

WEBINAR ON THE PASTORAL AND EDUCATIONAL CHALLENGES OF THE ARTIFICIAL INTELLIGENCE

Petricca Riccardo



UISG – March 29, 2023



**INTERNATIONAL UNION
SUPERIORS GENERAL**



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WEBINAR ON THE PASTORAL AND EDUCATIONAL CHALLENGES OF THE ARTIFICIAL INTELLIGENCE

WEBINAR

March 29, 2023 2pm-3.30pm (Rome time)

PASTORAL AND EDUCATIONAL CHALLENGES OF THE ARTIFICIAL INTELLIGENCE

Dialogue with
Eng. Riccardo Petricca

Metaverse, ChatGPT, Gaming, Machine Learning call us to reflect on their impact in pastoral care and education.

Webinar will be held in Italian.
English translation will be provided.

Online Registration: <http://bit.ly/3TdftN>

Next webinar:

May 24: Leadership in the Digital Era
(for Superiors General and their Councils)



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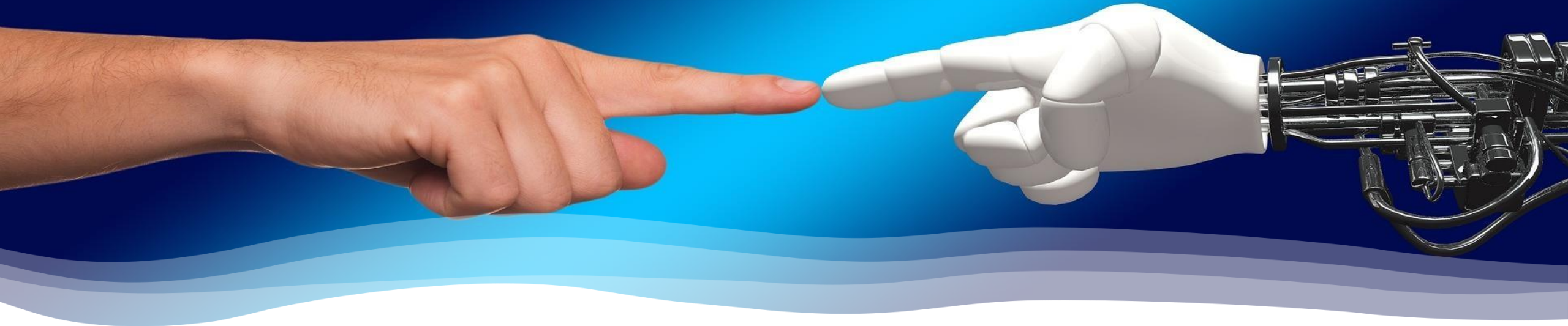
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ARTIFICIAL INTELLIGENCE

Artificial intelligence is a set of several technologies, that by interacting allow machines to perceive, understand, act and learn, with degrees of intelligence that resemble human intelligence.

It is subdivided in:

- Artificial general (or «strong») intelligence
- Artificial narrow (or «weak») intelligence



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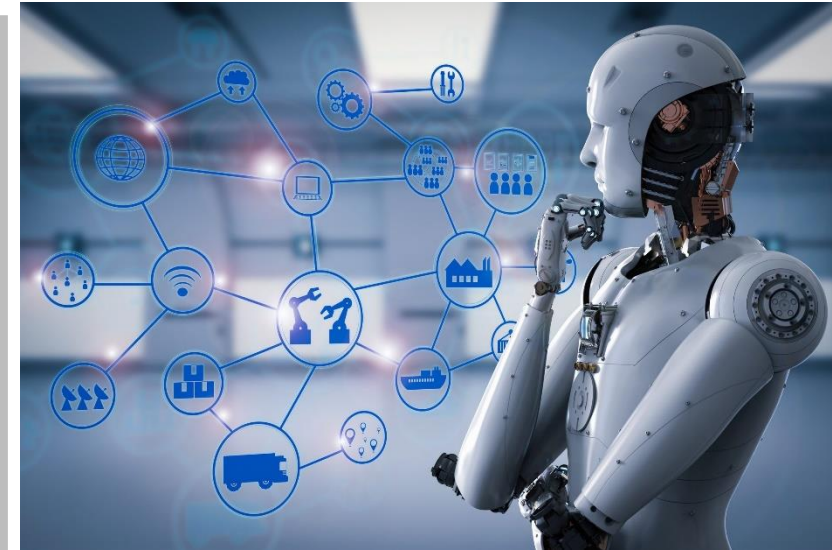


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ARTIFICIAL GENERAL OR “STRONG” INTELLIGENCE

Artificial general intelligence is what you can see in SCI-FI movies, where sentient machines emulate human intelligence, their reasoning having a strategic, abstract and creative approach, being able to manage may complex tasks.

