INTERNATIONAL RAILWAY SAFETY COUNCIL 2022

IRSC Spain

# IRSC 2022

INTERNATIONAL RAILWAY
SAFETY COUNCIL

**SEVILLA, OCTOBER 16-21, 2022**

epsf
établissement public de sécurité ferroviaire

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AESF AGENCIA ESTATAL DE SEGURIDAD FERROVIARIA

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# MACHINE LEARNING ALGORITHM IN RAILWAY SAFETY CRITICAL APPLICATIONS : A NSA PERSPECTIVE

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# AUTOMATIC METRO VS AUTONOMOUS TRAIN, WHAT IS SO SPECIFIC WITH MACHINE LEARNING ALGORITHM ?

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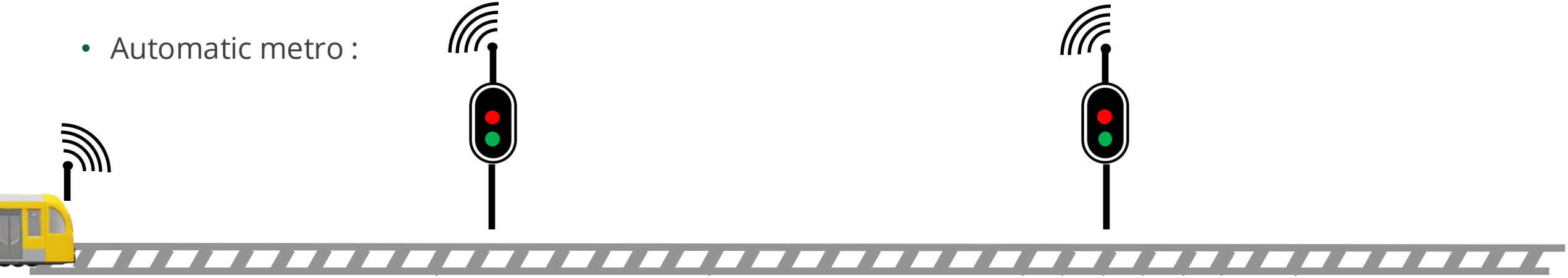
# Automatic metro vs autonomous train – What is the difference ?

- Automatic metro :

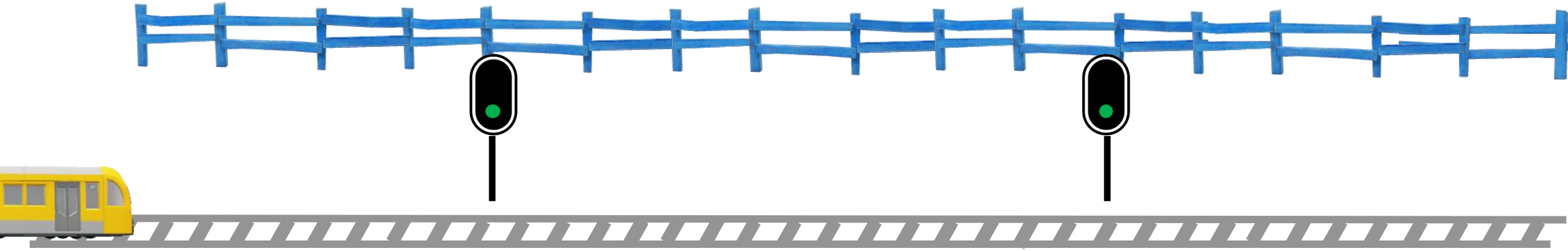
- Autonomous train :

# Automatic metro vs autonomous train – What is the difference ?

- Automatic metro :



- Autonomous train :



