



**IMT Atlantique**

Bretagne-Pays de la Loire

École Mines-Télécom

**Project TwinCoBot  
Gaëlic BECHU**

**IMT Atlantique : Equipes P4S/RAMBO  
IMT Mine Alès : Equipe MIB**

# Introduction

## Project TwinCoBot :

- Objectives of the project
- Members of the project
- What is a Digital Twin
- Implementations
- Conclusion



# Objectives of the project

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End Goal : create a digital twin of human robot interaction

To understand the creation method of a digital twin and develop a generalized architecture on the subject :

- Methodology / a Know-how

To create a digital twin of a human robot interaction :

- Generate a database
- Factory of the future

## Software Architecture team:

- Brest team : Caroline CAO, Antoine BEUGNARD, Gaëlic BECHU
- Alès team : Christelle URTADO, Sylvain VAUTTIER, Quentin PEREZ

## Industry of the future team:

- Caroline CAO, Panagiotis PAPADAKIS, Christophe LOHR, Alireza ASVADI, Gaëlic BECHU

# What is a Digital Twin

## Understanding

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**Physical Model:** The physical representation of an object.

- Expl : a human, a robot, the sun

**Simulated Model:** The simulation of the physical representation.

- Expl : geometrical, data

**Digital Shadow:** The physical device updates it's development in real time in the simulation.

- Expl : Stream data

**Digital Twin:** The simulated model influences the physical device.

- Expl : predict the human behaviour in a factory.

# Implementations Completed

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## Physical Model:

- 4 dof Kinova J2n4s300
- ROS NOETIC
- Moveit

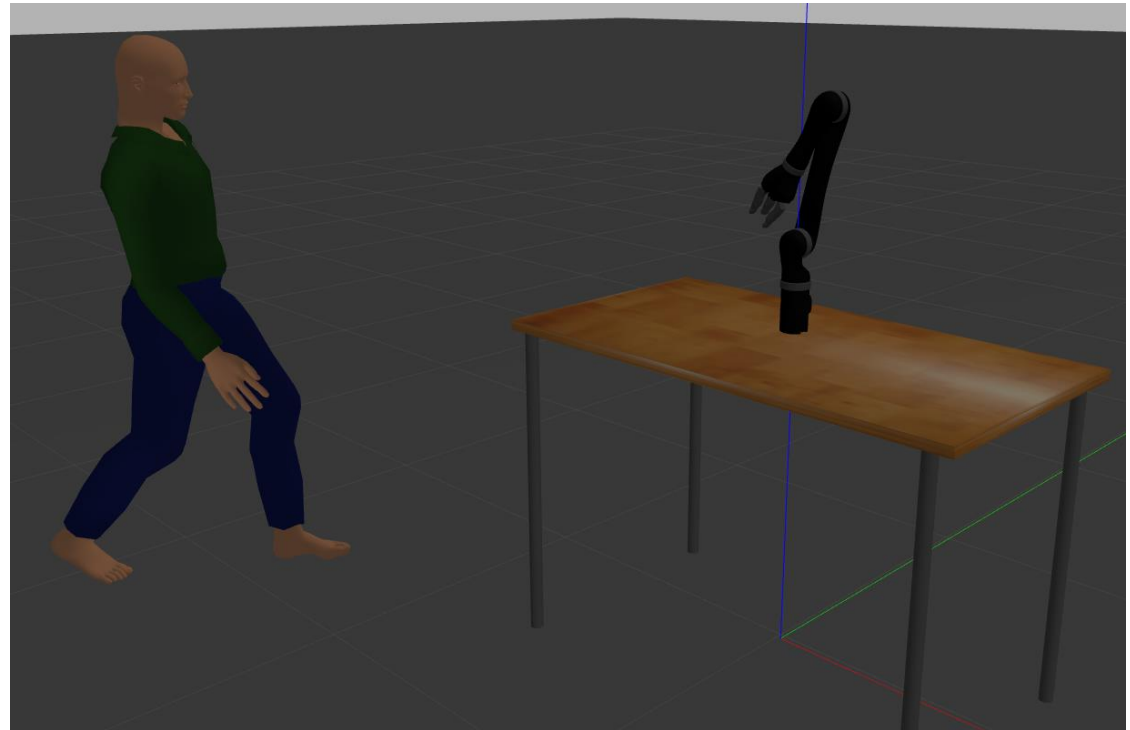


# Implementations Completed

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## Simulated Model:

