



Atelier :
Dernières générations d'IA <>
Exigence en Santé : Compatibilité ?

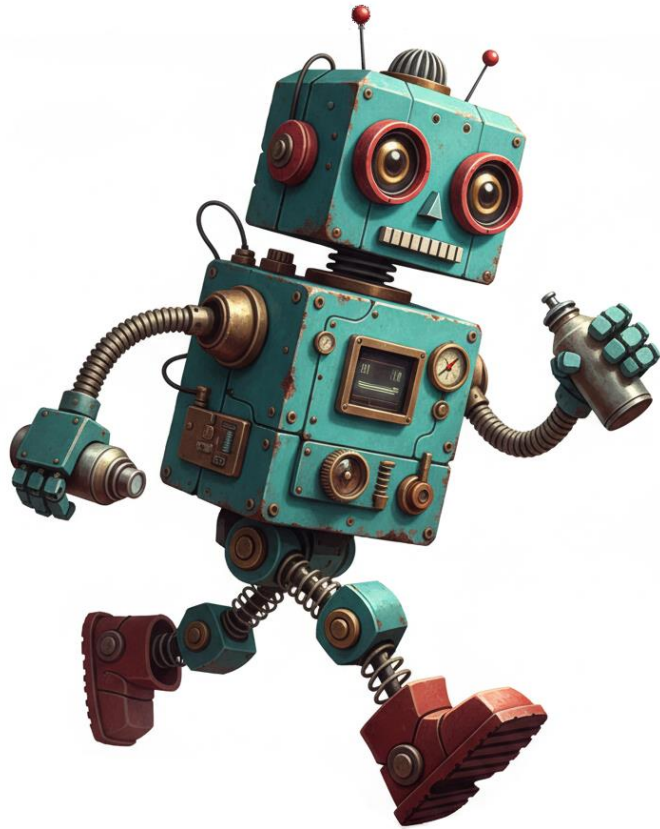
4 novembre 2025 à 17h

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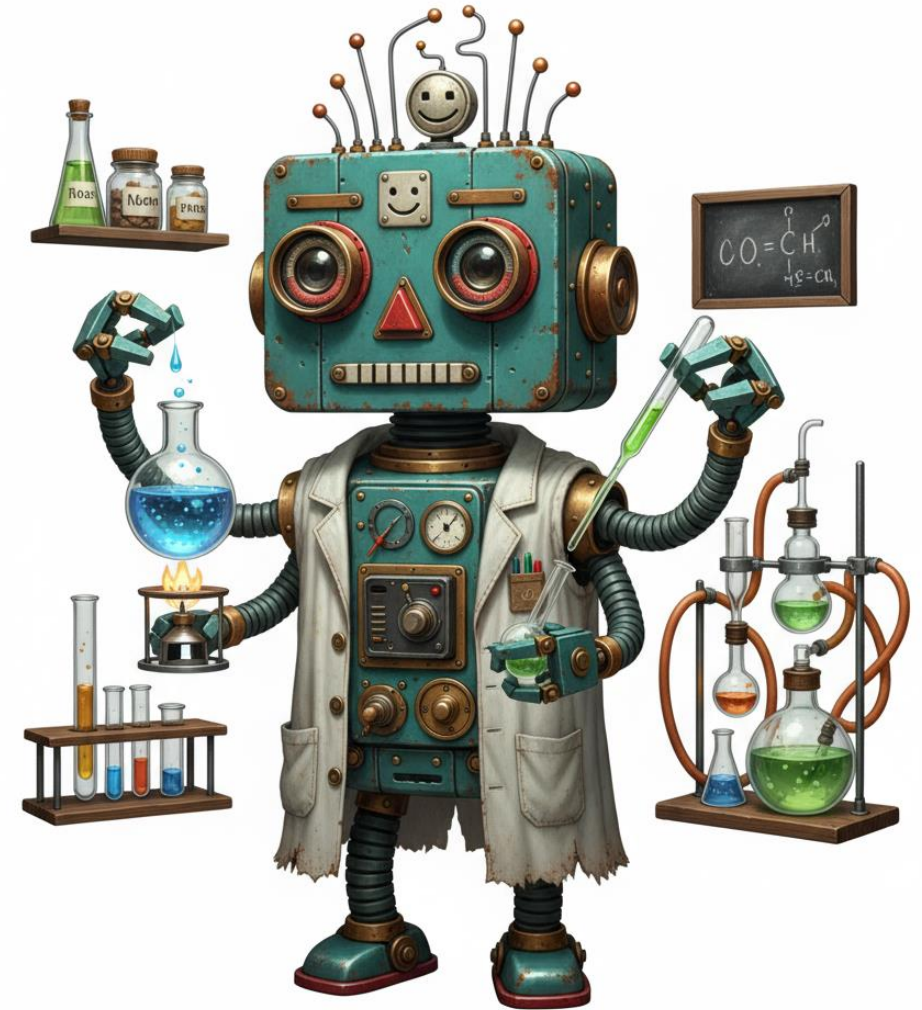
Co-Fonder of iRevolution & Ziwig

