Artificial Intelligence: pros and cons

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26-28 November
Santa Fe, Argentina
What is Artificial Intelligence (AI)?

Object of research -> Intelligence

Artificial Intelligence is the field of computer science that makes intelligent machines – whatever that means –

Neil Gershenfeld – MIT
What is Artificial Intelligence (AI)?
What is Artificial Intelligence (AI)?

Turing test

Thinking

Learning

Knowledge representation

Natural language processing

I'm not a robot

I'm not a robot
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Machine learning for a 5G future

IOT + Cloud + Big data + AI = Smart

COMMUNICATION!

Illustration: iStockphoto
IOT + Cloud + Big data + AI = Smart

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Performance + capacity + speed

 interoperability

IOT + Cloud + Big data + AI = Smart
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Collect ideas and feedback

Identify problems

Suggest solutions

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Satellite image analysis
Agricultural care
Crop Wharehouse control
Wheather forecast and harvest control
Animals Monitoring – nutrition - weight
Animals genetic and reproduction
Monitoring temperature and humidity

IOT

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Garbage collector

Energy in the underground train lines

Urban planning

Citizen security
Learning level

Student-centered education

Student learn in their own pace

Helps professors

Learning paths

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What We Talk About When We Talk About

**Machine Learning**?
Formally...

“Machine learning is an application of artificial intelligence that provides systems with the ability to automatically learn and improve from experience, without being explicitly programmed.”

A. Samuel
Applications in Different Domains

Processing Capacity

Big Data

Machine Learning
Machine Learning Interdisciplinary Field
Why we use Machine Learning?

- Human **expertise does not exist** (exploration of planets, e.g. Marts)
- Humans **cannot explain their expertise** or reduce it to a rule set, or their **explanation is incomplete** and needs tuning (e.g. speech recognition)
- Humans are **expensive to train up** (e.g. zipcode recognition)
- There are large **amounts of data** (e.g. discover astronomical objects)
ML Approaches

Choosing the learning approach to be applied depends on the type of problem to be solved.
Supervised learning requires training with labeled data which has inputs and desired outputs.
Unsupervised learning which does not require labeled training data and the environment only provides inputs without desired targets.
What is machine learning workflow?
When would we use Machine Learning?

- **Pattern Recognition**
  - Facial identities or facial expressions
  - Handwritten or spoken words (e.g., Siri)
  - Medical images
  - Sensor Data/IoT

- **Anomaly Detection**
  - Unusual patterns in the telemetry from physical and/or virtual plants (e.g., data centers)
  - Unusual sequences of credit card transactions
  - Unusual patterns of sensor data from a nuclear power plant

- **Prediction**
  - Future stock prices or currency exchange rates
Machine Learning Applications
More and More
Research Topics at CIDISI

- Software Engineering
- Natural Language Processing
- Energy
- Bioinformatics
AI achievements...

- Corrupt Detection
- Sustainable Development
- Security
- Communications
- Health
- Environmental Care

AI FOR GOOD
Devices and machines → more practical and smarter

Many examples show bad use of AI…
Thus, “Destructive AI”?

How much should we fear the rise of artificial intelligence?
AI Fears…

- BIAS?
- SECURITY?
- JOBS?
- DATA PRIVACY?
AI Fears…

It is possible to train neural networks with a set of data that make systems learn what we want…

– Systems can be racists…
– Systems can learn from gender segregation…
– Systems can be subjective and partial…
AI Fears…

SECURITY?

- Intelligent systems are responsible for
  - Monitoring safety,
  - Participating in wars,
  - Controlling soldiers,
  - …
AI Fears…

SECURITY?

What happens when the human is not part of the control loop?

- Computers reported American attack with misiles.
- Protocol → respond with nuclear attack.
- Radar controllers confirmed radar had not detected anything.
AI Fears…

What happens when the human is not part of the control loop?

Self-driving car hit and killed a woman.
AI Fears…

DATA PRIVACY?

Influencers  trolls  fake news

ML algorithms feded with bias data  False information

Elections in the USA

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AI Fears...

- Jobs?
- Machines
- Learn faster
- Do not get distracted
- Do not have feelings
- Do tasks faster
AI Fears…

AI stealing our jobs?

Will human work continue existing?

Could I lose my job to a machine?
AI Fears…

JOBS?

Amazon Go
Al Fears…

JOBS?

Amazon Go
AI Facts

- **Machines are capable of learning**
  - they also have limits and their technologies need to be constantly improved.

**Human beings will have to tackle the design of these machines**
AI Facts

- **AI wouldn’t destroy jobs**
  - but would substantially alter the employment landscape by stimulating the creation of highly qualified positions requiring advanced technical skills.

  *New forms of work*

  ...Every time machines were created, they also generated new types of work....
AI Facts

- We must not fight against an AI that could replace humans...

  - We must try to find alternative ways of working, with humans that are able to “collaborate” with facilitating machines.
AI Facts

• AI is not science fiction
• AI is all around, everywhere

AI, as all new trends in technology, is not good or bad by itself…

It all depends on the use we give to it… that is the challenge!! …
Diverse trends in AI and ML for a 5G future will be presented in this event.

So, let’s start contributing to the future!
Thanks!