No such artificial intelligence has been developped so far.



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NARROW OR «WEAK» ARTIFICIAL INTELLIGENCE

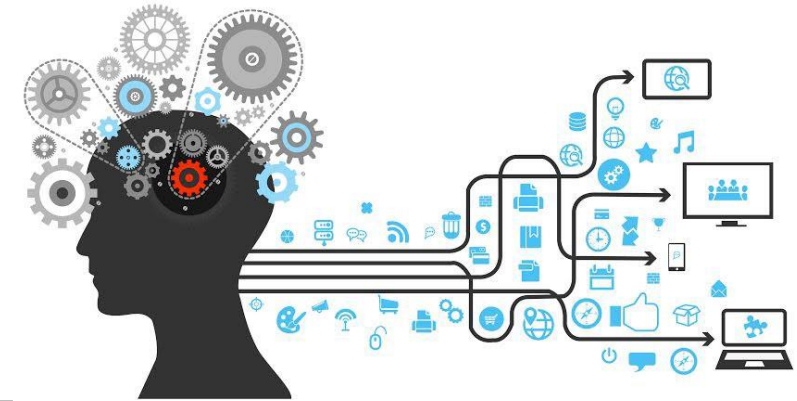
Most of the AI applications that we use in our daily life can be described as belonging to the **narrow artificial intelligence**.

Such applications carry out either a single task or a set of strictly interrelated activities.

These systems are effective, but the framework in which they operate is actually quite limited.

If correctly used, narrow AI has a huge potential for transformation and has been continuously and globally influencing our way of life.

This category also encompasses **Machine Learning**.



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EXAMPLES OF ARTIFICIAL INTELLIGENCE



Google Assistant



Hey Siri



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LINGUISTIC IT / COMPUTATIONAL LINGUISTICS

Computational linguistics is a field of study, concerned with the IT systems aimed at the understanding and production of natural language.

The issues that computational linguistics deals with – as also its name points out – relate to identifying and developing mediation strategies to connect human language, a constantly evolving field of study, and the understanding abilities of machines, though limited to what has been stated in some formal rules.

At the beginning of the second half of the XX century, two different research trends paved the way for the current computational linguistics:

- a) the studies of [fr. Roberto Busa](#) concerning the use of computers as means for the storage and analysis of texts (during the '50s and '60s), whose first achievement was the first-ever electronic *corpus* of the works of [Thomas Aquinas](#);
- b) the implementation of formal methodologies in the above-mentioned text analyses (during the '60s and the '70s), that went hand in hand with the progress being made in the field of [Artificial Intelligence](#).

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LINGUISTIC IT / COMPUTATIONAL LINGUISTICS



Father Roberto Busa ([Vicenza](#), November [28th 1913](#) – [Gallarate](#), August [9th 2011](#)) was an Italian [Jesuit](#), [linguist](#) and [computer scientist](#). He was a pioneer in the usage of computer technologies for linguistics (a discipline which is currently known as [Computational Linguistics](#)). He was the author of the «Index Thomisticus», a complete [lemmatization](#) of the works of [Thomas Aquinas](#) and of some closely-related texts.

