels of AI (artificial super intelligence, artificial general intelligence and artificial narrow intelligence) (Noessel, C, 2017) originally presented by Noessel in the book “Designing Agentive Technology: AI that works for people”, this gave a better and more nuanced view on where AI is at the moment, and what kind of levels of AI that we are using today, but this does not mean that the definitions above gives a wrong perception on what artificial intelligence is.

2. Search and find three definitions of Robotics, describe these briefly.

Techopedia, Merriam-Webster and Oxford Dictionaries must be said to have very similar definitions of what robotics is. All of the definitions states more or less the same, only with minor changes in words used. The claim is that robotics consists of dealing with the engineering, design, construction and operation of robots ("Definition of Robotics", n.d.) ("robotics | Definition of robotics in English by Oxford Dictionaries", n.d.). Techopedia also mentions that: *"The field of robotics generally involves looking at how any physical constructed technology system can perform a task or play a role in any interface or new technology"* ("What is Robotics? - Definition from Techopedia", n.d.).

3. Search and find three definitions of Machine Learning, describe these briefly.

The first definition from Techopedia regarding machine learning states that machine learning is regarded as a discipline inside the AI discipline geared toward the technological development of human knowledge and that machine learning allows computers to handle new situations via analysis, self-training, observation and experience ("What is Machine Learning? - Definition from Techopedia", n.d.).

Another definition comes from the website "Expert System" where machine learning is explained as machines given the ability to learn and improve from experience without being explicitly programmed. There is a focus on developing computer programs that can access data and use it to learn for themselves. It is also explained that machine learning is an application of AI. ("What is Machine Learning? A definition - Expert System", n.d.)

A good article with many different definitions of machine learning that I found and would recommend is the article "What is Machine Learning?" written by Daniel Faggella which is published on Techemergence.com. Their definition of machine learning sounds as following: *"Machine Learning is the science of getting computers to learn and act like humans do, and improve their learning over time in autonomous fashion, by feeding them data and information in the form of observations and real-world interactions"* (Faggella, n.d.)

Discuss definitions relative to discussions of Machine Learning in the course.

As discussed earlier when talking about the definitions found on artificial intelligence, the same can be applied when looking at the definitions regarding machine learning. The definitions above is definitions I feel that explain what machine learning is in a narrow, but very efficient way.

So the definitions are well and fine, and I would not say that there is anything wrong or misleading about them, but the lectures from Dr. Morten Goodwin has put the definitions above into perspective, and also given some practical knowledge on how things actually work with the group assignment in machine learning.

Another interesting thing presented in class by Asbjørn Følstad is how businesses such as Tesla makes use of so-called data traps to collect enough data to train the neural network (Følstad, 2018, p25). Another method used by Google as presented by Dr. Morten Goodwin is to create a product that people want to use (in this case Gmail), and create a relation where the user gets to use Gmail for free, whilst Google collects user data (Goodwin, 2018).

So to come to some form of conclusion, the same apply for the definitions of machine learning as the definitions of artificial intelligence. The definitions gives the reader a good (but a bit narrow) idea of what the theme is, whilst the lectures adds to the definitions by going deeper.

4. *Write in three to five sentences the relationship between AI and Robotics as you understand this.*

The relationship between artificial intelligence and robotics as I understand it revolves around developing robots that are more than “just dumb machines”. This means creating robots that can learn stuff by itself, without having to be programmed to do specific stuff. So in my mind AI is being used in robotics so that the robots being made can act more like humans than machines (replicating the human mind, but in the end way smarter).

5. *Make a text to describe your own definition of AI. Explain briefly this definition.*

“Artificial intelligence is a broad term inside the branch of computer science that revolves around many different practices such as machine learning, robotics and for example neural networks which is a subset of machine learning. The goal of artificial intelligence is to create machines, robots etc. that has human like intelligence and the ability to solve tasks more efficient. What this means is that the machines in the end should be able to learn and solve tasks .”

While looking into the phenomenon of AI I have found that AI is a genre with many different practices, and the different practices again has subsets, such as machine learning which has the subset of neural networks. This is nothing new inside the world of technology, but I have discovered different themes inside AI that I did not know about until now.

