What AI can do and what it cannot do

Nicolas Sabouret

Artificial intelligence and the next generation of competences :
How Digital – and Artificial Intelligence will impact jobs and competences profiles?

The World Conference on Intellectual Capital for Communities

UNESCO, July 11&12 2019

Dreaming of AI and human co-workers

Commercial from a phone manufacturer

Dreaming of AI and human co-workers

- Robots capable of:
  - Autonomous decision
  - Emotions
  - Adaptive behaviour
  - Shared attention

… in a large variety of situations

None of these are possible today…

Robots and humans do not interact in such a natural way

Intellectual Capital for Communities In the Knowledge Economy

What can AI really do today?

…in terms of autonomy and human-AI interactions

Conversational Agents

- Natural Language
- Question Answering
- Facial Animation
- Emotion Expressions

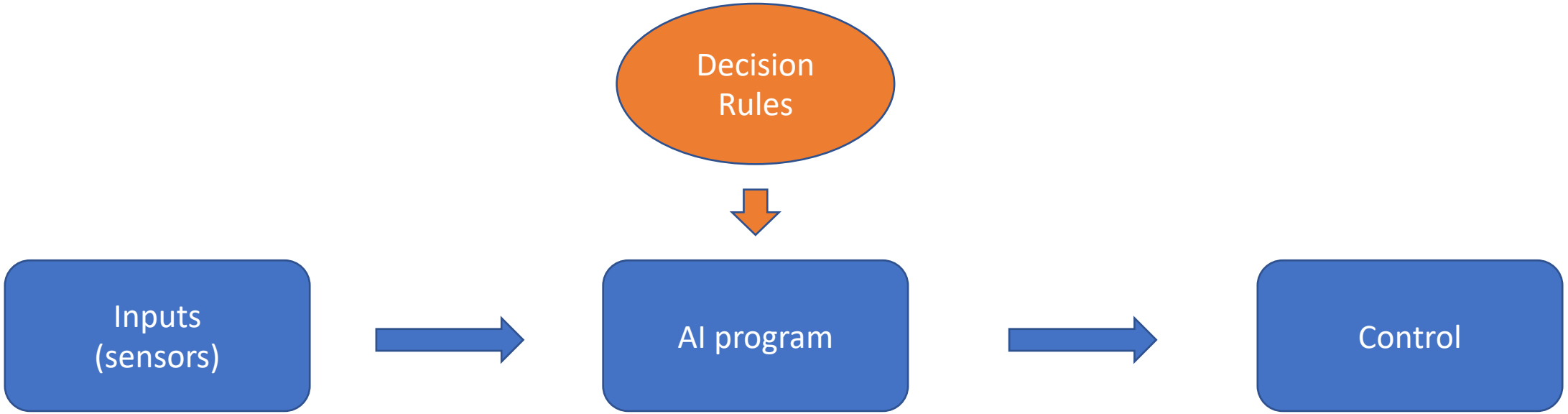
Companion robots

- Scripted Text & Gestures
- Natural Language Control & Command

Autonomous Cars

- Sensors, Image Processing
- Location, Route Planning
- Autonomous Control

Why is it so difficult?



