Individual assignment 1 - Johnny Lam

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

Intelligence is an important matter for us, humans, intelligence is one of the factors that differentiate us from other animals. The field of artificial intelligence tries to develop a human-made intelligence, which can replicate many of the functionality that the human brain can do. One of the main points is that the field of AI does not only understand the mind, such as a psychologist, but the field also build intelligent entities. The current state of AI has many subfields, ranging from learning and perception to specific tasks such as winning a game of Chess or Go, driving a card and diagnosing diseases. (Russell, 2016)

Artificial intelligence as an attempt to design an intelligent agent. The agent is most of the time design to act in a specific environment, to improve that environment.

Artificial intelligence can also be seen as synthetic intelligence since it is not mad natural, but it is human-made. Synthetic intelligence can be compared to how some pearls can be synthetic and does not mean that it is not a real pearl. (Poole, 1998)

"AI is the simulation of human intelligence process by machines."(techtarget.com, 2018). The important keyword in this definition is processed. The process can include different kinds of functions such as learning, perception, reasoning, and self-correction. Taken from the field of psychology the intelligence process can be compared to information processing, information processing is a way to describe the mental processing of how the brain and mind work (Alleydog.com, 2018). Many of the mental processes are already implemented in a modern personal computer, such as short-term memory, long-term memory. AI an attempt to further develop a more realistic human brain, in such a way that the processing of information is handled intelligently.

The discussion relative to the course explains the term AI as more of an umbrella term, where the definitions over can be on of the answers. Term AI overlaps with other terms such as machine learning and deep learning, because of the overlap it makes it harder to clearly define the term, without mentioning machine learning or deep learning.

Take directly from the course lecture one can divide AI into three types, which are artificial super intelligent, artificial general intelligence and artificial narrow intelligence. One of the

interesting parts is the super intelligent definision since this is usually what media and our pop culture are referring to, when they talk about AI. In fact, super intelligence is not something that is currently used. General intelligence exists, but it little used, on the other hand narrow intelligent is what AI is for the most part used today. General intelligence is build thought the usage of machine learning and deep learning. By using these teqniques, one can make services such as chatbot, computer vision based categorysations. One can say that AI is for the most part currentlly only used for spesific arenas and tasks. It is still a far way to go before we can get a high quality general inteligence, and little to say that super intelligence is even futher away.

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

Robotics is a discipline with root from engineering and science. Robotics attempt to substitute parts of human functions with a machine, such as cognition, walking, sensory, speech and other things humans can currently do. The technology can be used for a different purpose, as simple as optimize and increase the efficiency of a simple human task, to an operation to detect minefields and other high-risk jobs. (Wikipedia)

According to Russell(2016), robotics are robots that are a further development of intelligent agents that can manipulate physical objects, and therefore partly replace human tasks. It is important for robotics to be able to perceive the world through different sensors, in such a way that robots can interact with the physical world. Robotics perception is related to common decision making on how the robot will move, it is similar to the human motor system that decide how and which movements on will take. For the robotics motor system, the function will be task include localization, mapping and object recognition. (p. 1010)

Robotics is a branch in technology that makes an improvement on design, construction, operation, and another usage if the robot (Oxforddictionaries, 2018). It is, in other words, a big field, but is mainly focused on all the different application of robots.

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

Machine learning's one main task is to extract useful information from an observed or collected data, but machine learning also focuses on how to develop modeling techniques (Kononenko, 2017). Kononenko explains machine learning through the ussag of algorithms used for data mining, and explains that machine learning is a subfield of artificial

intelligence (p. 1). The use of machine learning is applicable for many different fields such as industry, medicine, economics, natural and technical science and many other.

The field of machine learning is a field with roots from computer science. Machine learning uses mathematical and statistical techniques. One wants to give computer software a way to learn through the different data input, without a programmer coding how each and every output should be (Wikipedia).

 "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." (Techemergence, 2018)

Machine learning (ML) is a field that use code to solve a problem, where the solution is an algorithm. What makes ML different from other basic algorithm is that ML use the data input to learn up the algorithm in such a way that the algorithm may be better in the next iteration. In the course, we talked about the neural network, which is one of many ML algorithm that is used, but NN is definitely the most popular one. The algorithm takes inspiration from how neurons and synapsis in the brain.

The definition of ML in class is defined by looking at the classification problem, with the usage of NN. One of the problems that may arise by defining ML with classification and also with only with supervised learning (teaching the ML, by telling what is wrong and right), is that we are leaving out unsupervised learning. Unsupervised learning means that the computer learns all on its own, and this will be a important tool to develop deep learning and an artificial super intelligent. Even more important is when we only look at supervised learning, the ML algorithm will be exposed to biases the designer has.