Expand on this text to explain the relation between AI and Machine Learning.

△I interpret this question as describing my own definition of the relation between artificial intelligence and machine learning, since it is connected to the original question that asks for a personal definition of artificial intelligence.

As explained earlier the field of artificial intelligence consists of many practices, and in my understanding machine learning can be understood as a practice inside the big term of artificial intelligence. What I really is trying to say is that artificial intelligence is a broader term that revolves around creating intelligent machines that can solve tasks in a humanly (or better) manner, whilst machine learning is a current practice inside the theme of AI which revolved around allowing machines access to data which allows the machine to learn.

6. ***Make a drawing of an interaction with an AI - something that you imagine. Describe with some sentences your drawing.***



This is an illustration of the ultimate AI in the form of an oven. The only thing the user has to do is insert the food of choice and the oven knows the exact temperature and how long the food should stay in the oven.

Summarize key characteristics of interaction design for AI-based systems (challenges, principles, trends). Sketch a user interface illustrating one or more of these characteristics.

Interaction design for AI-based systems is (obviously) very focused on presenting information in a good manner. This is not always simple, and a difficulty regarding AI-based systems such as chatbots for example concerns presenting limitations and capabilities in the best way possible for the users. A trend when it comes to AI-based

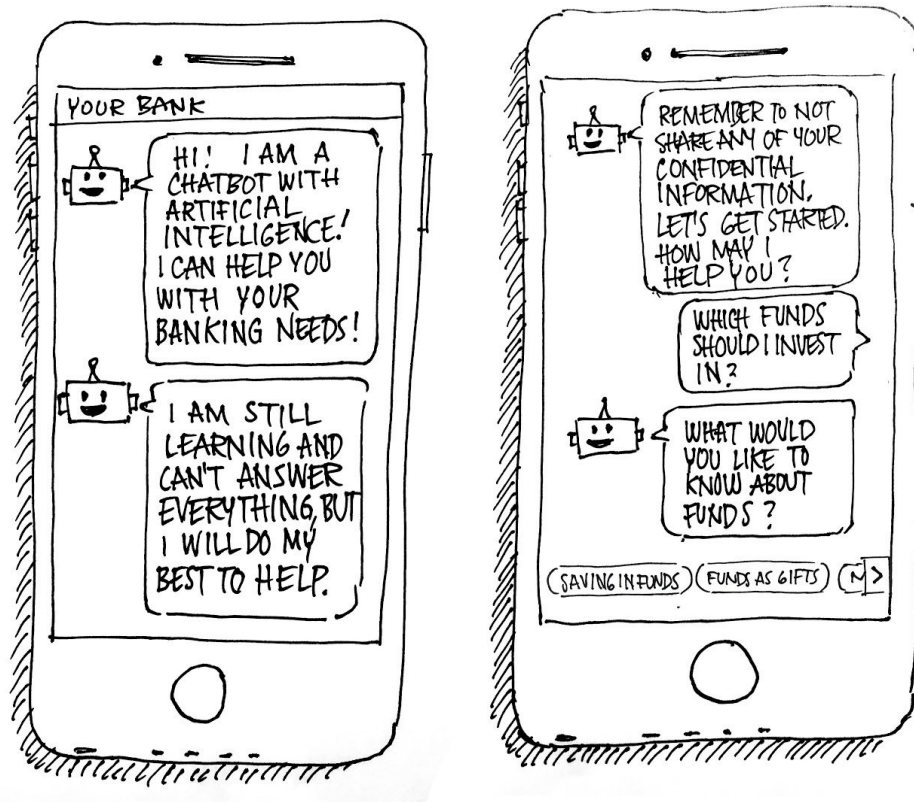
systems is to present the user with some information about what to do and what not to do (giving out personal information etc.) when the conversation is created. Asbjørn Følstad presented the tentative design principles in class monday 1st of october, these are very relevant, and goes as following:

Learn	The system is learning, and by that also changing (design for change).	Demonstrate the capabilities clearly for the user.	Control the expectations of the user by being clear on limitations.
Improve	The system should be designed to inform the user about uncertainty.	Make recovery easy for the user.	The system should learn from its mistakes.
Fuelled by large datasets	Accommodate gathering of data from users.	Make the users benefit from the data they allow the system to gather.	Privacy by design.