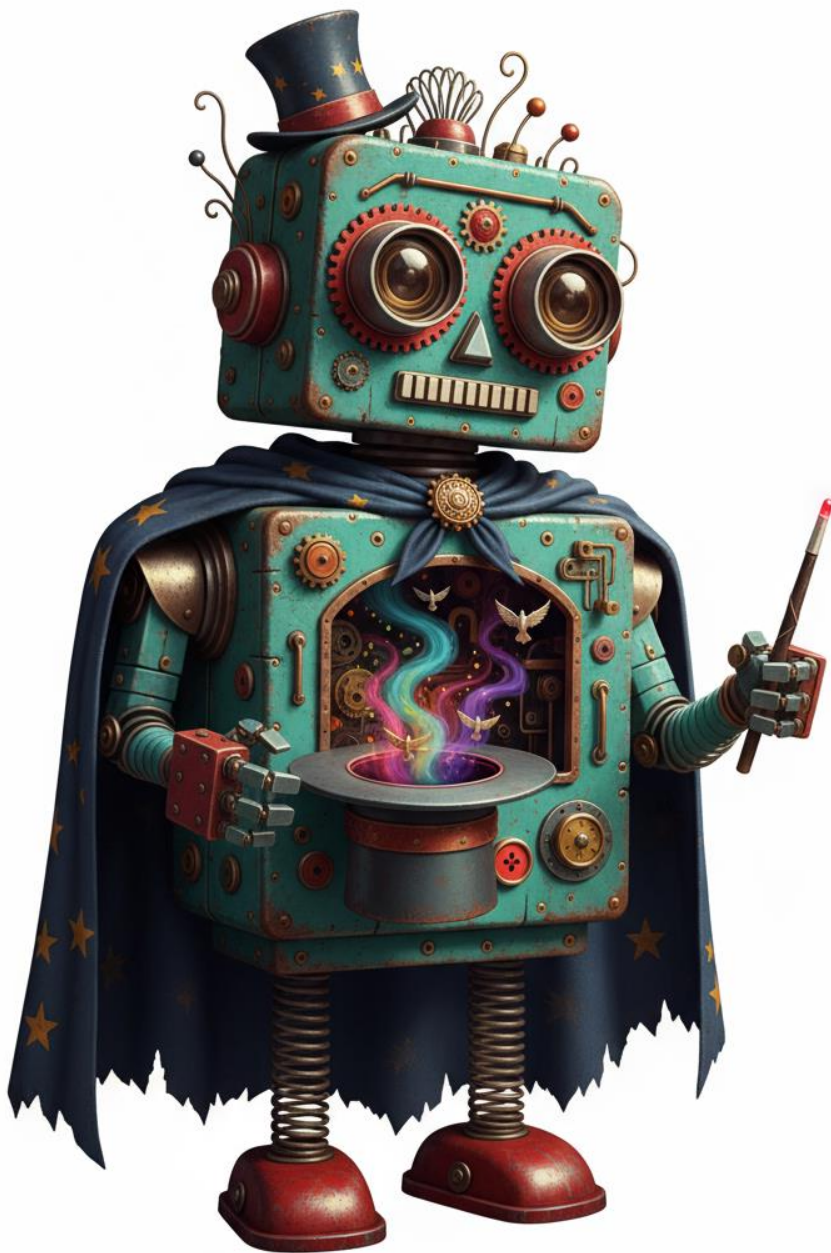
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Les produits dans la santé

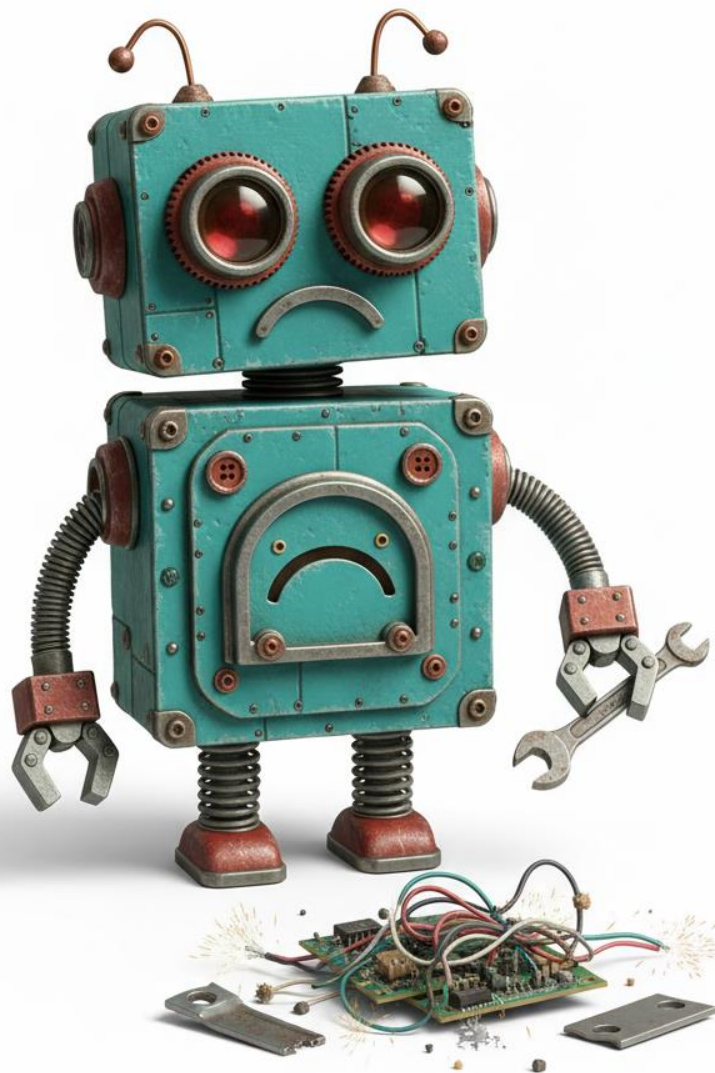
- Sûr
- Performant
- Fiable dans le temps





L'IA générative

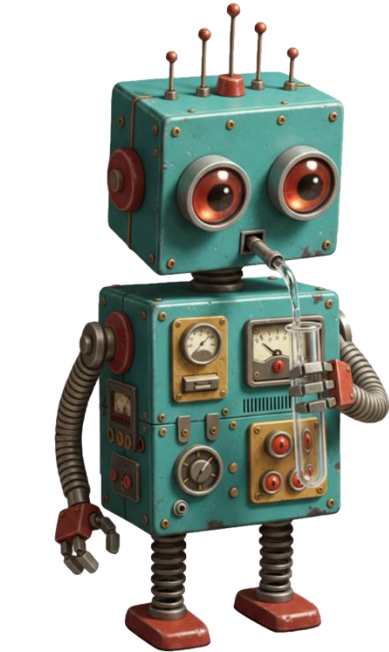
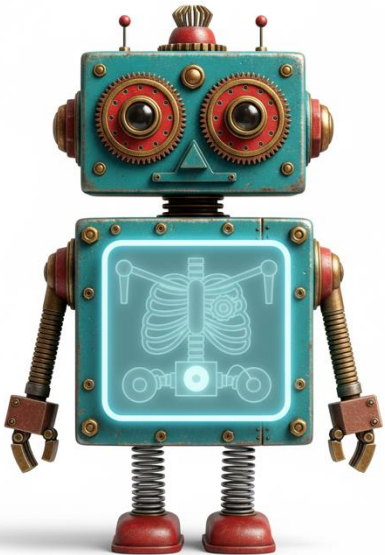
- Non reproductible
- Evolutif
- Multi contexte (profil utilisateur, historique, etc...)