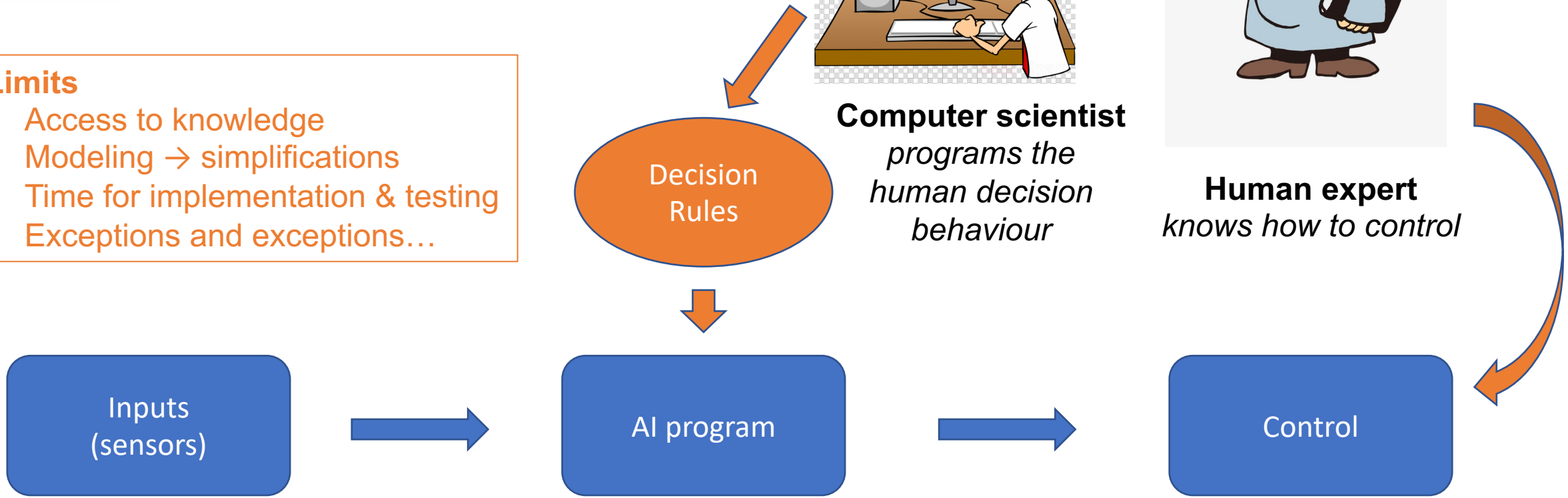
What is exactly a computer (AI) program?

Why is it so difficult?

Limits
- Access to knowledge
- Modeling → simplifications
- Time for implementation & testing
- Exceptions and exceptions…

Computer scientist
programs the human decision behaviour

Human expert
knows how to control

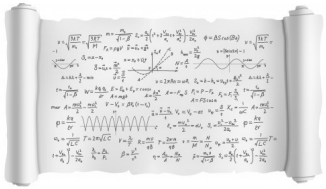


Overview of rule-based systems

Why is it so difficult?

Computer scientist
Implements a ML program

Features



Corpus of Data
*Thousands of examples of **inputs** and the corresponding **decision***

Machine Learning Program

Decision Rules

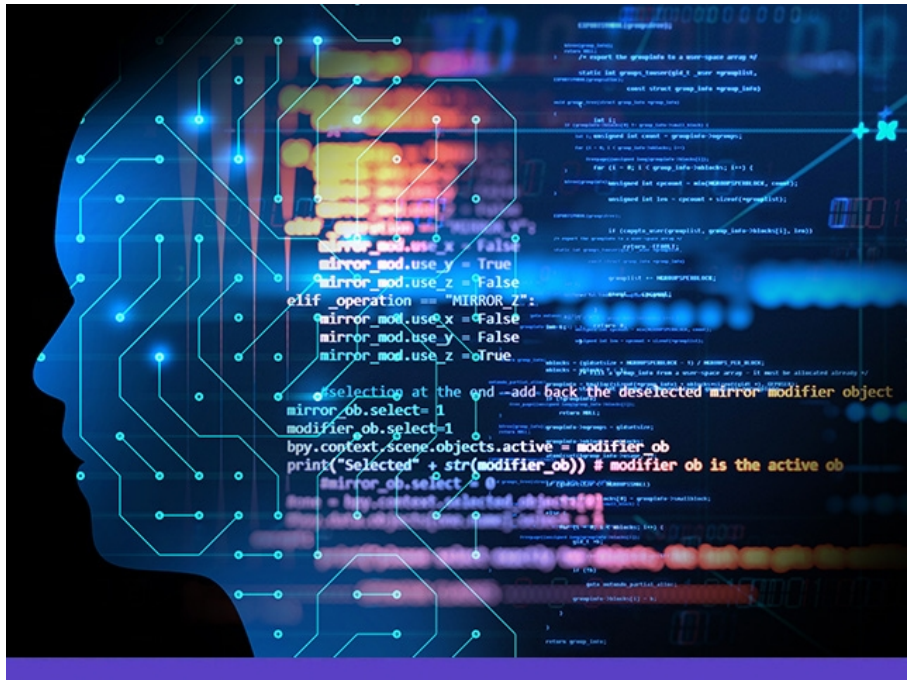
Limits
- Data collection
- Metaparameters
- Explainability