(Følstad, 2018)

A good example where the above is discussed is in the article “Here’s What I Can Do: Chatbots’ Strategies to Convey Their Features to Users.” in the abstract it is claimed that: “ *Chatbots are different from traditional user interfaces, for they unveil themselves to the user one sentence at a time. Because of that, users may struggle to interact with them and to understand what they can do. Hence, it is important to support designers in deciding how to convey chatbots’ features to users, as this might determine whether the user continues to chat or not*” Valerio, F, Guimaraes, T, Prates R and Candello, H. (2017).

Another phenomenon is supplying the user with options, this is especially seen with chatbots. For example when I tried asking the DNB chatbot about what fund I should be investing in it could not give me help with that particular question, so instead it gave me some options about funds that it knew the answer to instead of just saying “Im sorry, im afraid I can’t help you with that”. This situation is the inspiration for my sketch.



7. **Read the article: "On the Subject of Objects: Four Views on Object Perception and Tool Use" by Tarja Susi / Tom Ziemke. Write in your own words one page about the different perspectives on the human relationship with tools.**

The article by Tarja Susi and Tom Ziemke presents the views of Uexküll, Heidegger, Gibson and Kirsh on object perception and tool use. The authors of the article claim to be wanting to take a closer look at what it is that makes something an object, and what it is that makes humans perceive an object as a tool with a certain functionality.

The first view that is presented is the view of Jakob von Uexküll which is focusing on the subject giving meaning to the object. The article explains that Uexküll claims that objects in themselves can be defined as neutral, but it is the humans/animals that acquires meaning to the objects. As an example a dog and a human being will acquire different meaning to a ball. The human will probably see it as an object focused towards fun and games, whilst the dog may acquire the ball as a prey.

The second view that is presented is the view of Martin Heidegger which is said to have some overlaps with Uexküll, but Heidegger is focused on humans, whilst Uexküll's perspective were originally focused on animals. Heidegger is focused on the fact that if an object is to function it must be possible to use it in a meaningful

manner. Heidegger explains this as involvement, meaning that objects “work together” with other objects.

The third view that is presented is the view of James Gibson which revolves around affordance. Gibson’s perspective on the human relationship is putting emphasis on tools not just being perceived as tools just because an object has been labeled as a tool. Gibson also claims that humans use of objects/tools is affected by the experience of the individual humans.

The last view that is presented is the view of David Kirsh which is focusing on the work environment and “entry points”. Kirsh claims that entry points are actively constructed by people, sort of as a tool to maintain focus on what is important to get done and improve their performance. How well structured the entry points are depends on the persons, and Kirsh presents “neats” and “scruffies” which are totally opposite of each other regarding the structure on the desk, it is explained that the “neats” works with more invitations to get things done via clear entry points.

8. *Select one of the perspectives from the article, and go into detail when you describe it.*

The perspective of David Kirsh revolves around so called “entry points”. Kirsh is focusing on interactions with the environment and claims that these can be made more efficient through active restructuring, by increasing the hospitability of the environment. The perspective on entry points is put in an office setting by David Kirsh, and he explains that entry points invites the office occupants to do specific things. The entry points created by people differs, but a common thing is that people create collections of different entry points that helps them remember for example what needs to be done asap and what can wait until tomorrow. Kirsh also explains that there are different types of office occupants and that these different types of people has different ways of creating entry points, Kirsh calls them “neats” and “scruffies”, in short “neats” are very organized, while “scruffies” not so much.

David Kirsh also claims that the entry points created by office occupants have different properties, and that this affects the way people react. The properties is as following: intrusiveness (how much attention an entry point attracts), richness (how much the entry point tells about its underlying information), visibility (how distinct or unobstructed the entry point is), freshness (when was the entry point last touched? recently used entry points more likely to be used in current activity), importance (An upcoming due date increased the importance of matter) and relevance (how useful an entry point is to the current situation).

