

Concepts, definition and history of interaction with AI

First, write a section about how AI came about, the history of AI!. When, and by whom, was the term first used?

The term AI, or artificial intelligence, was first used in 1956 by John McCarthy, an American logician and mathematician (Grundin: 2009, p. 49). McCarthy used the word to describe machine simulation of learning and other characteristics of human intelligence. The world's first artificially intelligent program is called "Logic Theorist" and was written the same year (Bosch: 2018).

Then, find three different definitions of AI. Describe and explain these three definitions, for example by when it was defined, by whom and in what community. Based on these three definitions, make one definition yourself - and describe and explain your definition.

The first definition of AI that appears on Google when I search for "artificial intelligence" is *"The simulation of human intelligence processes by machines, especially computer systems. These processes include learning, reasoning and self-correction"* (Rouse: 2018).

The Oxford dictionary defines AI as *"the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages"* (Lexico: 2019).

Wikipedia says that AI often is *"used to describe machines (or computers) that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving"*", which is a definition that was used by Stuart Russel and Peter Norvig (both computer scientists) in *"Artificial Intelligence: A Modern Approach"* from 2009 (Wikipedia: 2019).

Rouse defines AI as a type of simulation, the Oxford dictionary defines AI as a theoretical and practical framework behind it, and Russel and Norvig defines AI as a description of a certain type of machines. Both Rouse's and Russel and Norvig's definitions are from around 2009, while the date of Oxford dictionary's definition is hard to pinpoint due to the nature of the

website. The two other definition both have named authors, Russel and Norvig being a logician and mathematician and Rouse being a writer and manager of the online IT encyclopedia WhatIs.com.

My definition of AI is that "AI is the simulation of human cognitive processes in machines". I believe that AI is not truly intelligent, but is able to mimic certain processes by being made in a certain way. I do not believe that you can create something equal to human intelligence, but that algorithms and machine learning may create a something that may resemble it. The machine's intelligence is limited by the developer's choices when developing it, so the intelligence will be subpar to human intelligence.

Find one contemporary company that work with AI and describe how this company present AI on their web pages. In what way does this company talk about AI, as a product, as a service, framework or "idea"?

I wanted to find a Norwegian company that work with AI, so I decided to check the report "Artificial Intelligence in Europe: Norway. Outlook for 2019 and Beyond" commissioned by Microsoft, but only one of the six Norwegian companies mentioned had information about AI on their webpage: Telenor. Telenor calls AI "the most important technology in the 21st century" and predict that AI will be the momentum of all processes and services within the next 20 years. They talk about the effect AI will have on the financial development and stress the importance strengthening Norway's position by educating more people on AI.

Select one documentary or a fictional film, book or game that is about the use of AI systems. Describe with your own word how human interaction with AI is portrayed in this work

In the HBO and BBC series *Years and Years* by Russel T Davies we follow the fictional Lyons family who all consumers of AI technology. The story is set to the period 2019 to 2034, and the technology in the fictive 2019 is about as advanced as it is in the real 2019. All adults in the series (elderly too) have a personal assistant (not unlike Siri, Alexa, etc.), which they use to call each other, note down plans and organize their everyday lives. This type of artificial intelligence is portrayed as something ordinary and common, as it seems like most, if not all, either owns one or knows how to use one. There are several other examples of technologies that are portrayed as niche and uncommon, but personal assistant AIs are not among them.

Towards the end of the series (without spoiling too much), one of the characters are getting their memories downloaded to a new storage technology to become a fully digital human intelligence. In this way, the show blurs the lines between human intelligence and artificial intelligence. In the very last scene of season one, the character's consciousness is supposed to "inhabit" an old personal assistant hardware. In that way, the person can live on as a part of all their lives. The characters debate whether the character really will be conscious, or if the downloaded version only will be a shadow of who the person really was. The issue of whether emotions can or have to be uploaded to fully realize a human intelligence as digital is brought up, but we don't get the answer to that as the show ends before the digital human intelligence is supposed to answer whether or not it is, in fact, there. The show ends on an open note, which leaves the seers to ponder the future of artificial intelligence.

Human Robot Interaction

First, write a section about how the word Robot came about.

The word "robot" is originally Czech (*robota*) and means "forced labour". It was the Czech playwright K. Čapek who coined it as early as 1920 when he called his play "Rossum's Universal Robots" (R.U.R.) (Lexico, 2019). In the play, "robot" is used to describe humanlike machines made by the fictional scientist Rossum. Later in the play, the robots are made more human by a second scientist, and the robots become capable of feeling pain. The robots become more and more humanlike, and in the end the robots come to dominate humans (Kuiper, 2019).