Human expert
*knows which **elements** are important in the decision process*

Inputs (sensors) → AI program → Control

Overview of Machine Learning

Why is it so difficult?



- To write an AI program, you need:
  - Expert knowledge on the domain
  - Computer scientists
  - Tons of data or infinite time of programming

→ Human taskforce and expertise!

AI programs must **make errors!**

Optimal solution **cannot** be computed in reasonable **time**

No matter the method and the computer speed

→ AI is about writing **heuristics** to compute a **reasonably good** solution

Why would AI impact jobs?

- Machines are designed to replace human workforce

E.g. *The Jacquard Loom (source: wikimedia)*

- Computers and robots are made to this purpose!

The Canut Revolts (Lyon, France, 1831-1848)

for better or worse…

vs

Comté cheese manufacturing (Jura, France, 2010)

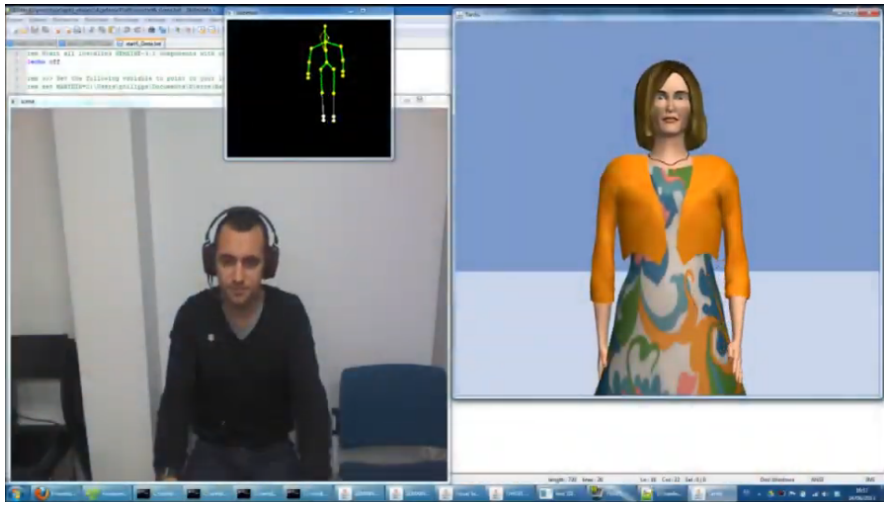
How will AI impact jobs?

The warehouse example

Humans are **not** replaced
→ Their activity is modified
Who receives the benefit ?

The robot nurse

Lack of medical staff
Humans are **not directly** replaced
→ job was not occupied



TARDIS EU project

Training young NEET
No recruitement
Human-AI **collaboration**

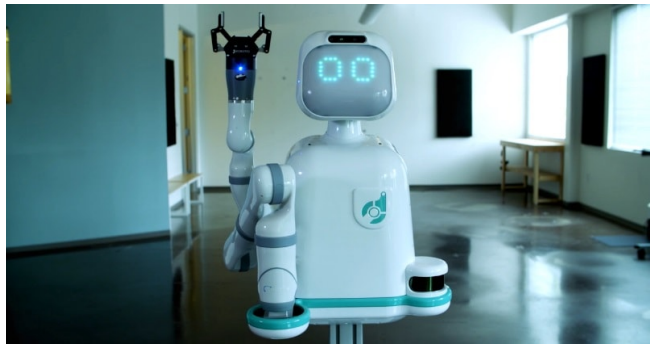
Sources: McKingsley Global Institute, E. Reynolds MIT

How will AI impact jobs?