IA et Santé : **Impasse ?**

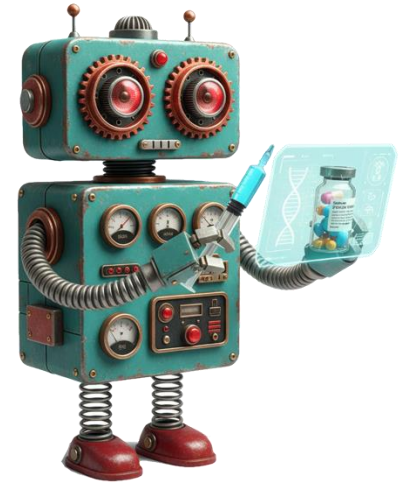
De nombreuses solutions d'IA dans la santé

Imagerie



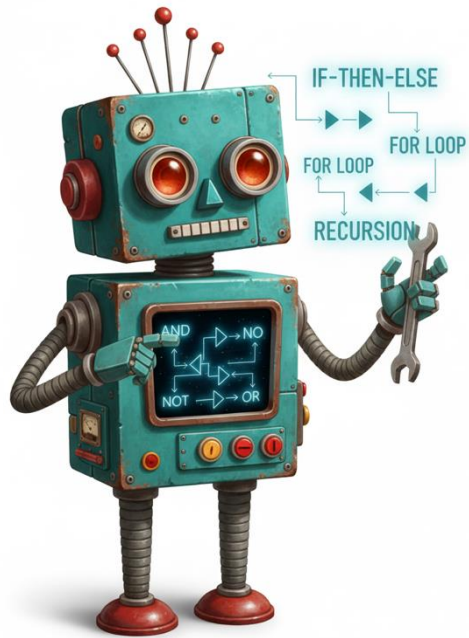
Diagnostic

Médecine
prédictive



Médecine de
précision

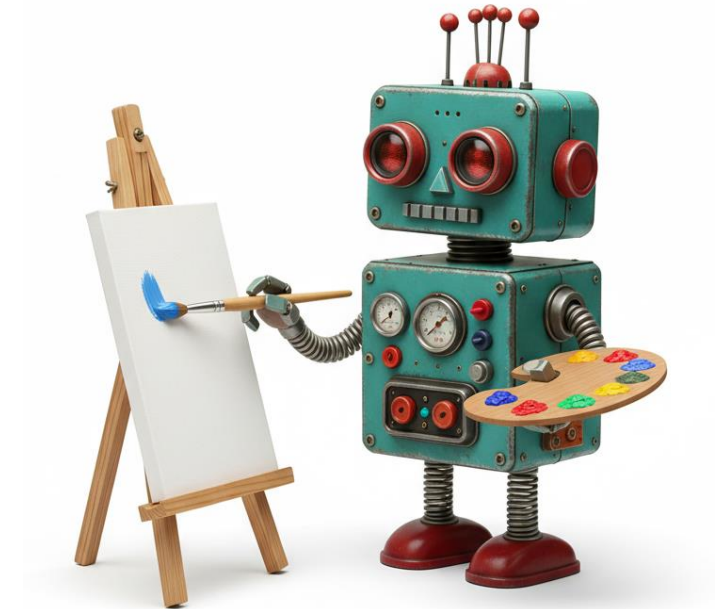
Les 3 grandes familles d'IA



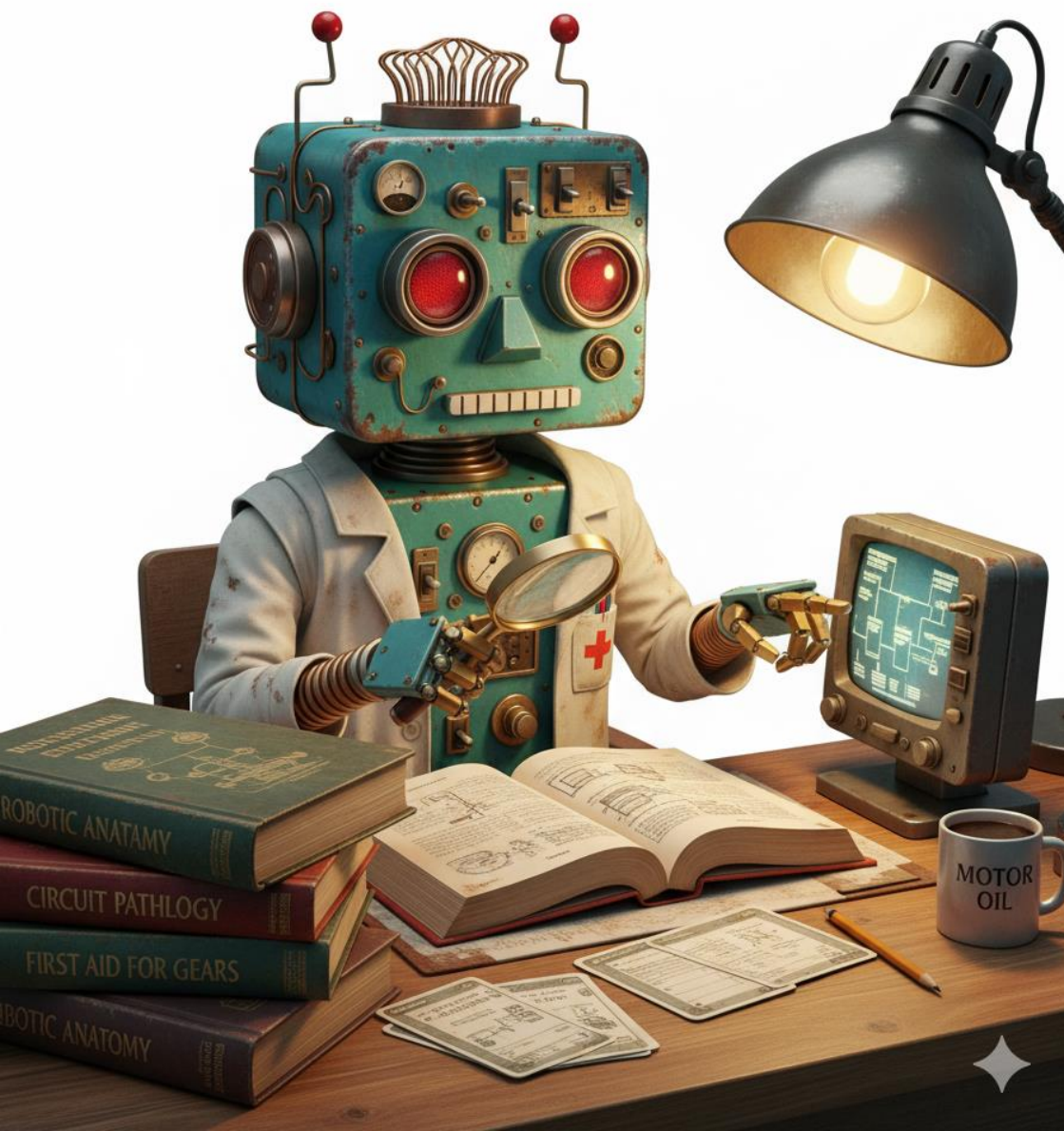
SYMBOLIC AI
(OR LOGICAL AI)



PREDICTIVE AI
(OR MACHINE LEARNING)

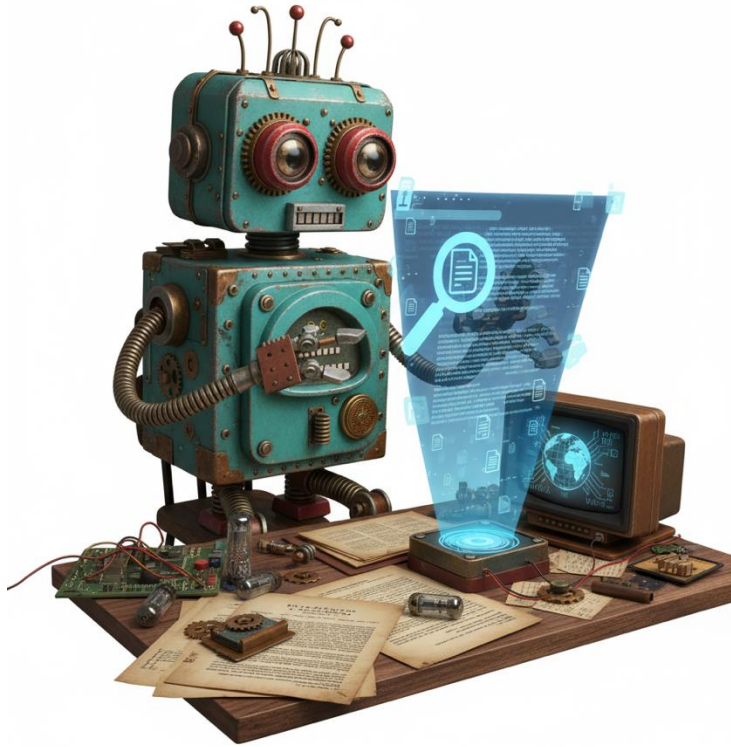


GENERATIVE AI
(E.G., LLMS, DIFFUSION, GANS)