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

AI and Robotics is both a field that in the end wants to simulate human function, where AI focus on human cognition and process, while robotics focus on human motor system movement. If we compare AI and robotics with a normal computer one can say that AI is more like the software, while robotics is the hardware. The case where robotics and AI are used together is we have a robot that has basic human functions.

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

AI is an attempt to simulate parts of the human brain, such as learning, perception, and sensation. The simulated intelligence is a process or a type of machine learning algorithm which can be applied for all sort of field and tasks. The end goal for AI will be to throw AI out in the "wild" and make it learn and do decision on its own according. My definition is described with a cognitive psychology perspective, where the study of the human brain can be applied to computer science and AI. The brain is still a complex subject, but some of the basic function can already be described with current research. What we want to do with AI is to apply these basic human brain function to the world of technology.

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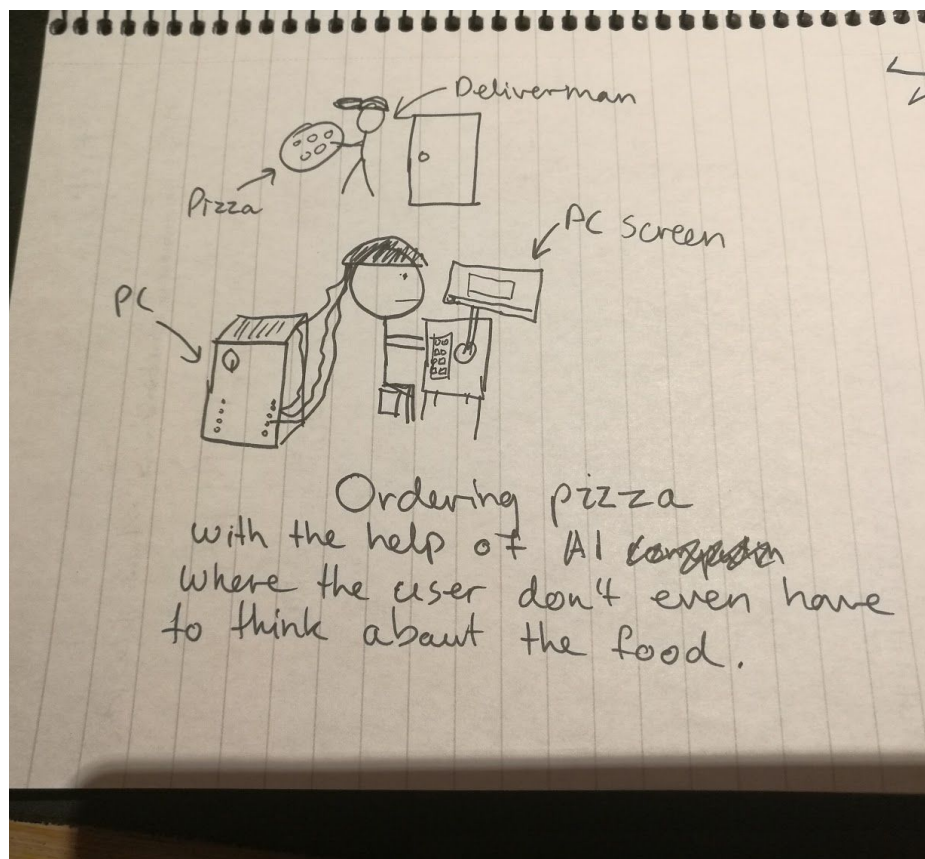

The PC is something can use some sort of brainwave and translate that into human language so that in this case the user can do other things at the same time. One of the hard parts will be for the AI to first understand which thoughts that might be "order pizza", we human can often think on many different things. The principle will

be based on something like voice assistant like today, where the command has to start with a specific phrase. This might be something that can happen in the future if 1. the technology to measure brainwaves gets a lot simpler and less complex, while the measurement of the brainwaves improves the interpreter. The interpreter is still hard to do in practice, because there is much noise, and in this case even harder at home.