- Gazebo
- Unity3d

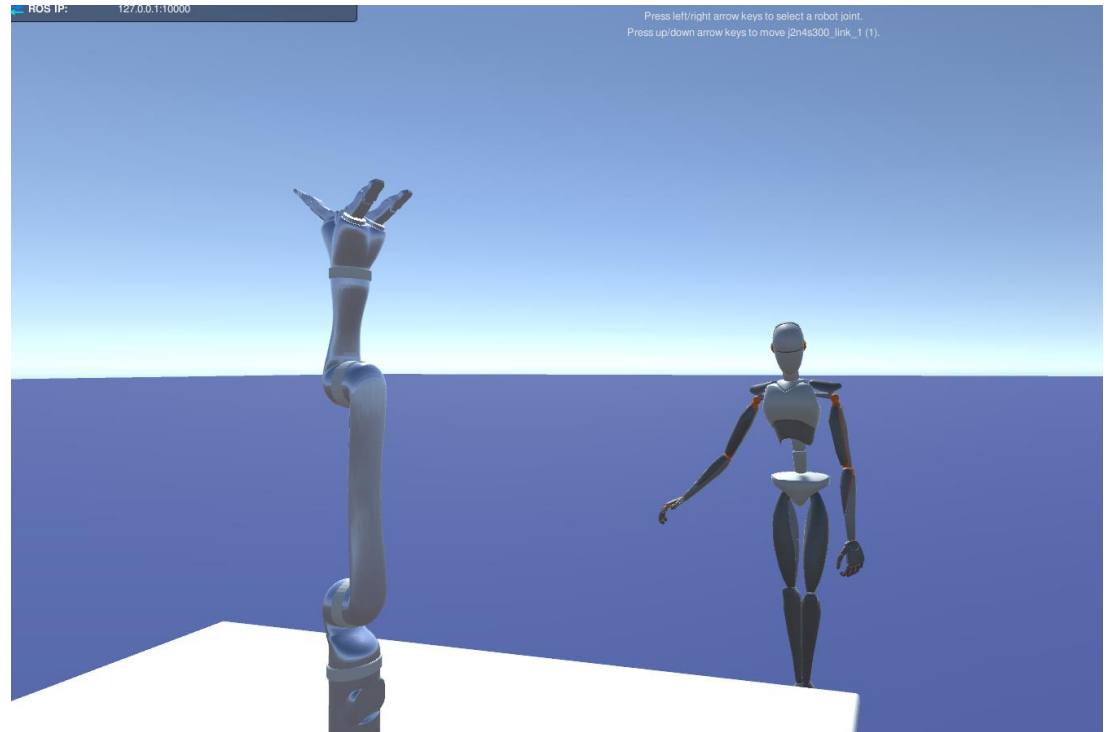


# Implementations Completed

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## Simulated Model:

- Gazebo
- Unity3d

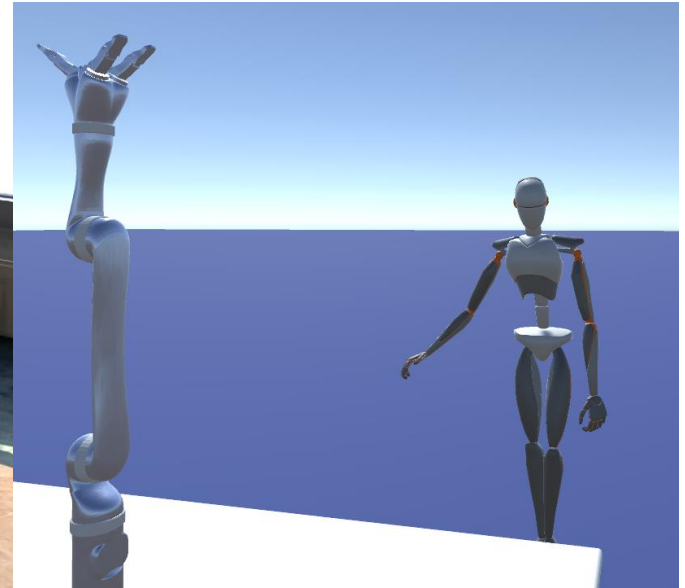


# Implementations In Construction

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## Digital Shadow:

- Xsens
- ROS Unity Connection

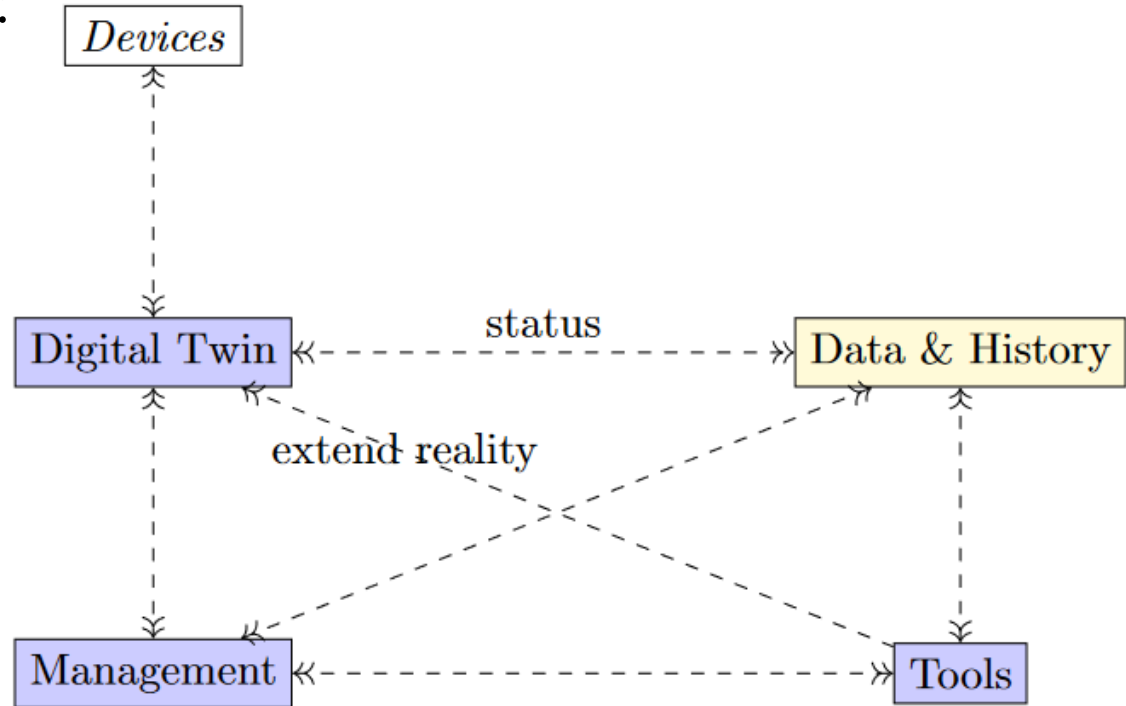


# Implementations

## Architecture : Simplified

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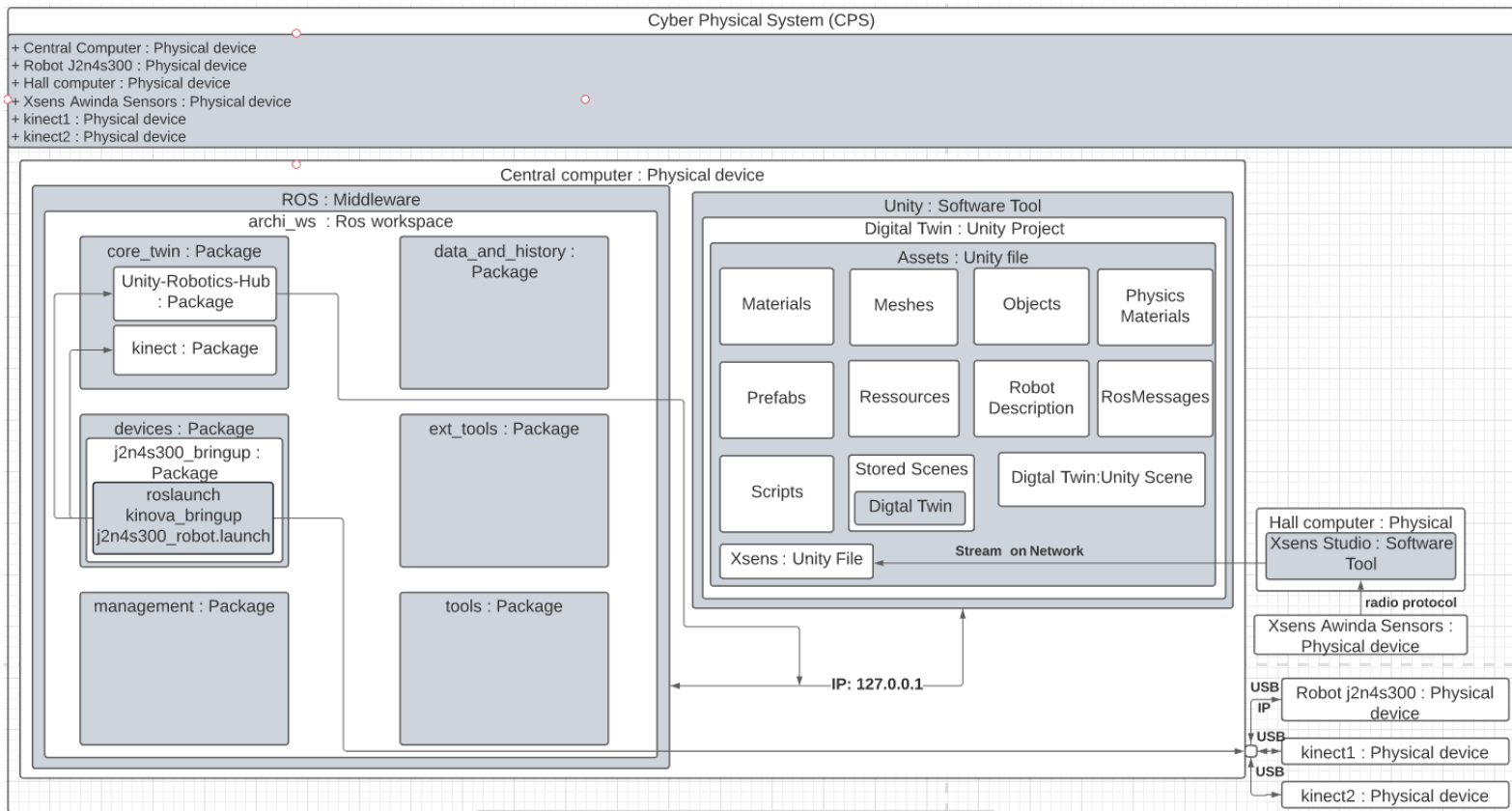
Simplified Architecture:



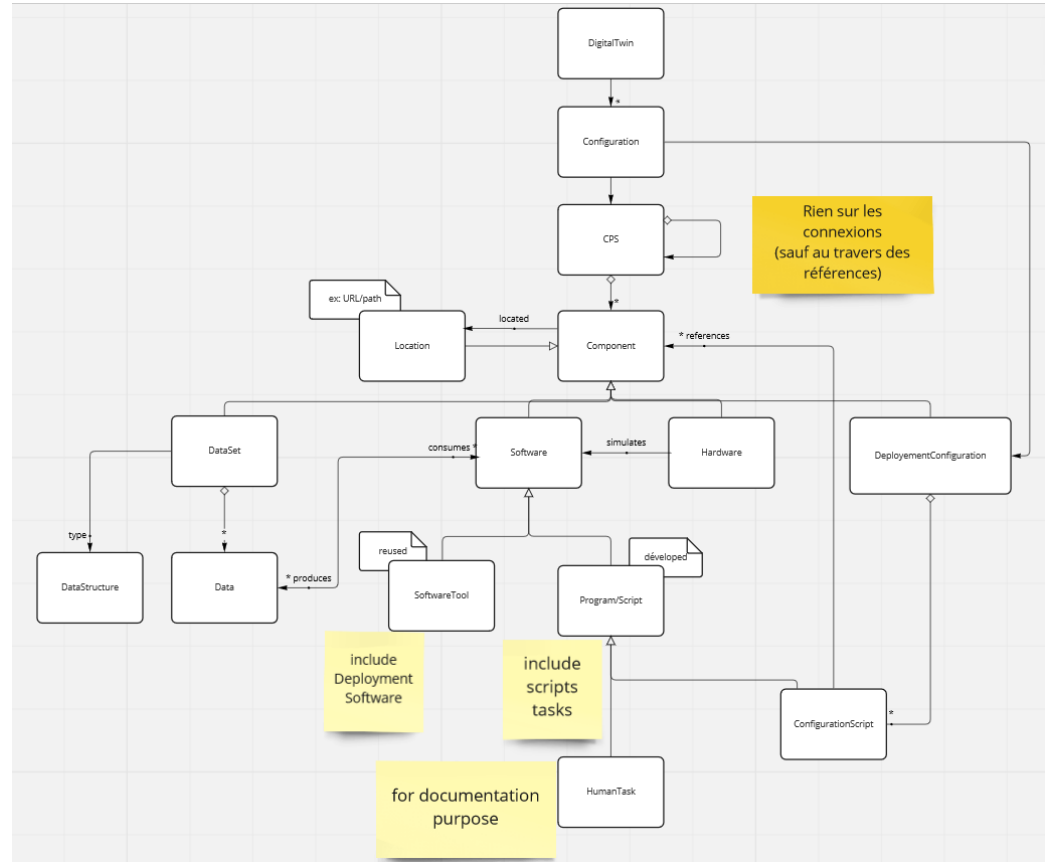
# Implementations

## Architecture : Composite Diagramm

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### Ontologie Diagramm:



Research paper that we plan to submit for selection at the beginning of May for the architecture of the digital twin:

- International Conference on Human-Computer Interaction

**Thank you for your attention!**



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