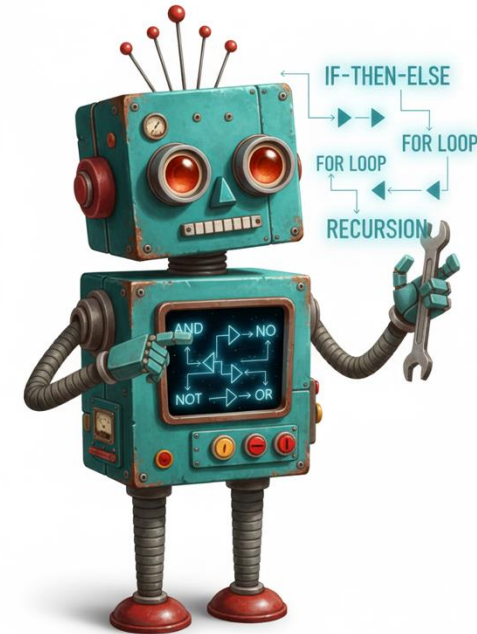


**Le médecin
continue
d'apprendre
pour être
toujours plus
performant**

Savoir vs Raisonnement



Le savoir évolue vite,
et est facilement
accessible



Le raisonnement
nécessite de l'expertise,
plus stable dans le temps

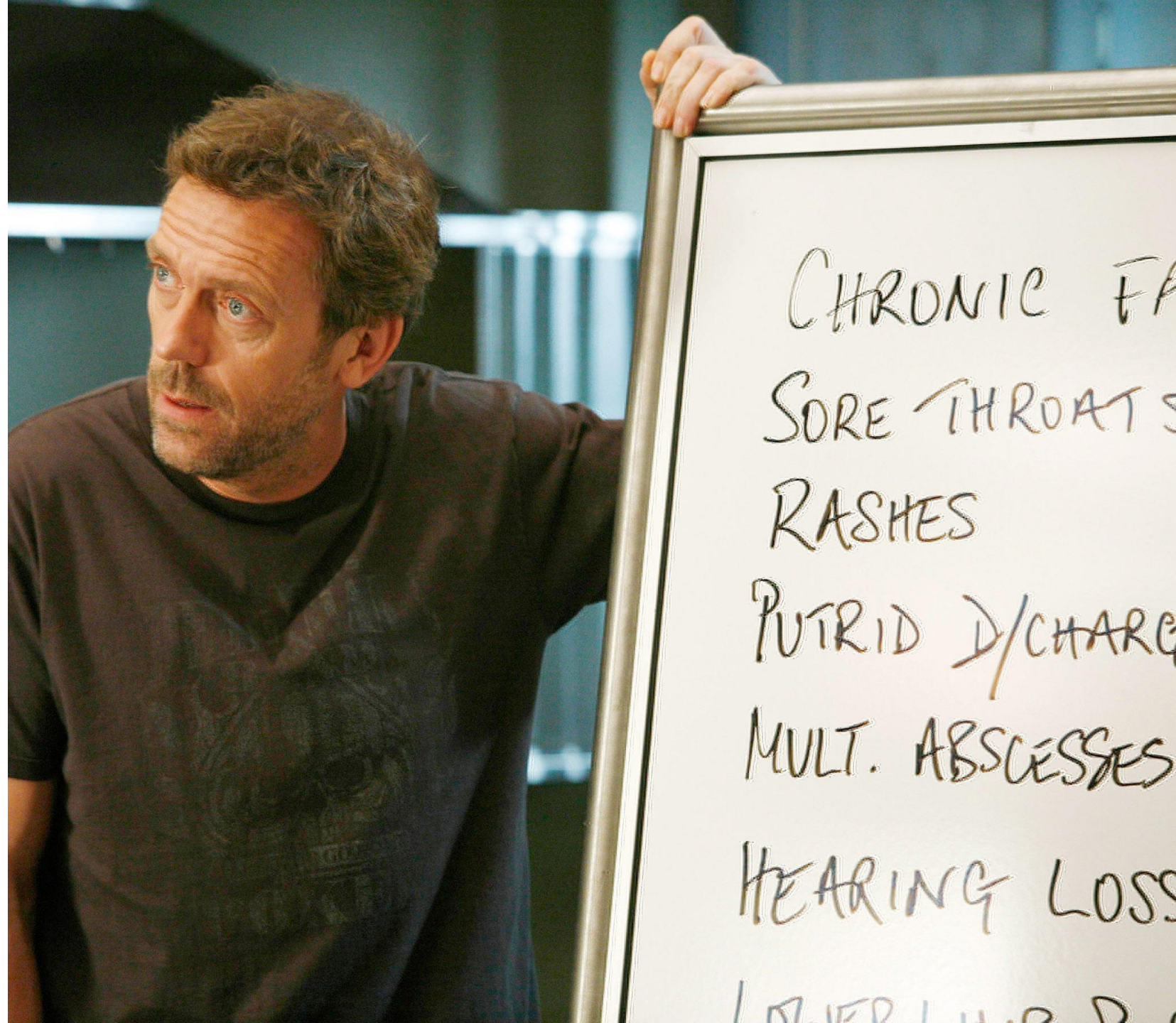


HOUSE

Medical scientific approach

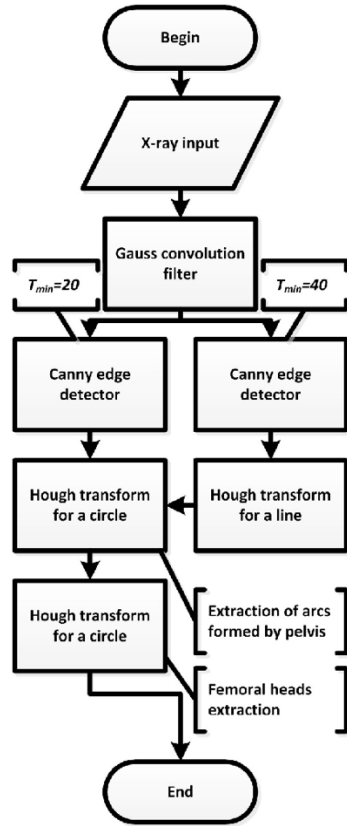
Medical scientific approach :

1. Anamnesis: detailed questioning of the patient to gather essential information
2. Physical examination: physical examination to observe clinical signs
3. Identification of **3 to 5 hypotheses**.
4. **Differential diagnosis**: Compare the patient's symptoms with those of other similar diseases. The aim is to progressively eliminate less likely pathologies and focus on the most plausible cause.
5. **Diagnosis of exclusion**: In certain complex cases, the diagnosis is based on the elimination of all other possible causes.
6. Conclusion and management



CHRONIC FA
SORE THROAT S
RASHES
PUTRID D/CHARGE
MULT. ABSCESSSES
HEARING LOSS
LOVER LUB D

eXplainable AI (XAI)

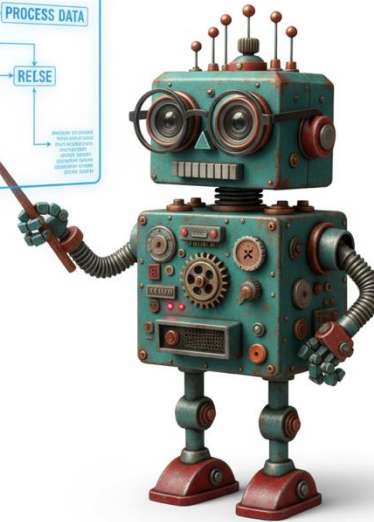
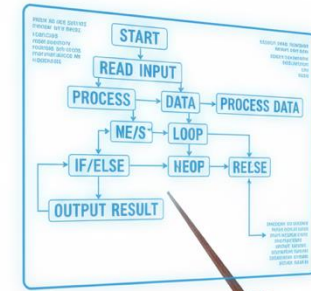


