

Iteration 1

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

Between philosophic attempts to define intelligence and early evolution of computing, is the cradle of Artificial Intelligence (AI) and the emerging of a new research field. In 1949, New York Times magazine published the following controversial words written by Alan Turing, a mathematician, logician, and at that time - leading codebreaker (Grudin, 2009).

“I do not see why [the computer] should not enter any one of the fields normally covered by the human intellect, and eventually compete on equal terms. I do not think you can even draw the line about sonnets, though the comparison is perhaps a little bit unfair because a sonnet written by a machine will be better appreciated by another machine.”

The term AI was introduced in 1956 by an American mathematician and logician named John McCarthy after a workshop at Dartmouth College, Hanover. The road from there has been winding with its fair share of ups and downs. There's been eras of grand visions and generous funding altering periods with crushed expectations (Grudin, 2009).

In the 1960s, AI grew in the spotlight of the academical world as well as ordinary people and support and fundings rising substantially led to a period of financial independence (Grudin, 2009). Periods were interest as well as fundings where low has been referred to as AI-winters (Hendler, 2008). One famous AI-winter started in 1970s subsequently to an article criticizing the state and lack of progress in the field of AI in UK (Lighthill, 1973).

Definitions of AI

By referring to the following three, amongst the vast variety of definitions of AI, I wish to highlight the pattern related to expectations and perception of the word *intelligence*, starting with John McCarty who coined the term AI. “[...] the science and engineering of making intelligent machines” ... “[where] intelligence is the computational part of the ability to achieve goals in the world” (John McCarthy, 1955)

A more recent definition uses *mimic human intelligence*, which is further from proclaiming that an AI machine possesses human intelligence than McCarthy's definition. Even if that is not clearly outwritten, due to the, at that time cotemporary perception of opportunities related to the intelligence of machines, it's easier to read more into it. "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." (Russel & Norvig 2010)

The last definition is from AI100, an initiative from Stanford University where leading thinkers has been invited to study and investigate influences of AI on people and society. The long-term project includes a wide span of faculties to give a more nuanced perspective. "Artificial intelligence is that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment." (Stone et.al., 2016)

For now, I chose to focus on that definition of intelligence still debated; that a machine, even when possessing intelligence likeworthy a human, is still not a human and thereby not automatically or possible equipped with attributes associated with what is commonly perceived as human intelligence.

Artificial Intelligence is the aim to develop an ability to make non-living organisms able to independently act or make rational decisions as a response to input or interaction.

Facebook and the use of AI

To get insight into Facebook's use of AI you need an active investigating approach and it is not necessarily something ordinary users are presented to or aware of in their everyday use. More easily accessed, at the webpages engineering.fb.com and ai.facebook.com, they do however present their research in the field (2020). "Facebook Artificial Intelligence Research (FAIR) seeks to understand and develop systems with human-level intelligence by advancing the longer-term academic problems surrounding AI. Our research covers theory, algorithms, applications, software infrastructure, and hardware infrastructure across deep learning, computer vision, natural language processing, speech, and reasoning. (Facebook engineering, 2020)". Facebook lifts their contribution and what FAIR brings to the field, while their own

gain from implementing AI is not as equally clear. One could argue that, for Facebook, it's also of essential economical value to understand the needs and patterns of their users.

AI in contemporary movies

The umbrella academy a Netflix series about seven siblings with different superpowers and their strict adoptive father, who when present, mostly concerned with preparing them for saving the world. The caretaking and loving part of their updrawn is handled by an AI android robot the children call "mom". She is embodied as a beautiful woman with a stereotypic housewife look and a kind voice. Her moving pattern is human-like, as well as her ability to express reactions to common emotions by facial expressions. Though it is clear something is missing, and the notion that she is programmed gets present when something unexpected happens. The series explores the inner conflict experienced by the children dealing with emotionally affection for the woman who raised them acting as a loving mother, and their growing notion that she in fact is a robot and thereby not capable to do more than merely mimic this kind of human emotions.

1.2 Robots and AI systems

Etymology: The word *robot* origins from the Slavic from *robotá* for compulsory labour. The modern use of it can be traced back to the 1920s when the Czech author Karel Čapek used it in a play called *Rossumovi Univerzální Roboti - Rossum's Universal Robots* ("Robot", n.d.).

Definitions of Robot

As mentioned in Sebastian Thrun's paper (Thrun, 2004), the following is the Robot Institute of America's definition of a robot: "[...] 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"

The Merry webster dictionary states definition of a robot as "[...] a machine that resembles a living creature in being capable of moving independently (as by walking or rolling on wheels) and performing complex actions (such as grasping and moving objects)" ("Robot", n.d.).

Based on previously stated definitions mine definition is: *A physical embodied technical device that are able to perform tasks based on its capability to compute, sense, and actuate.*

The relation between AI and robots

Even though they are somewhat connected, AI and robot does not define the same thing. In practice, AI is a program, often without a physical embodiment while that often is a criterion for an artifact to be defined as a robot. Robots with embedded artificial intelligence is a bridge connecting the two fields. That functionality is however just one a part of a robotic system constituting a complete robot.

Contemporary physical robots

Milo, a humanoid robot released in 2013 is used for helping children within the autism spectra to practice recognizing emotions and expressing empathy. He can walk, talk, and even model human facial expressions. There is a touchscreen on his chest displaying icons as hi speaks to help the children better understand what he is saying (robots4autism, 2019).

1.3 Universal Design and AI systems

«Universal design» means designing or accommodating the main solution with respect to the physical conditions, including information and communications technology (ICT), such that the general functions of the undertaking can be used by as many people as possible, regardless of disability. (Equality and Anti-Discrimination Act nr 18)

The potential of AI

A lot of research has been done on AI with respect to human perception, human movement and human cognition/emotions. E.g. there are robots like earlier mentioned *Milo*, helping children with autism practise recognizing and expressing emotions.

There is also research being done on how making robots move more like humans by using principles of animation, can help in giving users a better and more genuine experience while interacting with robots (Schulz et al, 2018).

The potential of AI for including and excluding people

Recent years there has been debates on AI and exclusion-related topics, such as racism. Since a machine does not possess the capability to judge right from wrong by its own a lot of responsibility is put on those designing and developing it.

On the positive side lifting what AI has potential to contribute with I the terms of Universal Design, as of today there are already multiple devices out there helping people with different disabilities. Some good examples of this are: text to speech for people who are visually impaired, advanced spelling program helping with dyslexia and how people with aphasia through Speech synthesis.

The Human AI-Interaction guidelines in WCAG 2.1 uses the concept understanding, meaning being able to make sense of given information. When talking AI and machines, I would say that they in a logical aspect are able to understand. The word *understand* could on the other hand also include a more human emphatic perspective which a machine can't have.

1.4 Guidelines for Human-AI interaction

Mitigate social biases is an example of Microsoft guidelines for design interaction with AI. This means making sure that the system does not reinforce some undesirable stereotypes or biases. This is referring to the *during interaction* phase and could in practice mean e.g. not giving an AI artefact a dialect or use of language that work against desirable perception of it.

One famous set of design guidelines for HCI is Donald Norman's six design principles: visibility, feedback, affordance, mapping, constraints and consistency (Norman, 2013).

I would say Microsofts AI guidelines are more direct and divided into different phases which Normans more abstract guidelines is not. They are very similar in the way both are handling themes such as feedback, visibility and that the main focus is design for a userfriendly products.

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