The at the first stage the minimum interface it needs is a confirmation box.
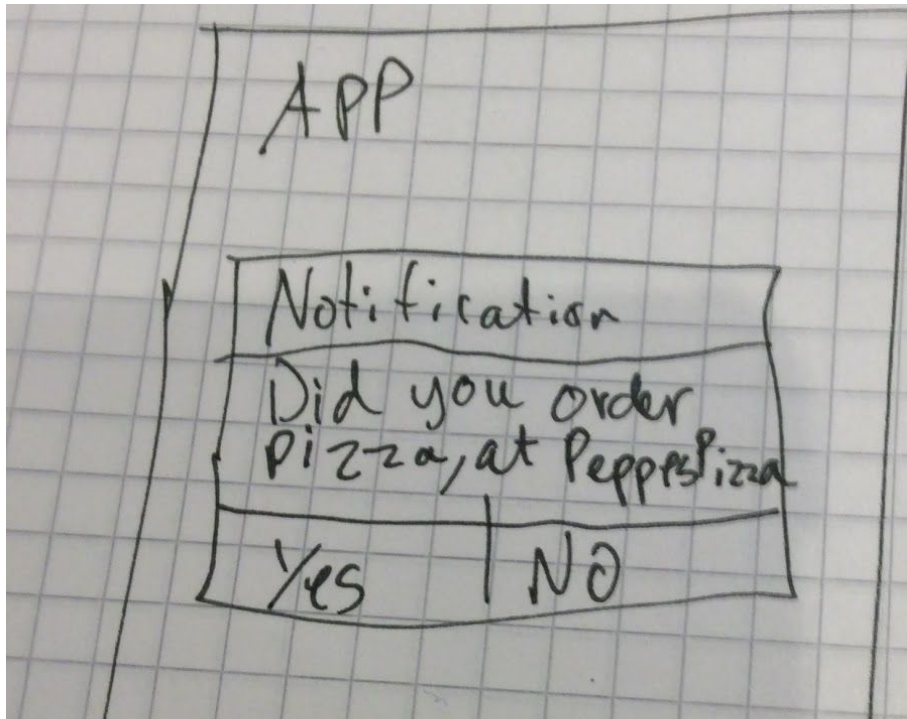
7. Read the article: "On the Subject of Objects: Four Views on Object Perception and Tool Use" by Tarja Susi / Tom Ziemke. Write in your own words one page about the different perspectives on the human relationship with tools.

In this article, the author describes how the relationship between human and agent can be, and also between subject and object. This article presents four different perspectives on human and the usage of tools. The four perspectives are functional tone, equipment, affordance and entry point. Relationships between these perspectives are very similar but have some key differences.

The first perspective is the functional tone, this is a term used for a subjective perspective. This is how the subject sees the situation or object, and also the perspective. It is only the subject can give an object meaning, by past and current experience, this means that the meaning is depended on the subject's state of mind.

The second perspective is "equipment". The article talks about how equipment does not stand isolated, but is also related and has an interaction on its environment. A subject is in a specific place and location and can therefore not be separated from its surroundings. An object is nothing if it does not have interaction a subject, if it does not interact with a subject it will not have a meaning for anything, one can even say that it ease to exist in this world.

The third perspective is affordance. Affordance is about how the environment interacts with a individual. In this case, it is talked about how the environment is objective and exist just to be perceived by a subject. The subject may change the needs, and perception of an object, but the affordance will always be the same.

The last part is on entry point perspective. It focuses on how one makes the use of structure in the environment, to do various tasks. The structure of the environment is the entry point and invites a subject. There is even a less clear distinction if it a subjective or object perspective, since entry point may be on of those.

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

Look at the part about perspective on equipment, in task 7.

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

The article: Cummings, M., 2004. Automation bias in intelligent time critical decision support systems, in: AIAA 1st Intelligent Systems Technical Conference. p. 6313.

The article explains how automation bias is affecting decisions. Automation bias is explained as bias where human sees the decision by computers as the right answer. Automation has different kind of levels, ranging for not doing anything to taking full control and ignores the human. The designer of the AI needs to take into consideration on how human perceive the AI. For critical decision it is important that human does not look at the AI as a system where there are not any errors, it should rather be designed to support human decisions.

The research on automation bias is currently not an empirical, but rather it is evidence on this bias in laboratory settings, because "real world" test will be dangerous and deadly if proven to be true.

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.

Light Novel book: Sword art online
I will describe sword art online, which is a story from a light novel book. In sword art online the characters are living in the future Japan where virtual reality (VR) is a common thing, and there is this game call sword art online. In this VR world, there is an AI called Yui. Yui is a fully function AI, with all of the human characteristics.