Scientific
Logic

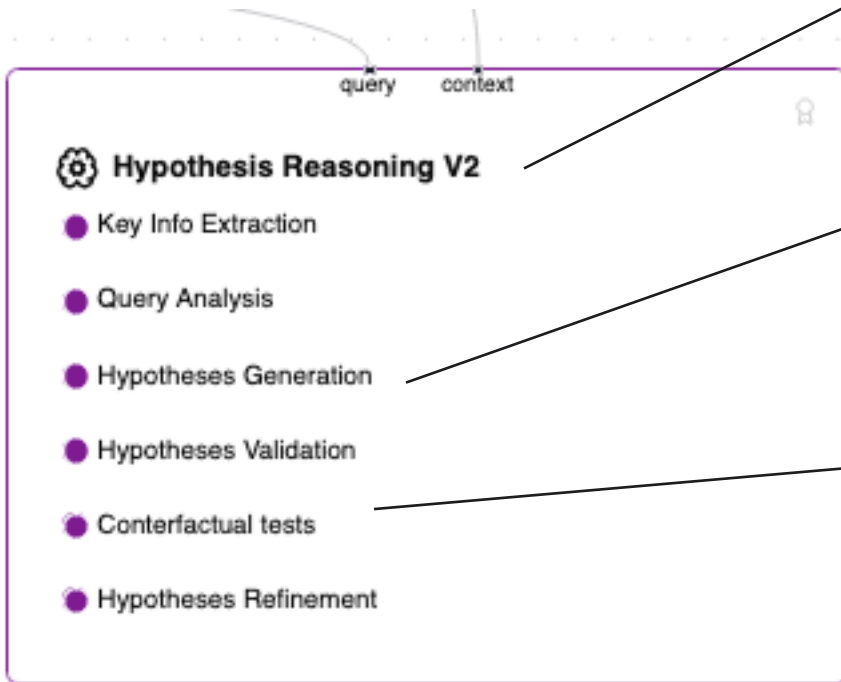
+



Scientific
Knowledge



XAI en action



On n'amène pas un résultat, mais un raisonnement basé sur des données scientifique

Stage : Key Facts & Data Points (Contextual Information):

- **Age:** 50 years old. This places the user in a demographic where age-related musculoskeletal changes become more prevalent.
- **Activity Level:** "Athletic" - participates in indoor sports once a week. This suggests a degree of physical fitness but also potential for overuse injuries or acute trauma related to sports. The *type* of indoor sport is unknown.
- **Height:** 180 cm (approximately 5'11"). This is within a normal range.
- **Weight:** 78 kg (approximately 172 lbs). This yields a BMI of approximately 24.4, classifying the user as having a healthy weight.

Stage : Hypotheses Agent

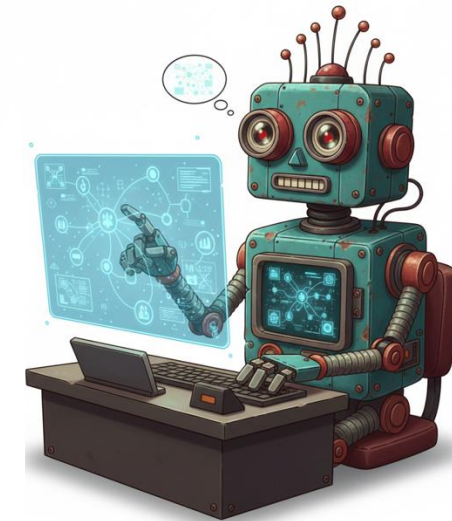
1. **Hypothesis: Lumbar Muscle Strain/Sprain (Most Plausible)**
2. Hypothesis: Disc Degeneration with Acute Exacerbation
3. Hypothesis: Facet Joint Dysfunction
4. Hypothesis: Minor Vertebral Fracture (Compression Fracture)
5. Hypothesis: Sacroiliac Joint Dysfunction
6. ...

Stage : Experimentation Agent

Okay, here are experimental designs for each hypothesis, adhering to the constraints of using only the provided context. I've focused on logical deductions and comparisons within the existing data.

1. Hypothesis: Lumbar Muscle Strain/Sprain

- **Question:** Does the user's description of pain characteristics align with a typical muscle/ligament strain?
- **Methodology:** Compare the user's reported pain characteristics (constant, severe, blocking) against a standard description of muscle/ligament strain pain.
- **Data Points:** User's description of pain ("constant," "completely blocked," "very difficult to get out of bed").
- **Analysis:** Muscle/ligament strains are often described as localized tenderness, pain with movement, and a feeling of stiffness. "Constant" pain can be present, but "completely blocked" and difficulty getting out of bed suggest significant involvement.
- **Confirmation:** If the user confirms localized tenderness upon palpation (if possible to assess remotely), pain worsens with bending/twisting, and there's a feeling of stiffness.
- **Rejection:** If the pain radiates significantly down the leg, is accompanied by numbness/tingling, or is described as sharp and stabbing.
- **Limitations:** No way to assess tenderness or range of motion remotely. Subjective pain descriptions are inherently variable.



Benefits of XAI - eXplainable AI

TRANSPARENCY

The systems must provide evidence or reasons to accompany each decision made.

CONFIDENCE

By explaining its decisions, XAI reinforces user confidence in AI systems, which is essential for their adoption.

RESPONSIBILITY

It encourages responsible decision-making by enabling users to identify and correct potential biases or errors in the models.

