SMARTER THAN HUMANS

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Table des matières

Objectifs

By the end of this lesson, students should be able to:

-define intelligence and related words using synonyms and antonyms

-outline the different advantages and drawbacks of using artificial intelligence

-construct the simple past of verbs

-describe old features of machines

Introduction

Look at these pictures and try to grasp the capacities of modern machines

 STANLEY

Through extensive and rigorous research in the area of robotics, AI researchers have been able to develop a driverless robotic car named STANLEY that sped through the rough terrain of the Mojave Desert at 22 mph, finishing the 132-mile course first to win the 2005 DARPA Grand Challenge. STANLEY is a Volkswagen Touareg outfitted with cameras, radar, and laser rangefinders which equip it to perceive the environment and surrounding, and it also includes onboard software to command the steering, braking, and acceleration.

 WAIMO

Waymo is a self-driving technology company with the mission to make it safe and easy for everyone to get around—without the need for anyone in the driver's seat.

AN APPROACH OF INTELLIGENCE

I

1. AN APPROACH OF INTELLIGENCE

Being *SMART* is being *INTELLIGENT*. Because of our inquisitive nature as humans, through the ages (asking questions about things, wanting to get explanations about life), we have sought to comprehend how we think. We have attempted to know how we perceive things through our sensory organs, how we come to understand things, how we manipulate and so on. Humans, in general, and scientists, in particular, want to master the universe reproducing humans. Machines become like humans and even more intelligent than humans. This is *Artificial Intelligence*. Artificial Intelligence aims at the ability of a machine or a computer program to mimic the activities of the human using (and improving on) given intelligence enabling it to function properly and with foresight in its surroundings. If we can create machines that can react like humans then it means that we understand how nature functions.

The name *Artificial Intelligence* was first used by John McCarthy in 1956 when he held the first academic conference on the subject.

Intelligence is composed of at least nine fields that are:

• *Thinking*

• *Perception* : ability to perceive one's environment

• *Learning* : ability to learn from past experiences

• *Reasoning* : ability to solve problems

• *Communicating* : ability to communicate with other entities

• *Creativity* : exploration, modification, redesign, etc.

• *Autonomy* : ability to set goals and decide on appropriate actions to accomplish the set goals

• *Organization*

• *Decision-making*

AS SMART AS HUMANS

Through Artificial Intelligence, researchers want to reproduce in machines what humans think and how they behave. Through Artificial Intelligence, researchers want to endow machines with the ability to make inference and deduction to arrive at a conclusion based on hypotheses that are true.

Through Artificial Intelligence, scientists want to endow machines with the ability to act like humans: answer questions in a way that machines could be as smart as humans. Humans cannot be differentiated from machines in their ways of acting, of doing things (see the TURING TEST and the TOTAL TURING TEST).

Artificial Intelligence takes into account rationality. A rational machine functions autonomously, perceives or observes its environment, perseveres over a lengthy period, adjusts to change, and creates and hunts goals.

Examples

In Jobs

In 2010, Apple developed SIRI, an intelligent special assistant (secretary). It incorporates voice queries and natural language processing to answer questions, make recommendations and perform various tasks.

In Online Security

VICARIOUS, founded in 2010, uses the computational philosophies of the human brain to build or design software that can think and learn like a human. On October 28, 2013, Vicarious' algorithms reliably cracked modern CAPTCHAs.

In Transportation

In the course of the Persian Gulf crisis of 1991, the United States armies installed a DART (Dynamic Analysis and Replanning Tool) fitted with the task of automating and programming logistics planning and forecasting for transportation.

2. Exercice : Answer the following question choosing from the options

What is intelligence?

O   Intelligence is the ability not to be intelligent.

O   Intelligence is the ability to imitate things.

O   Intelligence is the ability for thinking, reasoning and making decision.

3. Exercice : Fill in the spaces with the fields covered by intelligence

Read the historical approach of intelligence then fill in the spaces with the suitable words about the fields covered by intelligence : reasoning - creativity - autonomy - perception - thinking - communication - learning

1-   = sending messages across

2-   = noticing or understanding something using one of the senses

3-   = gaining knowledge

4-   = acting separately or independently from others

5-   = ability to think of new ideas or make new things

6-   = using the mind to produce ideas

7-   = understand things in a logical way, finding solutions

SMARTER MACHINES

II

1. KASPAROV DEFEATED

I am Garry Kasparov ; the former world chess champion. In 1985, in Hamburg, I played against thirty-two different chess computers at the same time in what is known as a simultaneous *exhibition*. I walked from one machine to the next, making my moves over a period of more than five hours. The four *leading* chess computer manufacturers had sent their top models, including eight named after me from the electronics firm Saitek.