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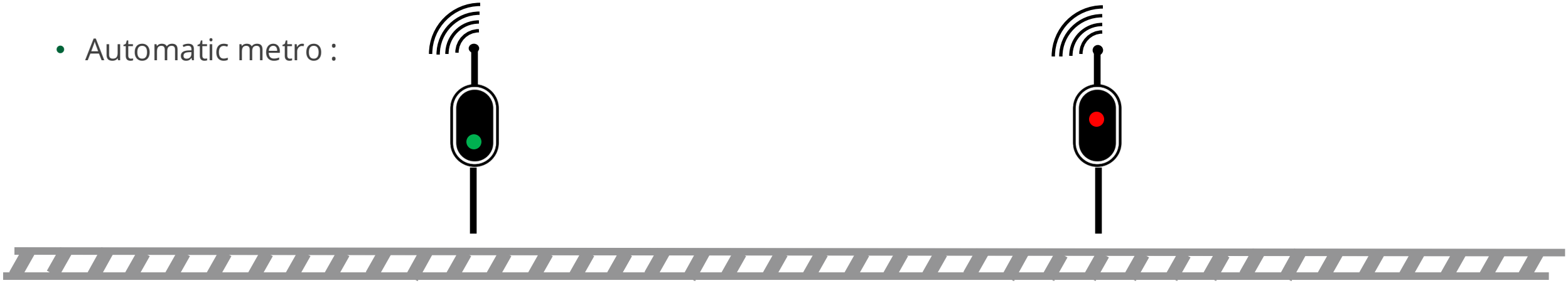
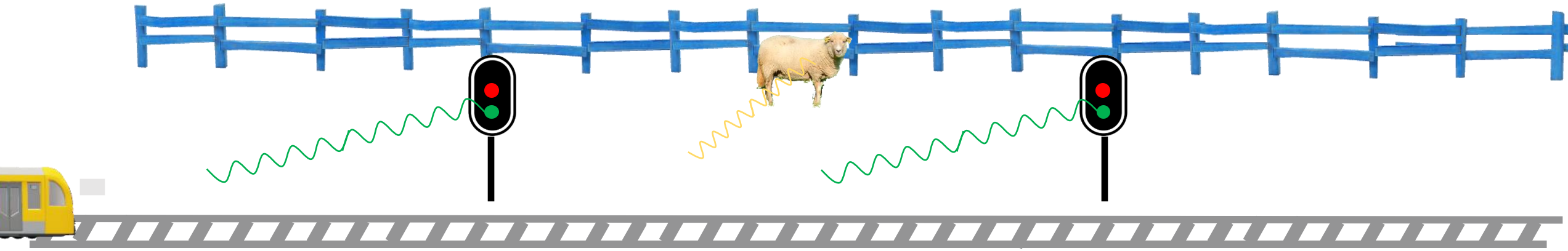


- Autonomous train :



# AI and ML, what are we talking about exactly ?

- What is artificial intelligence (AI) ?