ACCESSIBILITY

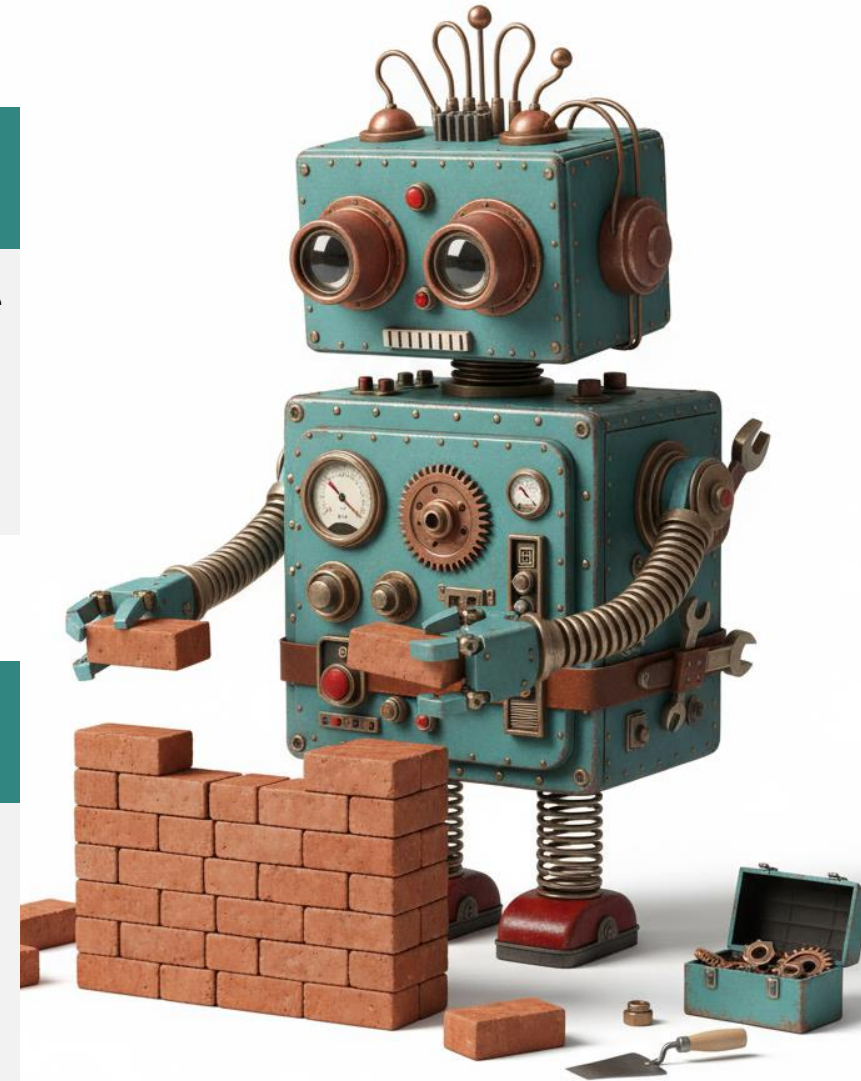
The explanations must be adapted to the context and level of expertise of the users (e.g. doctors, researchers or patients).

KNOWLEDGE

Rather than making people stupid, the XAI provides the building block for reflection to develop knowledge.