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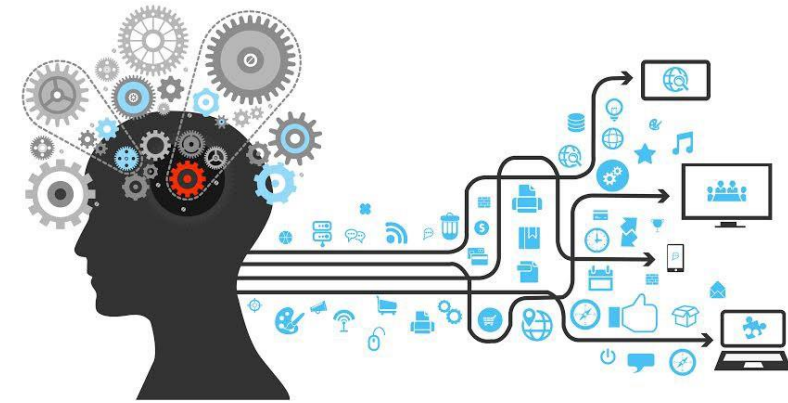
MACHINE LEARNING

Machine Learning (ML) aims at developing systems that can **learn (or improve their performance) based on the data they use.**

Nowadays, machine learning is used practically everywhere: in banks, in the field of e-commerce, in social media, in the apps of our smartphones, in the TV streaming programs and in many other fields.

Some techniques that are proper of machine learning have the human brain (**neural networks**) as their model.