Yui is an AI that heavily influence the characters since Yui does have normal human, emotion affects how everyone does decisions. Even when the Yui is only a support character for the story, one can understand that decisions and judgments that are made are influence from Yui. Not only is their influence through emotion, but it is also affected by all the movement and physical decisions that Yui does. AI in this light novel book is not something that is reflected as a bad or evil being, the only evil being here is other humans that have corrupted thoughts. Not even once is the AI showed as a self-centered being, but rather a being that at all times helps and supports its owner. This contradicts some of the modern belief that AI will grow out of control and become something evil such as in popular movies.

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

Autonomy as I understand it is as simple as the ability to make his or her own decisions, without external influence. For the case of human autonomy, it is about how a human can make a decision without the influence or help of other people. The main point is to work automatically without the need for corrections by other people.

Machine autonomy is more or less the same as it is for human, where we want a machine or robot to work independent of a human being, for a given scope. The robot needs to make decisions without the direct influence of human, in such a way that the machine can find out the most effective way to solve a given task.

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

AI was first coined in 1956 by John McCarthy. (McLeod, 2007)

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

Question: Can the term be defined with the help of a cognitive psychology perspective?

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

For the article: Giuliano, V.E., 1982. The Mechanization of Office Work. Scientific American 247, 148–165.
Question: Mechanization and automation have the long been a topic for reduction of cost, and efficiency improvement. At what point is it unethical to automate an office task?

15. a)

The article "Like Having a Really Bad Pa" research on how the usage of Voice Assistant like Google Now, Cortona and Siri. One of the main point I got out of the article is that even the better assistant has a hard time understanding complex human commands. The usage usually starts with a more average command, and when the assistant does not understand the users makes the command even more simple until the assistant understand. It is important to say that many of the users

started with the assistant in the same way, and that is thought Easter eggs, and that made the assistant more fun to use.

The use of AI was and did not get to a point where the user spoke to the assistant as a normal human being, the phrases were still at human to the machine level. For me, the conversation looks like something one would say to a baby that just started to learn a few words. This also means that the user that wanted to use the voice assistant as an important tool, failed to get the desired outcome since the assistant did not always understand.

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).

Automation has multiple levels, and the interaction with the automated system can have different result based on the level of automation. It is important to know what level of automation a system has, to reduce the a type of automation bias that the user has when interaction with a system. From Sheridan and Verplank's automation scale the lowest level of automation is no automation, because humans takes all decisions, and the highest level is when the computer takes full control and ignores the human. Interesting the levels between gives a better description on how systems may be automated today. For instance we have system that is mostly automated, but need human to decide uncertain situasjon. On other side with lower level automated system, computer can gathering information, but categorising the important information will be done by human. By having the lowest level and no automation, means that human has to do many task, and repetitive task, but also means that they have full control. The highest level of automation has advantages and disadvantages quite the opposite to the lowest level, this level can be very efficient for the right system, or a disaster as one may have seen in science fiction stories.

Reference list:

Poole, D. L., Mackworth, A. K., & Goebel, R. (1998). *Computational intelligence: a logical approach* (Vol. 1). New York: Oxford University Press.

Russell, S. J., & Norvig, P. (2016). *Artificial intelligence: a modern approach*. Malaysia; Pearson Education Limited.

Techtarget (2018, August.) *AI (artificial intelligence).* Retrieved 19.september 2018, from https://searchenterpriseai.techtarget.com/definition/AI-Artificial-Intelligence

Information Processing Model. (n.d.). In *Alleydog.com's online glossary*. Retrieved 20. september 2018, from:
https://www.alleydog.com/glossary/definition-cit.php?term=Information+Processing+Model

Wikipedia contributors. (2018, September 19). Robotics. In *Wikipedia, The Free Encyclopedia*. Retrieved 08:16, September 20, 2018, from
https://en.wikipedia.org/w/index.php?title=Robotics&oldid=860266004

Kononenko, I., & Kukar, M. (2007). *Machine learning and data mining*. Horwood Publishing.

Wikipedia contributors. (2018, September 18). Machine learning. In *Wikipedia, The Free Encyclopedia*. Retrieved 09:16, September 20, 2018, from
https://en.wikipedia.org/w/index.php?title=Machine_learning&oldid=860184347

Faggella D. (2018, September 16.) *What is Machine Learning?.* Retrieved 19.september 2018, from
https://www.techemergence.com/what-is-machine-learning/

McLeod, R., & Schell, G. P. (2007). *Management information systems*. USA: Pearson/Prentice Hall.

Cummings, M., 2004. Automation bias in intelligent time critical decision support systems, in: AIAA 1st Intelligent Systems Technical Conference. p. 6313.