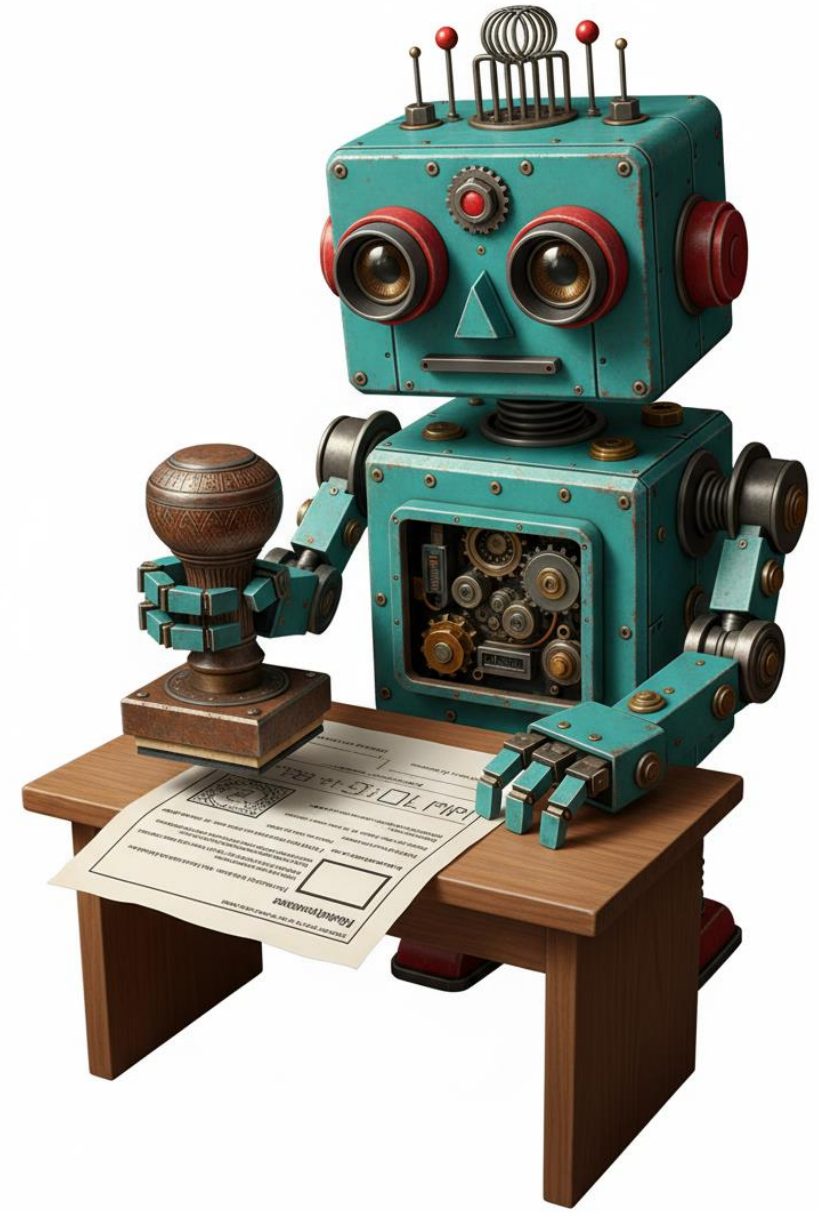
ENERGY-EFFICIENCY

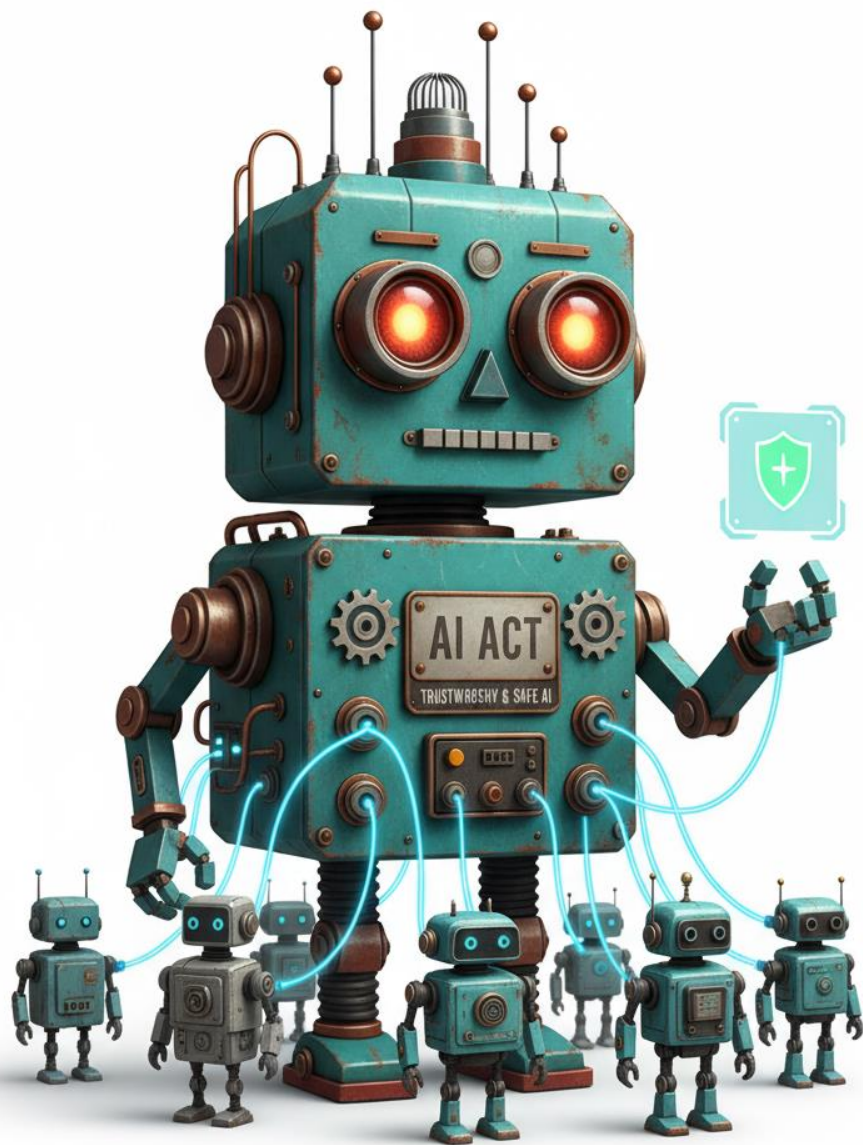
use smaller models adapted to each use case, which consume much less energy



Certification

Avec l'XAI, on peut certifier le raisonnement, l'approche scientifique, même si le savoir évolue !





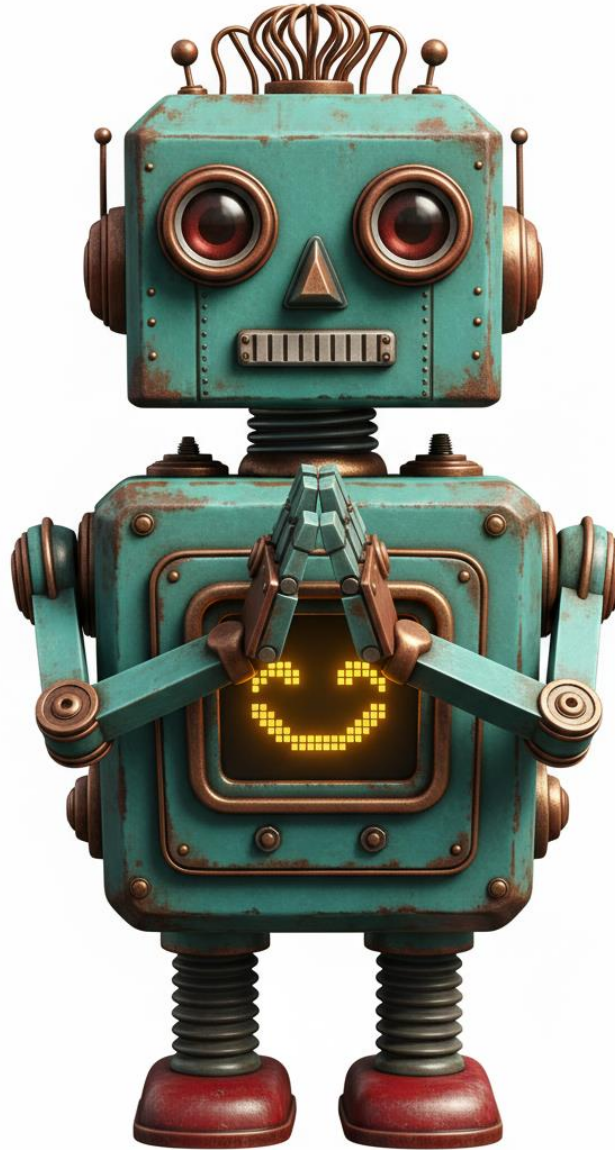
Et l'AI Act ?



Nos convictions

- Oubliez-le « **one-size-fits-all AI** » : Une approche scientifique par use-case
- Lancer des **uses-case précis** avec une **approche algorithmique**, et valider leur pertinence
- La **validation par le raisonnement est accessible !**

Thank You



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