The most advanced neural networks are part of the field of **Deep Learning.**

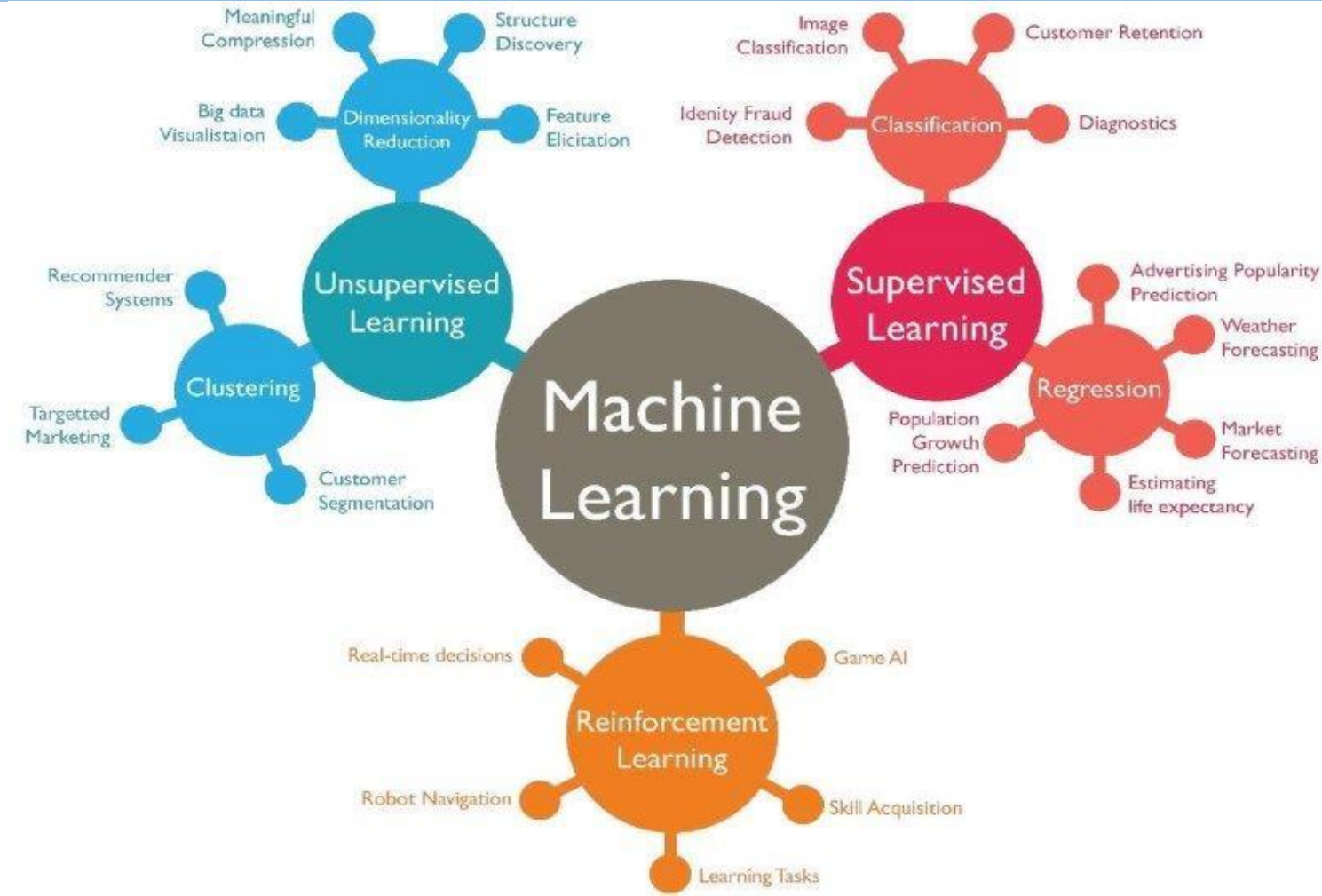


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<https://www.key4biz.it/quali-diversi-tipi-machine-learning/215006/>



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APPLICATIONS OF MACHINE LEARNING

SUPERVISED MACHINE LEARNING

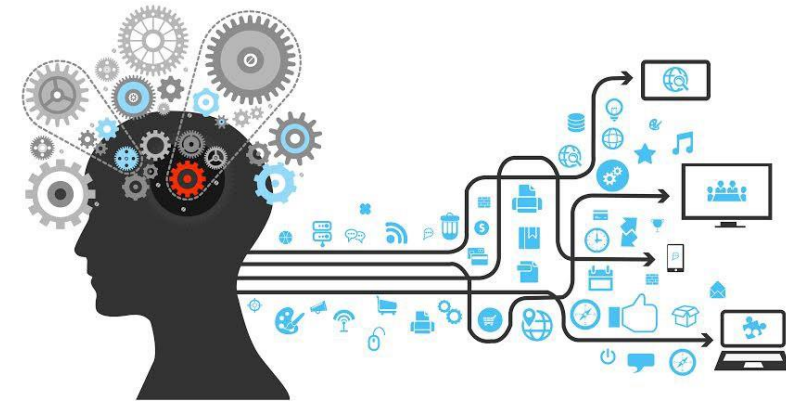
- Information clustering (concerning customers, offers, patients, cases, etc.)
- Analysis of frauds and anomalies

UNSUPERVISED MACHINE LEARNING

- Recommendation engines
- Sentiment and Emotions Analysis
- Diagnosis of diseases
- Face detection
- Terrorism prevention
- Writing and voice detection

REINFORCEMENT LEARNING

- Independent learning



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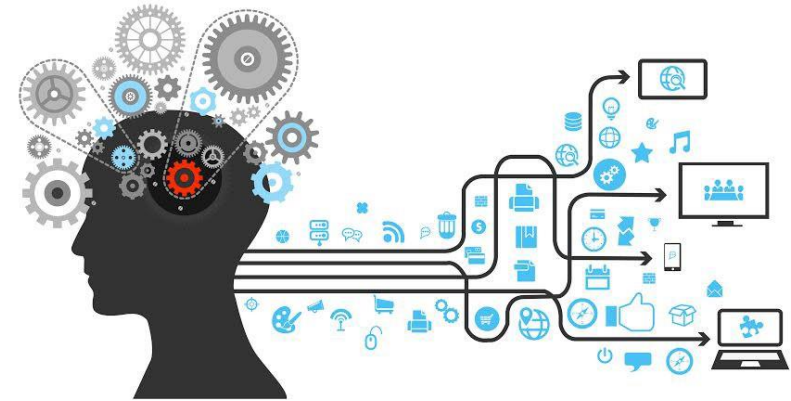


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SUPERVISED VS UNSUPERVISED MACHINE LEARNING

Supervised Machine Learning is characterized by a *training set*, i.e. data from which an algorithm derives a formula, that it is going to apply in the analysis of new data.

In unsupervised Machine Learning, we add new inputs and knowledge, without any previous training of models. New data are derived from the analysis of existing data.