Two situations can be observed:

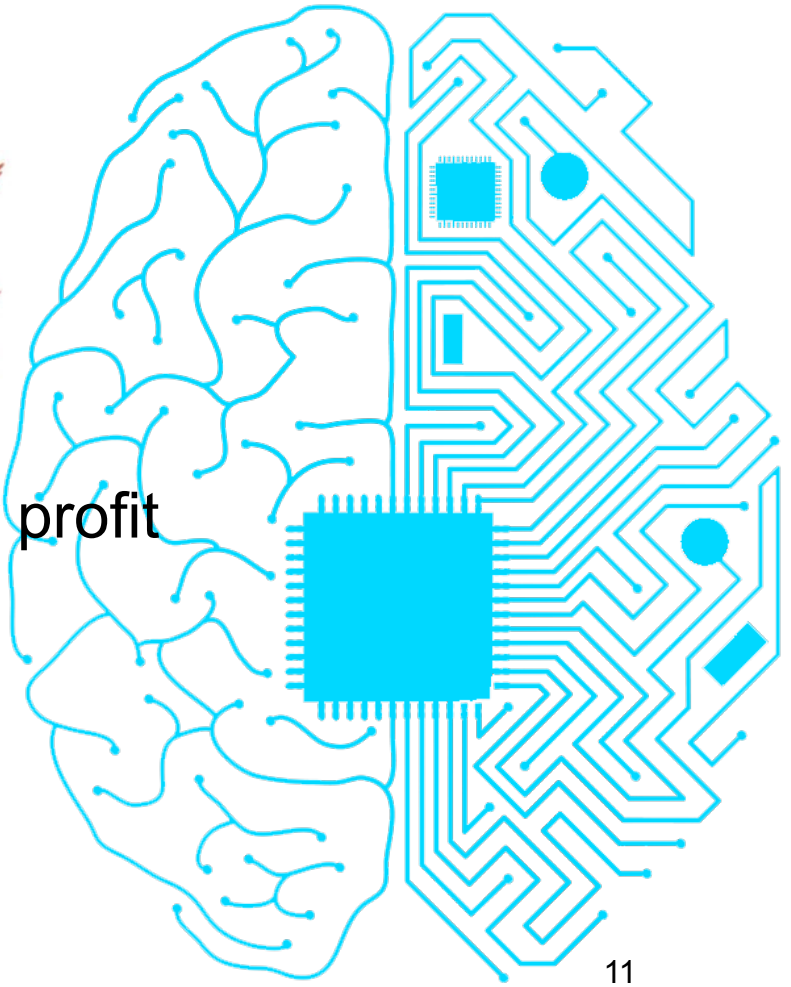
1. Robots that replace human workers
   - Does what a human being could do
   - Not necessarily cheaper
   - Pre-existing cost reduction policies

2. Creation of new jobs, transformation
   - Market extension
   - New skills and competencies



Conclusions

- AI still **needs us**
  - Domain experts
  - Programmers
  - Data collection
- AI **will not replace** us, but…
  - Companies invest in AI products to increase their profit
  - People must decide what to do with AI
- Transformations will occur
  - New jobs, new skills
  - No massive disappearance of jobs due to AI only



Thank you !


Comprendre l'intelligence artificielle
Nicolas Sabouret
Dessins de Lizete De Assis
Docteur, vous comprenez ? Ils croient que je suis intelligent !
Hmm oui... Continuez...
ellipses