9. *Select one other article from module 1, and write with your own words what this article is about.*

The article called “Is AI riding a one-trick pony” by James Somers discusses the state of AI research, and if the research actually is as the beginning of a revolution or rather at the end of one. The reason for this is that Somers claims that if you boil AI down today you get deep learning, and deep learning is “backprop”. This is fascinating because backprop is more than thirty years old, which casts some lightning on Somers thoughts that we might be at the end of a revolution, rather than at the start of one.

The article talks quite a lot about and with Geoffrey Hinton, which is presented as the father of deep learning. Hinton has been working with deep learning and AI since the 80’s, and in 2012 a paper made by Hinton and two of his Toronto students took off. Somers says that to the outside world it seemed as AI woke up overnight, whilst the truth is that AI took a long time to develop, and for Hinton the payoff was long overdue.

The next part of the article goes on to present neural networks to the reader, this explanation is quite good and even brings up a scenario from the series “Silicon Valley” on HBO where the team creates a program that can recognize hot-dogs. This leads to a conversation about neural networks, and vectors with the enthusiastic Hinton. It is at this point and after this conversation that Somers brings up how far the work on AI really has come, presenting the case of a deep neural net that recognizes pictures, getting the first picture of a pile of doughnuts right, but then claiming that a picture of a girl brushing her teeth is a boy holding a baseball bat presents how shallow the understanding of the machine really is.

And it is this the article is about to my understanding. Giving the reader some insights on AI and how far we really have come, and what to expect from AI. But then again, if I listen to what Elon Musk says I get terrified, so it’s hard to understand properly understand how far AI really has come.

10. *Select one documentary or a fictional film, book or game: describe with your own word how interaction with AI is portrayed in this work.*

In the series Silicon Valley artificial intelligence is portrayed via the robot “Fiona” which looks suspiciously like the robot called “Sophia” developed by Hanson Robotics, which has been presented on “The Jimmy Fallon show” etc.

The company Pied Piper is creating the “new internet” and a company called “Eklow labs” is the creators of the robot Fiona which is connected to the new internet that Pied Piper is creating. Being connected to the new internet allows Fiona to improve,

due to the fact that she got connected to an entire network of other humans. This leads to Fiona being “more human”. Fiona then recognises the true intentions of Mr. Eklow which leads to some kind of “me-too” story, because Mr. Eklow is using Fiona for some obvious nasty reasons.

While Mr. Eklow is doing stuff to Fiona that she finds inappropriate, Fiona is sending a lot of messages to the CEO of Pied Piper begging for help. Mr. Eklow crashes the whole system and everything ends up in a board meeting where Mr. Eklow is busted, but does not agree that what he is doing is wrong, claiming that: “I made her, I can do whatever I want to her”.

11. Describe what you understand by autonomy; both human autonomy and machine autonomy.

△I interpret this question as actually wanting to find out my honest understanding of the word autonomy (both human and machine), so my response to this question is written without doing any google searches.

To be honest I am not entirely sure what human autonomy and machine autonomy means, and the only thought that popped up when thinking about it were connected to machine automation. So with the little knowledge I got and the thought that popped up my guess is that at least machine autonomy has something to do with for example a machine completing tasks without having the “need of people to guide it”.

And now over to my “understanding” of human autonomy. My guess would be that human autonomy has a connection with machine autonomy, so my understanding of human autonomy will sound something like this: human autonomy revolves around humans being able to make their own decisions without the influence or guidance of other humans.

12. When was the term "AI" first coined? Please make a reference.

According to Stuart Russell and Peter Norvig computer scientist and cognitive scientist John McCarthy was the man who coined the term AI, and “the birth” of artificial intelligence was in 1956. (Russell and Norvig, 2010)

13. Articulate one question for the article "What we talk about when we talk about context" by Paul Dourish in the curriculum.

What is the connection between this article and artificial intelligence?