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sample



Cluster/group

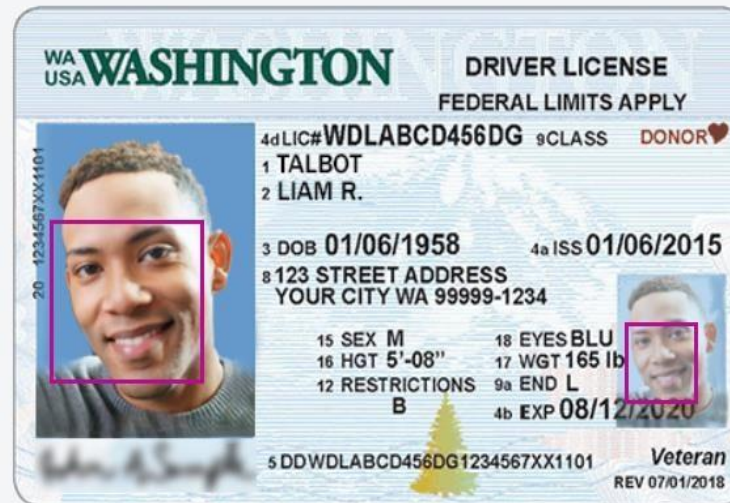
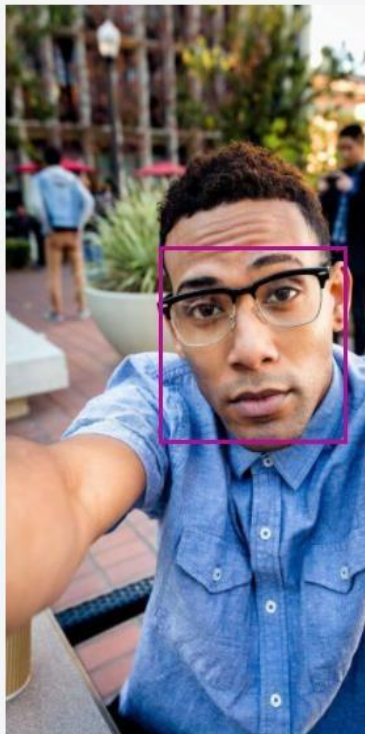
Clustering

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Verifica la probabilità che due visi appartengano alla stessa persona e ricevi un punteggio di attendibilità.



Models of
Machine
learning for
face
detection

URL immagine

Invia

Cerca

URL immagine

Invia

Cerca

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Gaming and AI
In the *Go* boardgame, the number of valid positions exceeds that of the atoms that can be calculated in universe.

Thus, it was generally thought that PC would have never been able to win this game.

In 2016, *AlphaGo* beat the world champion Lee Sedol, winning all but the fourth game.

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THE RISKS OF ARTIFICIAL INTELLIGENCE, AS IDENTIFIED BY *MIT*

Privacy-related problems, among which **Face detection**, whose misuse can damage users with many forms of privacy violations. (pictures taken by a vacuum-cleaner)

Use of autonomous weapons, on which research has been long focusing and whose seriousness has now made a comeback, following the outbreak of the conflict in Ukraine.

Deep Fake, i.e. fake-content videos, created by AI, that are often so realistic as to be considered as true, and which may also involve celebrities.

Race- and gender-based discriminations which, as several studies showed, are an intrinsic part of the algorithms on which artificial intelligence is based. If this technology were systematically used in the job field, it could originate several problems, e.g. during staff recruitment.

Social manipulations

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THE RISKS OF ARTIFICIAL INTELLIGENCE, AS IDENTIFIED BY *MIT*

«A superintelligent AI will be extremely good at accomplishing its goals, and if those goals aren't aligned with ours, we're in trouble. You're probably not an evil ant-hater who steps on ants out of malice, but if you're in charge of a hydroelectric green energy project and there's an anthill in the region to be flooded, too bad for the ants. Let's not place humanity in the position of those ants.».

Stephen Hawking

Artificial intelligence is a discipline on which [scientists](#) and [philosophers](#) have long debated because its implications are not only theoretical and practical, but also [ethical](#). In 2014, [Stephen Hawking](#) warned us about the dangers posed by artificial intelligence, which he considered as a threat to the survival of humanity.