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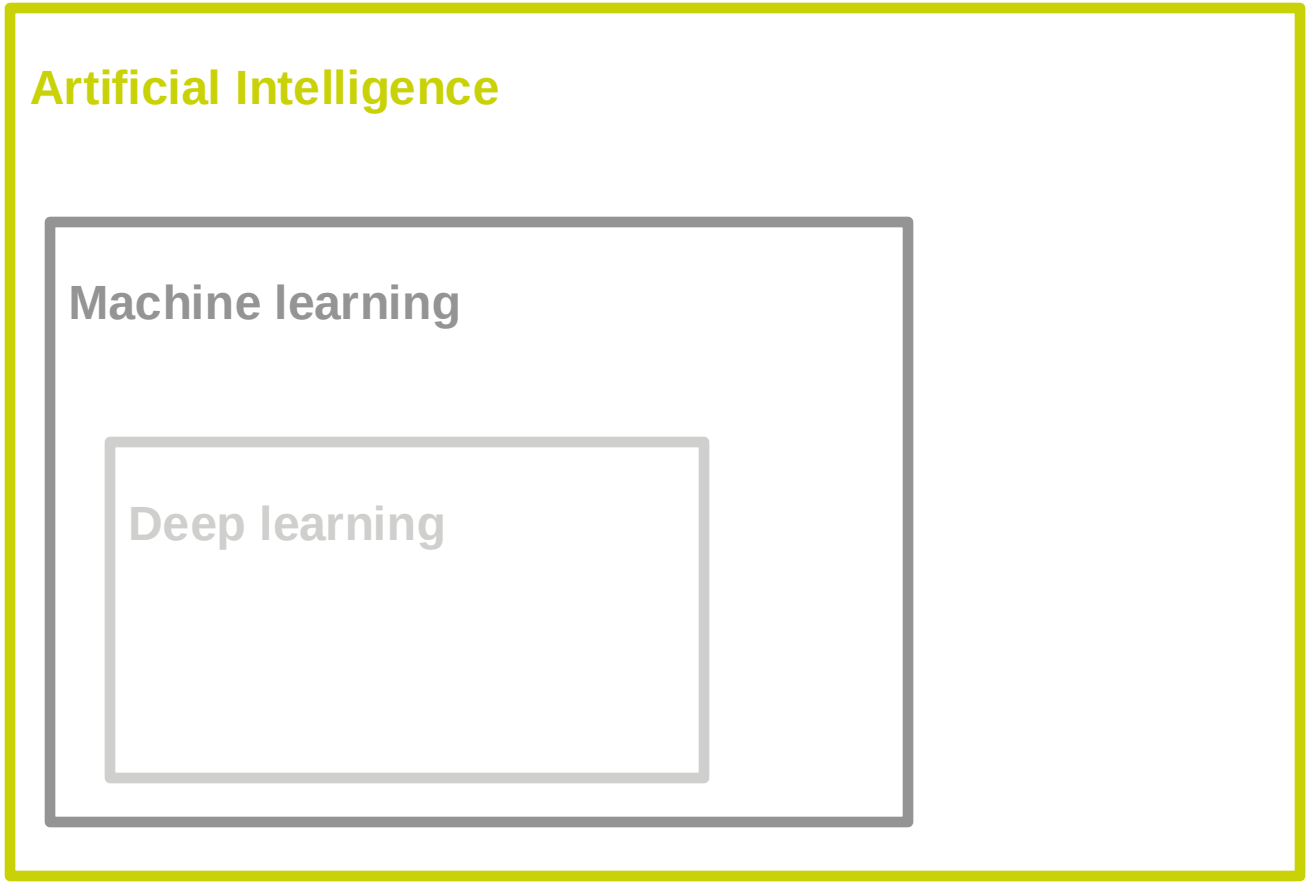
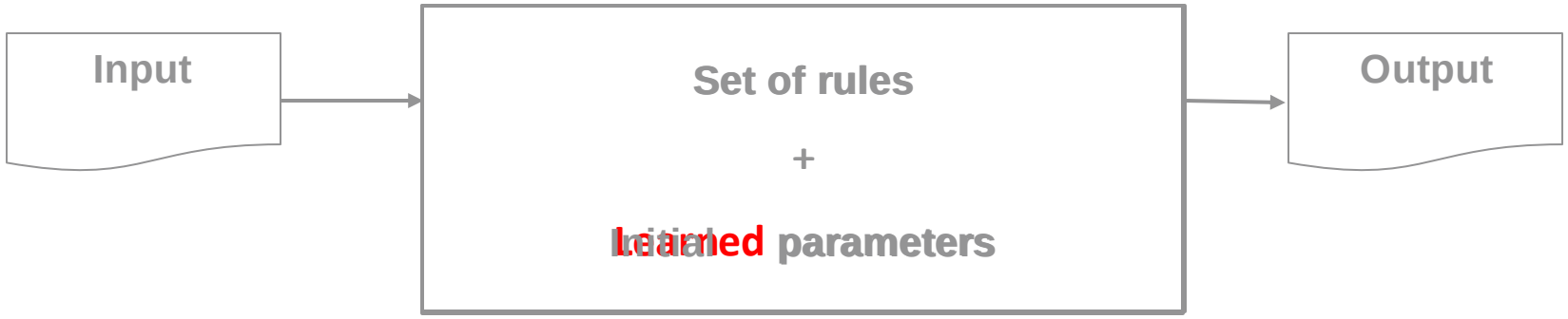
- What is artificial intelligence (AI) ?
- What is machine learning (ML) ?



