Individual Assignment In5480

The Imitation Game, The Language Game, The Learning Game and the Moving Game

Concerning tasks about finding definitions for various terms there is nothing that states that you must explain how you chose your sources so the sources have been selected at random.

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

The online dictionary Meriam-Webster describes Artificial Intelligence as a branch of computer science dealing with the simulation of intelligent behavior in computers.
And goes on further to say the capability of a machine to imitate intelligent human behavior
https://www.merriam-webster.com/dictionary/artificial%20intelligence

A second definition according to Encyclopedia Britannica states the following:"the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings." https://www.britannica.com/technology/artificial-intelligence

The third definition from ScienceDaily® refers to the American scientist John McCarthy who coined the expression back in 1955 stating the following: "the science and engineering of making intelligent machines." https://www.sciencedaily.com/terms/artificial_intelligence.htm

Discuss definitions relative to discussions of AI in the course
According to lecture notes from 27 august 2018 AI is an open and evolving field. If we believe the central premise of the article "Is AI Riding a One-Trick Pony?"by James Somers AI is nowhere near a human intelligence due to the fact that a human can usually recognize and understand an object once it has been explained to them just one time. In order to train a deap-learning system to recognize an object the deap-learning system could need to be shown the object several milion times
https://www.technologyreview.com/s/608911/is-ai-riding-a-one-trick-pony/, seen 18.10.2018
AI is a confusing concept for a lot of people and various articles have different ways of describing the term. One definition proposed in the lecture notes from the course is that AI is a computer systems learning and improving on the basis of large data sources which could be sorted into large data sets.
In my opinion this is one of the best definitions of AI so far as we are currently not certain what uses AI might have further down the road. However data sets will have to play an important role in any development of AI but how they are used is still an open question.

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

The first definition of Robotics is from Serious Science (Non-profit non-governmental project) who interviewed the robotics expert Mel Siegel, a professor at Carnegie Mellon University.
When asked the question about robotics he answered: “There are many definitions of a “robot”. The classical definition among my colleagues is “a robot is a machine that senses, thinks, and acts”. He personally added communicates to this term.

The second definition is taken from the online resource Whatis? Stating that Robotics is a branch of engineering that involves the conception, design, manufacture, and operation of robots. This field overlaps with electronics, computer science,artificial intelligence, mechatronics, nanotechnology and bio engineering.https://whatis.techtarget.com/

The third definition according to the dutch foundation LEO, Center for Service Robotics they refer to I American physicist, engineer and entrepreneur Joseph Engelberger who states “I can't define a robot, but I know one when I see one."

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

First definition according to Techemergence.com : The article arrives at this definition based on a definition by various researchers in the field:
*“*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”

https://www.techemergence.com/what-is-machine-learning/

The second definition: According to Arthur Samuel an American electrical engineer and pioneer within AI coined the expression in 1959 stating : “Machine learning is a field of computer science that uses statistical techniques to give computer systems the ability to "learn" (e.g., progressively improve performance on a specific task) with data, without being explicitly programmed”

Samuel, Arthur (1959). "Some Studies in Machine Learning Using the Game of Checkers". IBM Journal of Research and Development. 3 (3): 210–229.

Third definition:
According to the online resource expertsystem.com “Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.”

Alt source: https://www.recordedfuture.com/machine-learning-definition/ don’t give their own definition

Discuss definitions relative to discussions of Machine Learning in the course

According to Asbjørn Følstad lecture notes AI has had an incredible progress due to machine learning
https://www.uio.no/studier/emner/matnat/ifi/IN5480/h18/undervisningsmateriale/interacting-with-ai---module-2---session-1---v02.pdf

In my opinion Morten Goodwin explains how machine learning makes use of neural networks.

https://www.uio.no/studier/emner/matnat/ifi/IN5480/h18/undervisningsmateriale/presentation_uio_16_9_part2.pdf