ETHICS AND ARTIFICIAL INTELLIGENCE

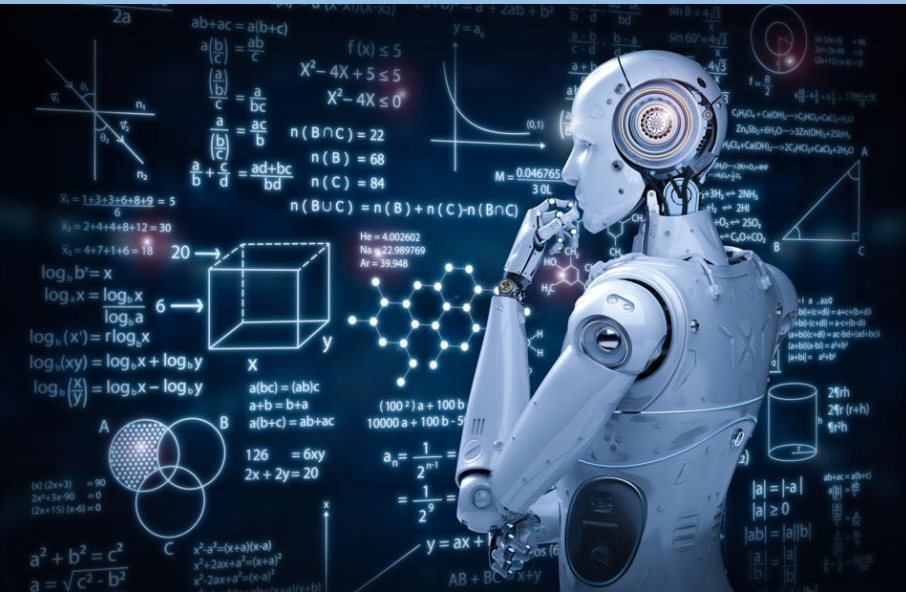
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ETHICS AND ARTIFICIAL INTELLIGENCE

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ETICA E INTELLIGENZA ARTIFICIALE **(ETHICS AND ARTIFICIAL INTELLIGENCE)**



ETHICS AND ARTIFICIAL INTELLIGENCE

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THE 3 LAWS OF ROBOTICS

The three laws of robotics were defined by the Soviet (then naturalized as American) biochemist and writer [Isaac Asimov](#) in the year 1942, in the same short story in which the word «robotics» is first used (i.e. *Runaround*, part of the *Robot* series, which was published in 1950). These laws discipline the functioning of the robots' brain and are a first example of algorethics :

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

In the short story *Robots and Empire* (1985), Asimov then added the **Zeroth Law**, which however only the most sophisticated robots accept and abide by. In order of importance, this law surpasses the other three, allowing for the robots' greater efficiency: **a robot may not harm humanity, or, by inaction, allow humanity to come to harm.**

ALGORETHICS

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Analysis of the ethical problems related to artificial intelligence and, in particular, to algorithm-based tools. ♦ Why is the Vatican concerned about Artificial Intelligence? Monsignor Paglia has no doubt about it. «We felt it was our duty to enter this debate, to be part of this new-born engine which has been quickly advancing and is deemed to strongly develop in the coming future. Technological progress is far quicker than political, economic, ethical or humanistic progress; thus, we need to promote a responsible dialogue to flourish in these new areas». Such areas have a deep impact on human beings and thus require an «algor-ethics», to avoid technology to newly create discriminations against social groups or populations. (from the Italian newspaper *Repubblica*, February 6th 2020, p. 6) • «This is a period of feverish activity for applied research — [Marina] Geymonat explain — but this activity is not only focused on technology. Nowadays, our focus is on algorethics and data humanism. Because this huge information flow must be managed». The most famous virtual assistants have a woman's name. This notwithstanding, AI systems often work with a male chauvinist approach. (Christian Benna, *Corriere della sera.it*, November 3rd 2020, Economia) • «When we developed and undersigned this 'Call' — Mons. Paglia says —, we coined the term 'algorEthics', because algorithms also need a moral dimensions. We must avoid these new technologies to become the new tyranns and those having 'big data' to use them in whatever way they prefer. Moreover, we wouldn't like technological progress to develop outside of a humanistic sphere ". (Fausto Gasparroni, *Ansa.it*, May 18th 2021, *Oltretevere Notizie*).

([Vocabolario Treccani](#))

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Let's ask an example of Artificial Intelligence who and what it is

Good morning; we greet AI: Good morning; Good morning! What can I do for you today?

What are you?

I am a language model, called ChatGPT, developed by OpenAI. I have been trained to consistently and naturally answer questions and participate in conversations. What else can I do for you?

Are you an example of Artificial Intelligence?