Then, find two different definitions of robot. Describe and explain these definitions. Based on this definitions, make one definition yourself, and describe and explain this definition.

Oxford Dictionary defines the word robot as "A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer" (Lexico: 2019).

This definition is also used by Wikipedia.

The Robot Institute of America, as mentioned in Sebastian Thrun's paper on HRI, defines a robot as "A reprogrammable, multifunctional manipulator designed to move materials, parts, tools, or specialized devices through various programmed motions for the performance of a variety of tasks" (Thrun, 2004).

As mentioned in the task about AI quotes, the dates of definitions by the Oxford dictionary are hard to pinpoint, but the other definition from as early as 1995.

My definition of a robot is that "a robot is a machine able to do complex tasks". It is fairly simple, but I feel like I do not have the right insight to make a more specific definition just yet.

Discuss the relation between AI and Robots. Is "a robot" different from "an AI"? In what ways are they different and similar? Bring in the definitions that you described earlier about robots and AI for this discussion.

While AI is about simulating human intelligence, robots are more about doing complex tasks. AIs may be capable of doing complex tasks, and robots may simulate intelligence, but it is not given that they do that. An AI is often a software able to understand, reason or learn, while robots are physical artefacts able to move around either globally or locally.

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.

The Boston Dynamics robot "Spot" is a semi-autonomous four-legged robot that can be controlled with a controller with a layout that resembles a hybrid between an Xbox controller and a Nintendo Switch. Spot can be steered in all directions, and due to the four cameras placed on either side of Spot, the operator can touch the screen to choose a waypoint that the robot should walk to (The Verge: 2019). Spot also has balance sensors to help with keeping it on all four legs while walking on uneven terrain. The robot resembles the robot from the episode "Metalhead" (episode 5) in season 4 of Black Mirror.

Universal Design and Interaction with AI

Please find and describe a definition of Universal Design. Explain this definition, how you understand what Universal Design is about with respect to inclusion.

The University of Washington state that “Universal design is the process of creating products that are accessible to people with a wide range of abilities, disabilities, and other characteristics”.

Here, the UoW indicates that universal design is not an end state, but the act of making something accessible. The definition implies that the end goal is not to have products that are “universally designed”, but products that are accessible. While one might think that both wordings have a similar meaning, the distinction of

Describe the potential of AI with respect to human perception, human movement and human cognition/emotions. You are encouraged to use examples.

AI is already being used to mimic human movement in so-called “deepfakes”. The deepfake technique is to use AI to make one person’s movement look like a different person’s movements. An example of this is the video “Friends ross Nicholas Cage faceswap piano” by YouTube user 9gag videos” where the faces of



(9gag videos, YouTube).

all the characters of the show “Friends” are switched out with the face of Nicholas Cage. While this can be seen as a trivial and fun thing, it has already been used to fake videos of political leaders. It is already becoming hard to differentiate between real and deepfake videos, so it is plausible that deepfakes can become a real issue in upcoming elections, as well as for people’s personal reputations. The technology can be used to do a lot of harm, such as making fake videos of war declarations, revenge pornography, false official statements, etc. While it is wonderful that technology keeps on evolving and new inventions do exist, it is important to question whether the technology should exist.

Describe the potential of AI for including and excluding people. You are encouraged to use examples.

With the rising focus on voice-controlled AI, hearing-impaired users will be excluded from this handsfree technological experience. Those of us who are heavily hearing-impaired will rely on their eyes or touch to receive the output and touch (i.e. keyboard) or eyes (i.e. eye-tracking) to give input. This makes it harder to multitask when you i.e. are driving a car, making dinner, carrying a lot of grocery bags or in any other way are temporarily busy with your hands. On the other hand, speech-based AI allows for users with strong vision-impairments or missing limbs to interact with technology more freely compared to vision or touch-based technologies like computers, smartphones and smart watches.

There are other AI technologies that allow for use of smartphones while vision impaired. Object recognition apps (either separately downloaded or already integrated in the phone) allows users with reduced sight to “see” through their phone’s camera. The Huawei P30 Pro has an integrated app called HiVision in the camera application that can recognise QR-codes, translate text, scan regular objects and find related products for sale, recognize art pieces, and count calories in food. These apps can help both able-bodied and disabled users to access information without typing. This might be more efficient for some, but for users with rheumatic diseases and lower fine motor skills this might be harder to use. Luckily, most smartphones today support most of these artificial technologies, so each user can choose to download the applications that work for them.

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