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

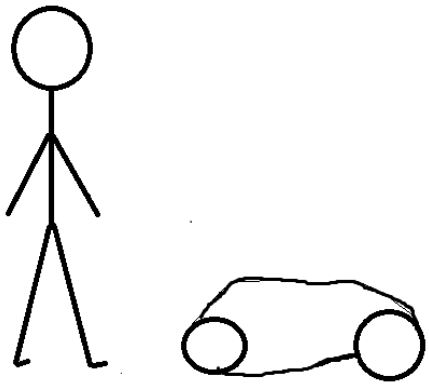
The confusion arises for most people due to the fact that the term artificial intelligence is often used when talking about Robotics and AI. However so far robots are still programmed to solve tasks and not able to think and learn for themselves, while AI has the goal to be an extension to the human thinking and problem solving where humans fail and make error.

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

Based on articles I have read my general impression is that AI is a method and tool to help people in research field and other fields where our own limitations start to appear for example in processing, analyzing, recognizing patterns in large data sets where we fail to see them and from these results provide solutions.

Expand on this text to explain the relation between AI and Machine Learning.
Based on Forbes definition is that Artificial Intelligence is the broader concept of machines being able to carry out tasks in a way that we would consider "smart". The article also poiints out that these terms are bing used interchangeably which os probably why it is a challenge to find a precise definiton of machine learning.
https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/#7125ce12742b

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



The image illustrated above depicts a person who has just programmed his robotic lawn mower and is ready to put it in to action. The subject is excited to see how the object will work.

Summarize key characteristics of interaction design for AI-based systems (challenges, principles, trends).

According to Asbjørn Følstad's article Interaction with AI – module 2 Session 2
the key characteristics are making a system that continuously learn, evolve and improves itself based on large data sets, have an intuitive user interface and help users solve problems.

https://www.uio.no/studier/emner/matnat/ifi/IN5480/h18/undervisningsmateriale/interacting-with-ai---module-2---session-2---v03.pdf

Challenges often arise when it comes to dealing with sensitive data and how to safeguard them. The new data regulative GDPR (Genmeral Data Protection Regulation) which was introduced earlier this year(2018) is a partial attempt to protect consumer data. Trends within this field is making the AI-based systems more user friendly within more and more fields.

Sketch a user interface illustrating one or more of these characteristics.

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 takes on the relationship between an agent and its environment. Four different concepts are being introduced namely **functional tone** (von Uexküll), **equipment** (Heidegger), **affordance** (Gibson), and **entry point** (Kirsh) to describe the aspects of the relationships between subject and object. The foru terms when taken a closer look at have both similarities and important differences. The article central focus point is at some of the theories on the relation between subject and object and more specific artifacts and tools. As mentioned earlier the main focus of the article is on the subject-object relationship and to understand the artefacts and their use the article emphasize on the relation between subject and object and the way see objects in our surroundings. as something we can use to our advantage or as a tool to help us.

One of the challenges is that the terms artefacts and tools have often been used at random and never been tied to coherent or unified definitions. One reason may be different perspectives among researchers and issues concerning context dependency.

Von Uexküll a Swedish-German philanthropist considers the role of the body when researching the relationship between subjects and their objects. A central point in his work is the idea of that each animal ascribes meaning to the physical objects it encounters, and thereby fits the world to itself, constructing its own subjective universe. He divides it into Umvelt: a subject's perceptual world (Merkwelt, everything that the subject perceives and his effector world (Wirkwelt, everything it does).

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

I chose Gibsons view with a more detailed in depth analysis of his perspective: Gibson places his affordances in the physical environment. The term Affordance is what the environment offers the individual. He did not believe that was a mental or psychological link between mind and body. Instead the perception is a direct process with no "middleman". So each animal has its own niche in the environment, which is considered to consist of a set of affordances or as Gibson original statement says: "the af ordance of anything is a specific combination of the properties of its substance and its surfaces taken with reference to an animal." The subject-object is not important to Gibson but mutual relationship between animal and the environment. By saying 360 degrees he means to say that communication comes from all angels, nothing is space and not through a traditional channel

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

I chose the article by Tom Ziemke(2007) "On the role of emotion in biological and robotic autonomy" The essence of the article sums up what the role of the robot in our evolving society might become. Should we be concerned that one day we have made robots that have become so intelligent that they will be self aware and surpass us in some areas but it depends on what areas.