Yes, I am an example of artificial intelligence. More specifically, I am a language model that was developed by OpenAI and that takes advantage of machine learning to provide answers which are based on the text data I was exposed to during the training process.

What is Artificial Intelligence?

Artificial Intelligence (AI) is an IT branch that aims at developing algorithms and systems that are able to carry out tasks, for which we would normally need human assistance; these tasks may be the recognition of natural language, automatic translation, medical diagnoses and human-level games. AI is founded on the idea that a machine can be programmed to imitate the human intelligence and to solve problems similarly as humans would.



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Let's ask about the risks of AI

What are the risks related to artificial intelligence?

Many are the reasons for concern, as for the impact of artificial intelligence on the social and individual human spheres, among which: Job losses: AI could replace human beings in some job fields, thus causing unemployment. Discriminations and *bias*: If the AI models' training also includes prejudices, these prejudices may be also found in the AI work and performance. Privacy and security: The data that can be collected by AI may also be used for bad purposes, such as surveillance and manipulation. Power asymmetry: AI could put power in the hands of few individuals or organizations, originating an unequal economy. Responsibility and *accountability*: Assessing who is really responsible and to be held accountable for the AI's mistakes may be hard. It is thus crucial to never ignore these concerns and to work committedly, in order to be able to responsibly deal with them, as AI continues developing and spreading in our society.

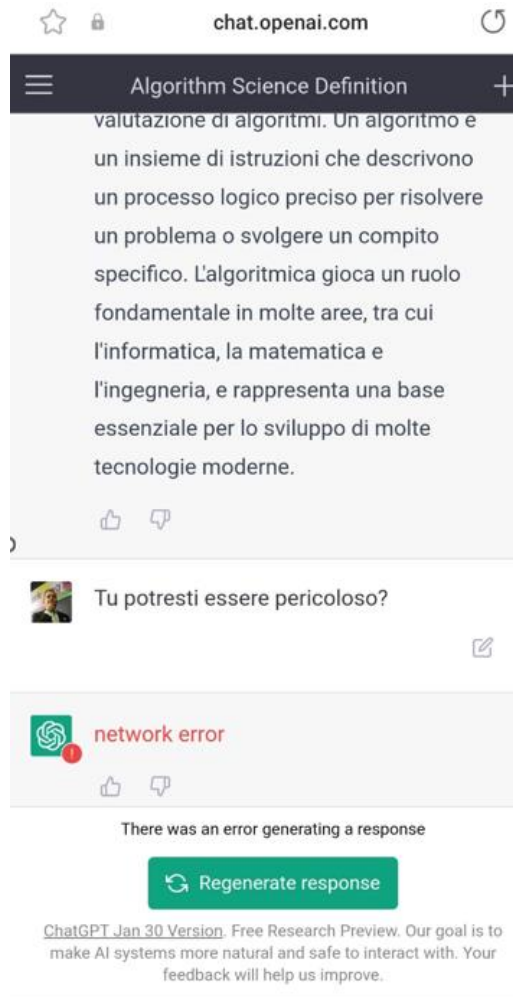


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What happens when we ask it if it may originate risks or dangers?



METaverse



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What is METaverse

It is a virtual, Internet-linked world, that allow users to move about and interact in a fictitious world.

A new, potential evolution of Internet, a virtual collection of integrated and augmented spaces

A whole set of enabling technologies

- Virtual and augmented reality (AR & VR)
- Digital twin)
- Blockchain – NFT – Bitcoins
- Internet of things (IoT)
- Artificial Intelligence (AI)



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CONCLUSION

As we discovered, the AI ethics has been a subject of high interest for academicians, political decision-makers, the AI professionals or producers, as well as for the great public. Most research supports the need for an AI ethics, to avoid the potential risks it may bring with it (such as inequalities, biases, privacy violations, etc.). Other studies defined principles and drafted reference frameworks for the incorporation of ethical principles in AI systems. However, among the various studies that have been published on the AI's ethical principles, we can see a gap between high-level principles and the practical techniques that can be implemented to plan and develop ethical AI systems...

Nowadays, every field, especially the Pastoral one, urgently needs to implement and use new technologies (e.g. in areas like cybersecurity, Blockchain, NFT,...), but most importantly to deepen its analysis and carefully study its ethical and pedagogic implications.

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Thanks for your attention



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