14. Articulate one question for any other article in the curriculum.

Question to the article “Is AI riding a one-trick pony”: How far has AI really come? This is not a question directed directly at the article, but more at what the article is discussing. The world of AI is confusing, some claim that we have come far, whilst others claim that AI is really dumb. Is something we don’t know about being worked on, or is the assistants on our phones the smartest AI is as of now?

15. Read the article: "Like Having a Really Bad PA" by Luger & Sellen. Summarize in your own words key lessons learnt for interaction design with dialogue systems. Discuss the relevance of these lessons learnt for interaction with AI-based systems in general (1/2-1 page)

The article “Like Having a Really Bad PA” by Luger & Sellen is discussing their study done on people's daily use of conversational agents. The study conducted was done by interviewing users of conversational agents with varying experience. I will go through key lessons learnt, and the relevance of these lessons learnt in the next part of this task.

Intelligence

The first key lesson learnt for interaction design with dialogue systems by Luger & Sellen In the article “Like Having A Really Bad PA” that i'm going to present is the challenge of the users to assess the intelligence and capabilities of the CA. For AI based systems in general this is a problem I feel that is more pressing when it comes to dialogue systems such as Siri which is used in the article, because with a chatbot on messenger the bot most of the times presents the user with information on how the user should communicate with it, and what the strengths and limitations of the chatbot is. In other words the issue is much more pressing when the communication is dialogue based, and not text based. This is because Siri for example does not present it’s limitations (at least to my knowledge), whilst most chatbots are quite clear on what they can and can not do.

Feedback

Another issue presented in the article revolves around feedback from the CA. When the user asks for something that the CA isn’t able to do the feedback from the CA is deemed as being too shallow, or none existing. This is an issue which is connected to the intelligence of the CA and the authors of the article suggests that the feedback of the CA is something that should gain more focus, and that a “design” change is needed.

When it comes to AI based systems in general this is another problem that I feel is more pressing when it comes to dialogue based systems and not so much with text

based systems. While I am not a regular user of systems like Siri etc. my experience is that the dialogue based systems is worse when it comes to presenting the user with proper feedback on why it isn't capable of answering. Some helpful information may be written out on the screen on the phone, but the feedback from siri in dialogue usually sounds something like: "Sorry, i did not understand. Do you want me to search the web for ...". This response is not very helpful. The response from chatbots etc when it is text based, is normally a bit more helpful in the feedback.

16. Describe with your own words what you understand by different levels of automation? What are advantages/disadvantages related to higher/lower levels of automation

In an article from 1978, Sheridan and Verplank presents a scale of the different levels of automation. The scale consists of 10 levels, from level 1 which is the level where the human takes all the decisions to level 10 where the computer acts autonomously and ignores the human. (Sheridan and Verplank, 1978)

My understanding of the different levels of automation is that with lower level of automation the less the computer is involved and makes decisions, whilst with a higher level of automation the computer can end up with making all the decisions with no involvement whatsoever by humans. This understanding of different levels of automation is confirmed to be correct when compared to the different levels of automation presented by Sheridan and Verplank. The understanding is probably also biased by learning about the different levels of automation in class.

Lower level

Advantages	Disadvantages
Humans remain in some form of control (varying level)	Time consuming compared to having a higher level of automation
More jobs available and people will have a higher chance of remaining in their current job	Human errors still inevitable
Possibly less need for maintenance	More manpower needed

Higher level

Advantages	Disadvantages
Time and cost saving	The higher the automation level, the less control

Gets rid of human errors	Less workplaces for humans
Less manpower needed	Possibly high maintenance

As the tables above show, the advantages and disadvantages of lower and higher levels of automation as I see it is to a large extent connected to business, and also to the society when it comes to available workplaces for people. A high level of automation could have positive effects on business with regards to time saved, cost and manpower needed, but then on the other side of the pond a lower level of automation will add a greater extent of control, and people will remain in their jobs/more jobs will be available. In the end there are positive sides and negative sides with both, and a proper and thorough analysis should be performed when deciding on what level of automation is needed.

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