Will robots be a replacement of the shortcomings of us as individuals, or will they replace us entirely which could be seen as a genuine threat.

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.

I chose the 1984 science fiction motion picture Terminator as a natural transition from the previous questions and also because it is one of my favorite movies. The story addresses one of the dangers when robots have advanced so much in its autonomy both biologically and when it comes to intelligence that it is on its way to surpassing humans in every way. The interaction between humans and the AI is not in the normal sense that it is useful and helpful but rather a physical threat to the humans. They must avoid interaction or any form of contact with these AI robots in order to survive. The plot depicts the extreme version of an interaction with the AI where it has instead become hostile

11 Describe what you understand by autonomy; both human autonomy and machine autonomy. Human autonomy is more dynamic and natural in its movements, where we have the full range of movements and our unique way of walking, while robots move statically and slower, but where the movements are also repetitive and more precise.

12. When was the term "AI" first coined? Please make a reference. The term artificial intelligence was first coined by John McCarthy in 1956

Source: https://courses.cs.washington.edu/courses/csep590/06au/projects/history-ai.pdf

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

How is context a central issue for Human interaction design and for interactive systems more broadly?

14.Articulate one question for any other article in the curriculum. In the article by Tom Ziemke “On the role of emotion in biological and robotic autonomy”, 2007

I pose the question. What will the role of the robot be in the future?

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 highlights the problem of using Conversational Agents due to the fact that the users have not been involved sufficiently for valuable feedback in the development process. This paper reports the findings of semi-structured interviews with 14 users of CAs to attempt to understand the current interactional factors in every day use. The results of the interviews showed that there is a huge gap between user expectations and how the CA systems operate.

More and more conversational agents appear on the market without much HCI research being done in terms of their practical use

All the participants experienced that their expectations of how to interact with CA and its capabilities did not live up to reality. The results also showed that the more technical users were able to comprehend the more advanced and sophisticated functionality thus having a better user experience. The users also should be more prepared to deal with limitations and failures before they occur in the CA. Also the goal of the system needs to be more precisely defined. Based on the feedback from the interviews it seems that the in which the system interacts, handles tasks and delivers information does not match the users needs and more thought should be given to design The possible limitations to the study are that it was only conducted in the UK with male participants. Also the numbers of participants were quite small.

The CA's discussed in the interviews were 'hands free' but in reality this was not the case due to large amount of system errors. This is also a design issue. One of the main reccomendations being made was sis to rethink the way system feedback is made and design the CA's to better match user expectations and needs in everyday life.

16. Describe with your own words what you understand by different levels of automation? What are the advantages/disadvantages related to higher/lower levels of automation? (1/2 – 1 page).

As mentioned in the lecture on levels of automation with A. Karahasanovic I will start out with what Sheridan and Verplank's ten levels of automation. There is a gradual process where the computer takes a stronger role the higher up the scale (from one to ten) it progresses. On the first level humans do all the decision making. On level two the computer gets a slightly more active role, but humans are still in control. Basically the humans do all the decision making until step six. After that the computer takes over more and more but informs the human of its actions. Its only when we get to level nine and ten that the level of automation starts becoming a problem for humans and society at large. The advantages of gradually automating tasks is that you can test how much of a routine task can be left to the machine and when the human needs to get involved. Another upside is that the computer will in time with more and more training do these tasks faster, more accurately and more precisely than humans. However it could pose a serious problem to leave the system completely to its own devices because the decisions will get more and more complex and the actions might not be what the humans want.

On level nine the computer presents us the action so the humans still have control over the actions at this point. However these actions might be dangerous or very problematic depending on how thorough and accurate the machine learning of the system has been been and levels of deep learning and quality assurance of the data and pattern learning has been done. That is to say already on step one the human has to carefully consider which tasks it tells the computer to do and what the implications of these tasks entail further up the scale. The last level is where all the tasks are automated and the humans have no say in what happens and is not being informed by the computer about what actions have been taken.

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