IN5480 individual assignment fall 2021

Written by Mari Cathrine Karlsen

Module 1

- Concepts, definitions and history of interaction with AI
- Human Robot Interaction
- Universal Design and Interaction with AI

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

History of AI

The first use of the term AI (Artificial Intelligence), was used in 1956 by a mathematician and logician named John McCarthy (Grudin, 2009). Some people call him the father of AI because of his ideas and thoughts about this field. The same year, McCarthy did a workshop with several researchers from different fields: scientists, psychologists and mathematicians. The result of this was a positive and optimistic group of researchers who seemed curious about his ideas.

Three definitions of AI

> *"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." - (McCarthy, 2007)*

This definition is focusing on the science and machine parts of AI, rather than the human aspect. Back in the 50s, they could not know how quick the future data revolution would develop. Rather not how the human aspect of AI could be so important to protect people's privacy. This definition does not include every part of AI.

> *"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)*

This definition is focusing on both science and human intelligence, and more specifically about how to deal with situations that normally require human intelligence, like social situations or maybe feelings.

> *"An interdisciplinary field, usually regarded as a branch of computer science, dealing with models and systems for the performance of functions generally associated with human intelligence, such as reasoning and learning."*
> *(ISO/IEC 2382-28:1995(En), Information Technology — Vocabulary — Part 28: Artificial Intelligence — Basic Concepts and Expert Systems, n.d.)*

This definition is focusing on both human intelligence and science, but mainly how AI works as a concept and its associations.

My definition

Based on these three definitions, my definition of AI is:

> Artificial Intelligence (AI) are machines using computer science designed to operate like a human being, experience and adapt to new situations, with the ability to learn human behaviors.

This describes both that AI is based on science and that it is designed, but still acts like a human being.

Article about AI

I chose the article "Does AI make PD obsolete? Exploring challenges from Artificial Intelligence to Participatory Design" by Bratteig and Verne.
Bratteig and Verne are concluding that AI challenges PD because of the fact that AI technologies change unpredictably over time, and its behavior. I agree with their conclusion. As they talk about, machine learning (ML) systems do learn from people's actions and present it in a complex way. It can be difficult for a designer to know what they are making if the technology is complicated and complex.

Company that works with AI

Google AI

Google is presenting AI both as an idea and also as a product. They have a webpage "www.ai.google" that describes how Google is working and developing products to ensure that everyone can access AI. Furthermore, they explain how AI is affecting their products in a positive way, and also how it helps to solve big and small problems for people all over the world. Google does not present any disadvantages or dangerous factors around AI and human interaction directly. Even though they don´t talk about the danger behind it, the page is referring to the responsibilities that come along with developing artificial intelligence. To empathize with these responsibilities they made a principle guide to show how they include AI and what kind of applications they will not pursue making

Documentary or fictional film, book or game

The Paro is a robot seal made for different groups of people to help them feel less alone. Especially for old people with alzeimers or young people at the hospital who have cancer or even autism. The goal is to make them feel less alone, reduce stress, and help people in a therapeutic way. Paro can also learn to behave in a way that the user prefers.

1.2 Robots and AI systems

Robota

The word "robot" comes from the czech language ("robota") and means slave. The first use of "robot" was in the entertainment industry in 1921 in a live play called R.U.R (by Karel Čapek). The plot in this play was about robots created by humans suddenly became self-aware and attempted to destroy mankind (R.U.R and the Invention of Science Fiction on Stage!, n.d.).

> *"A robot … refers to a physical object that interacts with the physical environment, either on its own or via a person, to accomplish a task." (Schulz, 2020).*

This definition is describing what a robot can do and the interaction it has with either itself or a human being.

> *"Actuated mechanism programmable in two or more axes with a degree of autonomy, moving within its environment, to perform intended tasks" - ISO 8373:2012 (ISO 8373:2012(En), Robots and Robotic Devices — Vocabulary, n.d.)*

This definition is focusing on how a robot works and that the robot has a kind of

The common thing of the two definitions are the description of robots as physical objects doing a task. The ISO definition uses the word "autonomy" which can be confusing if you don´t know these concepts. The explanation from Trenton Schultz is probably more easy to understand for more people, also for people outside of the IT industry.

My definition

Based on the definitions mentioned over, and what I have read, my definition is:

A robot is a physical object programmed with computer science that is able to perform tasks, sense, or use technologies like video, voice control or AI.

Relation between AI and robots

AI is a system, robots are a physical object, both designed with computer science. The common goal is to solve a problem or help someone. A robot can be designed with AI, which will increase the functionality, behaviour and quality of the robot.

Physical robot

Find one contemporary physical robot, either described in a research article - or a commercial robot, and describe how this robot moves and how a human user is interacting and using the robot in a specific situation.

1.3 Universal Design and AI systems

Definition

The definition of Universal design from the National Disability Authority webpage (2020):

"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".

This describes the importance of including all people with all kinds of disabilities, so that everyone can use IT systems, webpages and applications without having trouble or feeling excluded.

AI, humans and universal design

One positive thing about AI is that it can assist medical staff in finding viruses and tracking a certain pattern with the help of AI. AI can also be used in a system by for instance using sign language interpretation or speech synthesis which will include more users. AI chatbots can help people two understand a service or connect to the company in an easy way.

But AI can also be a negative thing, for instance taking over people's jobs because of how smart the system and workplace have become. If systems or webpages are designed in a certain way, they may exclude a group of people or exclude people with disabilities because of the way it is programmed.

WCAG 2.1

The principles of WCAG 2.1 guidelines describe specific elements that are important to think about when designing something. The design and development of systems and applications has to be done by humans, I think. Artificial intelligence does not have the capability to understand the importance of including everybody's needs. As a human being you can understand something, see the consequences, and show respect. An AI machine can only learn from previous situations, and not having the ability to respect everybody's needs in a system.

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