It illustrates the state of computer chess at the time that it didn't come as much of a surprise when I achieved a perfect 32–0 score, winning every game, although there was an uncomfortable moment. At one point I realized that I was *drifting* into trouble in a game against one of the "Kasparov" brand models. If this machine scored a win or even *a draw*, people would be quick to say that I had thrown the game to get PR for the company, so I had to intensify my efforts.

Eventually I found a way to trick the machine with a sacrifice it should have refused. From the human perspective, or at least from my perspective, those were the good old days of man vs. machine chess.

Eleven years later I narrowly defeated the supercomputer Deep Blue in a match. Then, in 1997, IBM redoubled its efforts—and doubled Deep Blue's processing power—and I lost the rematch in an event that made headlines around the world. The result was met with *astonishment* and *grief* by those who took it as a symbol of *mankind*'s submission before the almighty computer. ("The Brain's Last Stand" read the Newsweek headline.) Others shrugged their shoulders, surprised that humans could still compete at all against the enormous calculating power that, by 1997, sat on just about every desk in the first world.

It was the specialists—the chess players and the programmers and the artificial intelligence enthusiasts—who had a more nuanced appreciation of the result. Grandmasters had already begun to see the implications of the existence of machines that could play—if only, at this point, in a select few types of board configurations—with godlike perfection.

The computer chess people were *delighted* with the conquest of one of the earliest and holiest grails of computer science, in many cases matching the mainstream media's hyperbole.

The AI crowd, too, was pleased with the result and the attention, but *dismayed* by the fact that Deep Blue was hardly what their predecessors had imagined decades earlier when they dreamed of creating a machine to defeat the world chess champion. Instead of a computer that thought and played chess like a human, with human creativity and intuition, they got one that played like a machine, systematically evaluating 200 million possible moves on the chess board per second and winning with brute number-crunching force.

http://www.nybooks.com/articles/archives/2010/feb/11/the-chess-master-and-the-computer/

2. Exercice : FIND THE SYNONYMS AND THE ANTONYMS OF THE WORDS FROM THE SUGGESTED LIST

LIST: humanity - chalice - depressed - melancholy - running - comforted - cheerfulness - excited - confounded - amazement - finally - a victory or a defeat - never - dominant - a tie - floating - exposition - calmness - minor - concealment

Example: Exhibition=exposition ≠ concealment

WORDS	SYNONYMS	ANTONYMS
Exhibition	exposition	concealment
1-drifting		
2-leading		
3-a draw		
4-eventually		
5- astonishment		
6- grief		
7- delighted		
8-dismayed		

3. Exercice

Find the right words for the phrases from the text : developed countries - Garry Kasparov - chess players and programmers - the computer

1-the enormous calculating power =

2-the first world =

3-the computer chess people =

4-the former world chess champion =

THE ADVANTAGES AND DRAWBACKS OF ARTIFICIAL INTELLIGENCE

III

1. THE ADVANTAGES AND DRAWBACKS OF ARTIFICIAL INTELLIGENCE

With artificial intelligence, the chances of error are slim or almost nil and we see greater achievement in precision and accuracy. Next, Artificial intelligence finds applications in space exploration. Intelligent robots can be used to explore space. They are machines and hence can endure the hostile environment of the interplanetary space. Intelligent robots can also be used for mining (exploration) purposes. We can harness the intelligence of machines for exploring the depths of oceans. Another profitable use of artificial intelligence is when intelligent machines replace human beings in many areas of work. Robots can do certain laborious tasks which humans do with much energy or are incapable of doing. Machines do not require sleep or breaks and can function without stopping. They can continuously perform the same task without getting bored or tired. When employed to carry out dangerous tasks, there is a reduction in the risk to human health and safety. With devices like smartphones, artificial intelligence is useful in texting (text prediction, spelling correction), locating (GPS and Maps applications), voice interactions. Also, Fraud detection in smart card-based systems is possible with the use of Artificial Intelligence. Financial institutions and banks employ Artificial Intelligence to organise and manage records. Emotions that often intercept rational thinking of a human being are not a hindrance for artificial thinkers. Because of this lack of the human emotional side, robots can think logically and (are guaranteed to) take the right decisions. Let's mention the fact that robotic radio surgery helps achieve precision in the radiation given to tumours, thus reducing the damage to surrounding tissues. On the opposite, the maintenance and the repair of machines is costly. Also, programs need to be updated to suit the changing requirements, and machines need to be made smarter. Procedures to restore lost code or data may be time-consuming and costly. Machines may be able to perform repetitive tasks for long, but they do not get better with experience as humans do. They are not able to act any different from what they are programmed to do. Machines may not be as efficient as humans in adapting their responses to changing situations. If robots begin to replace humans in every field, it will eventually lead to unemployment. Thinking machines will govern all the fields and populate the positions that humans occupy, leaving thousands of people jobless. With the massive application of artificial intelligence, humans may become overly dependent on machines, losing their mental capacities.