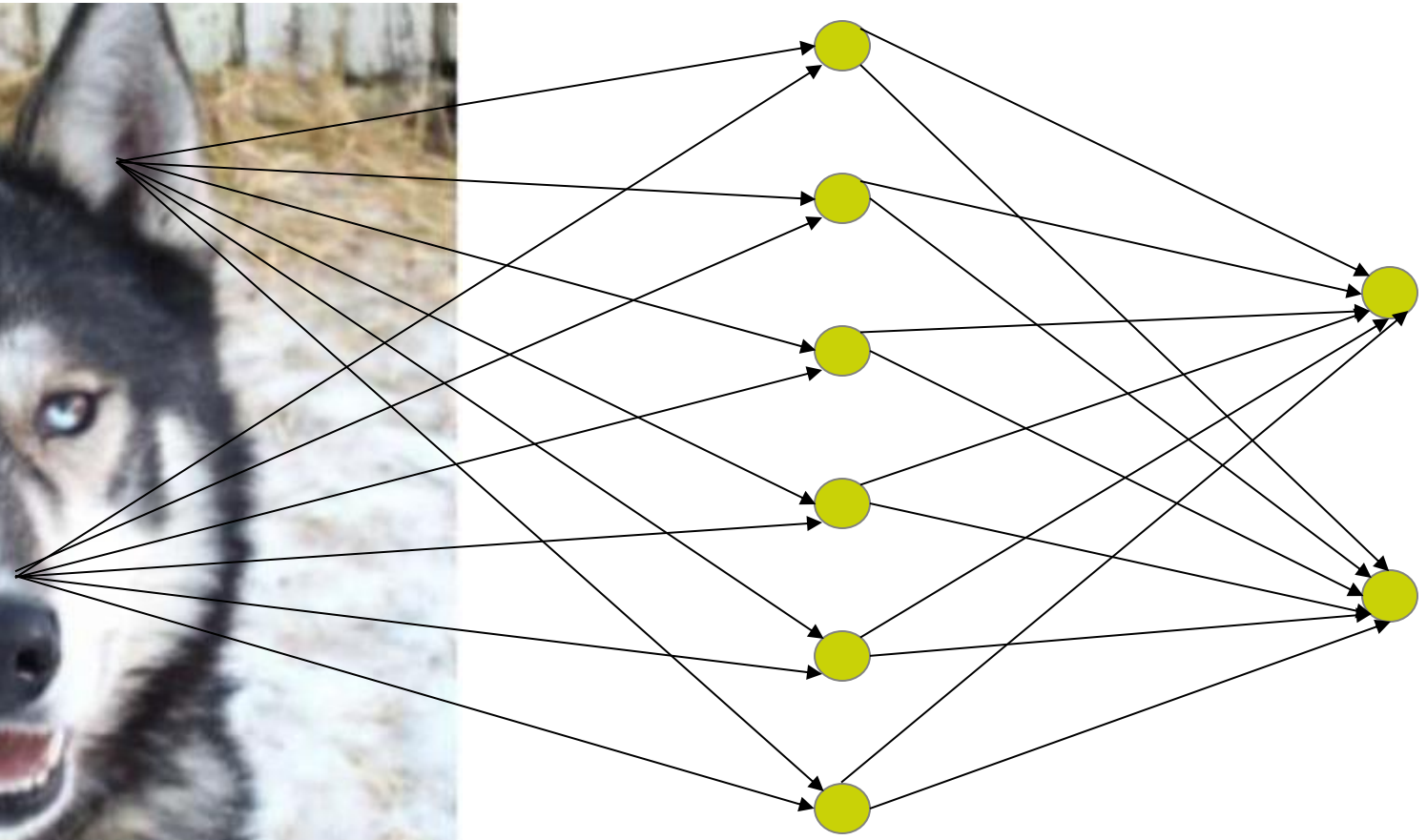
# What is so specific with ML ?

- “Classic” algorithm:

- Machine learning algorithm:



# What is so specific with ML ?



Husky

Wolf

# DEMONSTRATING SAFETY, THE HOLISTIC APPROACH OF RAILWAY

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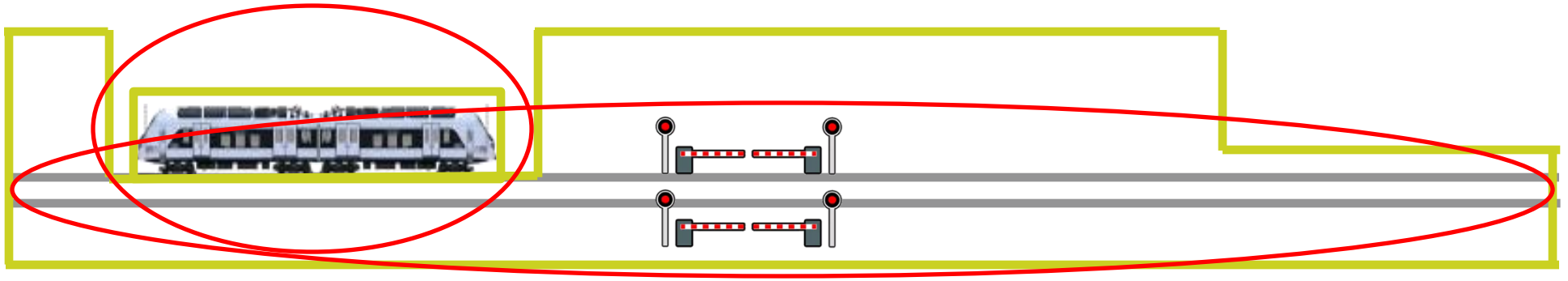
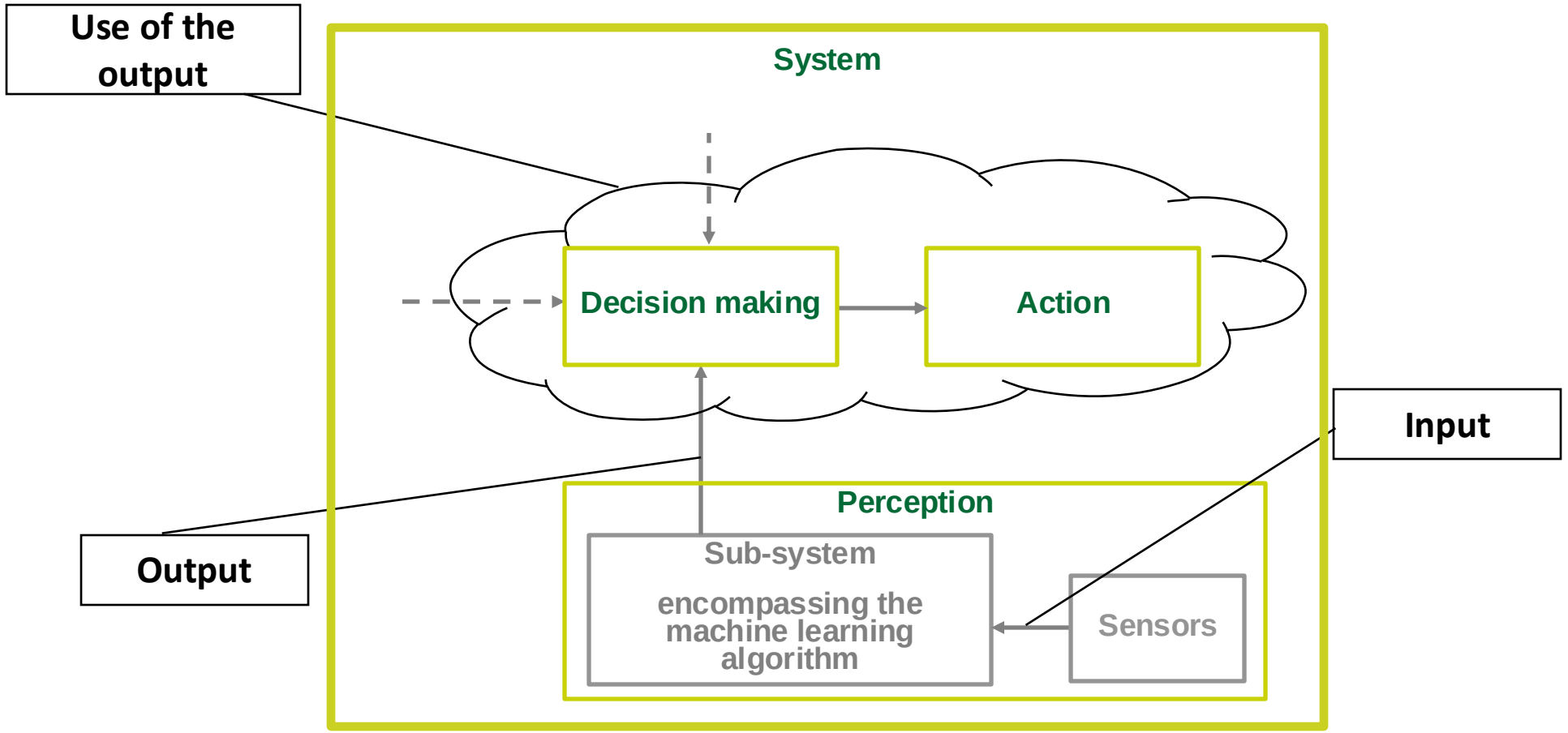
# Authorization within the european interoperable regulatory framework

- Technical systems :
  - Fixed installations ;
  - Vehicle ;
- Entities (safety management system – SMS) ;
  - Railway undertaking ;
  - Infrastructure manager ;



# A holistic approach



# CHALLENGES AND ISSUES AHEAD

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# Three main challenges

**Certifiable**

**Auditable**

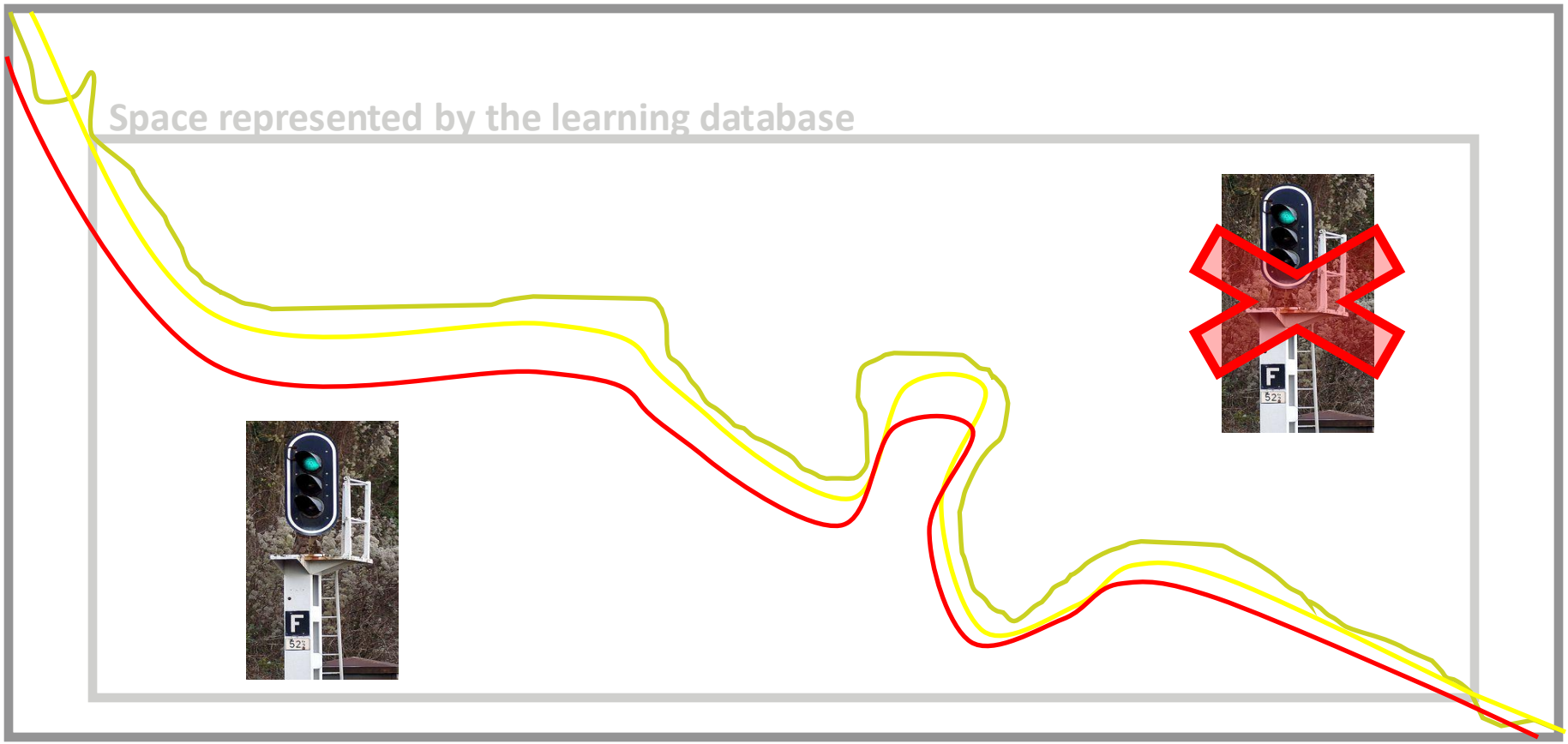
**Reproducible**

# Three main challenges

**Certifiable**

**Accuracy**

Space of the area of use



# Three main challenges

**Certifiable**

**Over time**

1977