2. Exercice : COMPLETE WITH "advantage" or "disavantage" to decide whether each element of the list is an advantage or a disadvantage

1-think logically :

2-space exploration :

3-texting :

4-unemployment :

5-Fraud detection :

6-the chances of error are slim or almost nil :

7-machines are not able to act any different from what they are programmed to do :

8-organising and managing records:

9- locating :

10-mining :

11-humans may become overly dependent on machines, losing their mental capacities :

12-the maintenance and the repair of machines is costly :

13-restoring lost code or data may be time-consuming and costly :

14-radio surgery :

15-do certain laborious tasks :

16-voice interactions :

3. Exercice : fill in the gaps with words from the list

do tasks - autonomy - Artificial Intelligence - security -deprive - exploration

Scientists create   (AI) to make their lives easier. Machine can now act like humans and

that seem difficult and dangerous. In addition,   is enforced with Artificial Intelligence. Space and soil

are possible with AI. Nonetheless, Artificial Intelligence   people from their

and job opportunities

THE LANGUAGE SPOT

IV

1. THE SIMPLE PAST TENSE

In 1985, in Hamburg, I *played* against thirty-two different chess computers at the same time in what is known as a simultaneous exhibition. I *walked* from one machine to the next, making my moves over a period of more than five hours. The four leading chess computer manufacturers *had* sent their top models.

The highlighted verbs are at the simple past tense.

The simple past is used to talk about a completed action in a time before now. Duration is not important. The time of the action can be in the recent past or the distant past.

Simple past tense for regular verbs :

- *affirmative : subject + verb +ed*

example : He worked ; I listened ; they opened the door

negative : subject + did not + verb

example : They did not come ; We didn't see them.

- *interrogative : Did + subject + verb + ?*

example : Did you arrive on time ?

- *Interro-negative : Did not + subject + verb + ?*

example : Didn't you hear the bell ?

- *Some adverbs introducing the simple past :*

last........

...... ago

in + past date (1990)

yesterday....

formerly.......

previously.....

In the past

example : Yesterday, they called their mother.

- *Asking questions about a part of a sentence*

→*Yesterday*, they called their mother

When did they call their mother ?

→Yesterday, they called *their mother*.

Who did they call yesterday ? (cf. res_verbsirréguliers.pdf)

[cf.]

2. Exercice

Write the verbs between brackets correctly

1.Sam (visit)   his girlfriend last weekend.

2.Ray (arrive)   two days ago.

3.We (go)   to the cinema last night.

4.I (be)   at the supermarket this morning.

5.She (see)   Sarah at the bar last week.

Fill in the gaps with the negative form of the verbs

1.I phoned Tina yesterday. => I   Tina yesterday.

2.I tidied up my room. => I did   up my room.

3.Sam became a lawyer. => Sam   a lawyer.

4.We found the map. => We   the map.

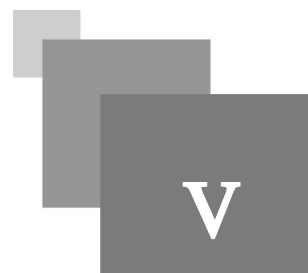5.He spoke Japanese to her. => He   Japanese to her.

Ask questions about the highlighted words:

1.Tom swam in the lake. =>   ?

2.Tina paid the rent. =>   ?

3.I grew up here. =>   ?

PRODUCTION PHASE

V

1. WRITING

Form a work group of about five students then do the task below.

Before the invention of smart machines, former machines had different features. Write down a paragraph in which you will mention at least five (5) characteristics of former machines then express your preference.