2022

Tomorrow ?

# Three main challenges

**Certifiable**

**Auditable**

**Reproducible**

# Three main challenges

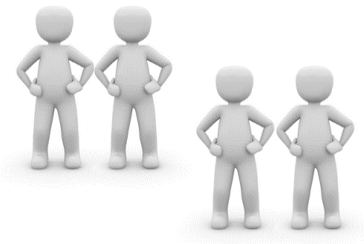
Auditable

Explainability

Operator using a tool working with ML

Immediate accident analysis

In-depth accident analysis



Time

# Three main challenges

**Certifiable**

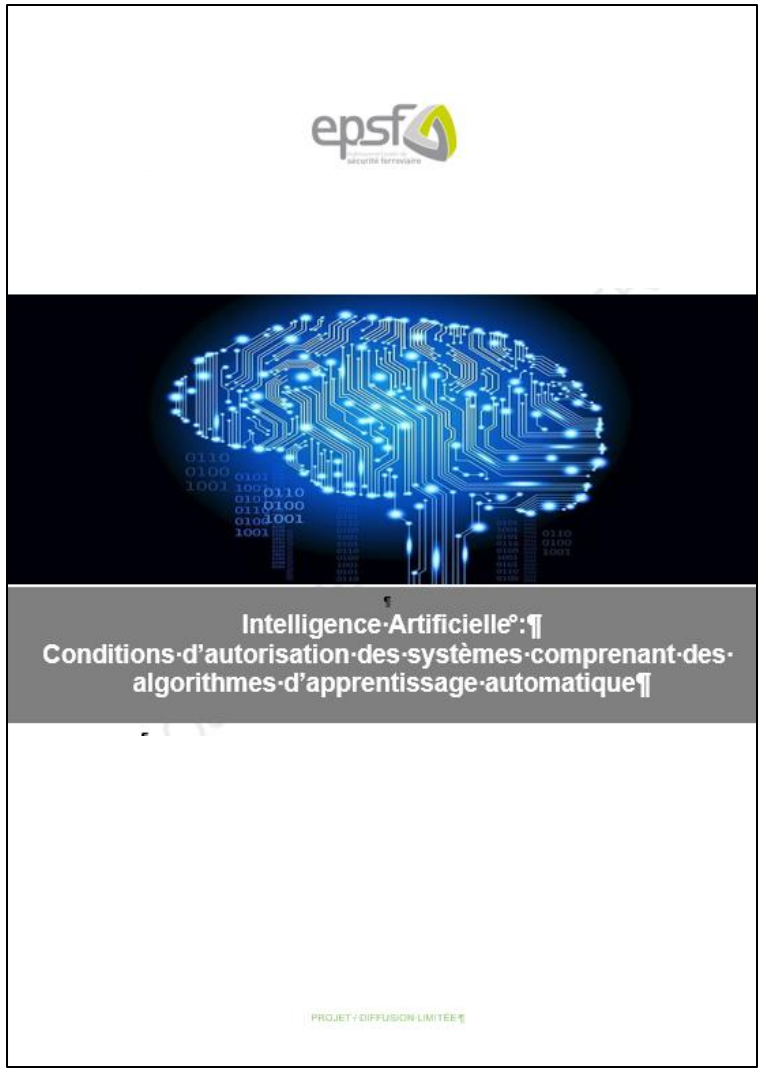
**Auditable**

**Reproducible**

# Three main challenges

Reproducible

# Position paper…coming soon…



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