

Internship proposal for 2nd year Master's students  
Industrial Engineering major

**Earliest start possible**

**Internship title:** Digital twin of an assembly workshop

**Laboratory:** G-SCOP

**Internship supervisor(s):**

DAVID, Pierre [pierre.david@grenoble-inp.fr](mailto:pierre.david@grenoble-inp.fr)

RIFI, Leah [leah.rifi@grenoble-inp.fr](mailto:leah.rifi@grenoble-inp.fr)

FARHAT, Nessrine [nessrine.farhat@grenoble-inp.fr](mailto:nessrine.farhat@grenoble-inp.fr)

**Subject description:**

The objective of the internship is to develop a digital twin-based decision support system for activity planning in an assembly workshop.

Your objective will be to (1) build a simulation model of the assembly workshop, (2) construct alternative production planning scenarios, and (3) connect your tool to an online platform providing access to real-time information about the workshop.

Work will be carried out to feed field data into the simulation model, which will be used to make decisions about workshop operations. The decisions to be made and fed back into the real system will be of various types:

- Supplying workstations
- Recalculation of scheduling
- Assigning operators to workstations

In concrete terms, the twin will be built to reflect the activities of a simulated tidal turbine assembly workshop under real conditions on the S.mart Grenoble Alpes "Operations Management" platform and made available to G-SCOP. The simulation model will be created using a discrete event modeling and simulation tool: Flexsim or Python (Sumpy library).

Figure 1 describes how the final tool works. First, the operator performs tasks in the assembly workshop. Sensors record videos in real time, extract information from the images (e.g., number of finished products on the workbench), and deduce the state of the system. The information is sent to the simulation model, which is initialized to correspond to the current state of the system. Various "what-if" scenarios are run in the model (e.g., scheduling strategies), and a decision is made as to which one to follow. The description of the strategy to follow is transmitted to the operator.

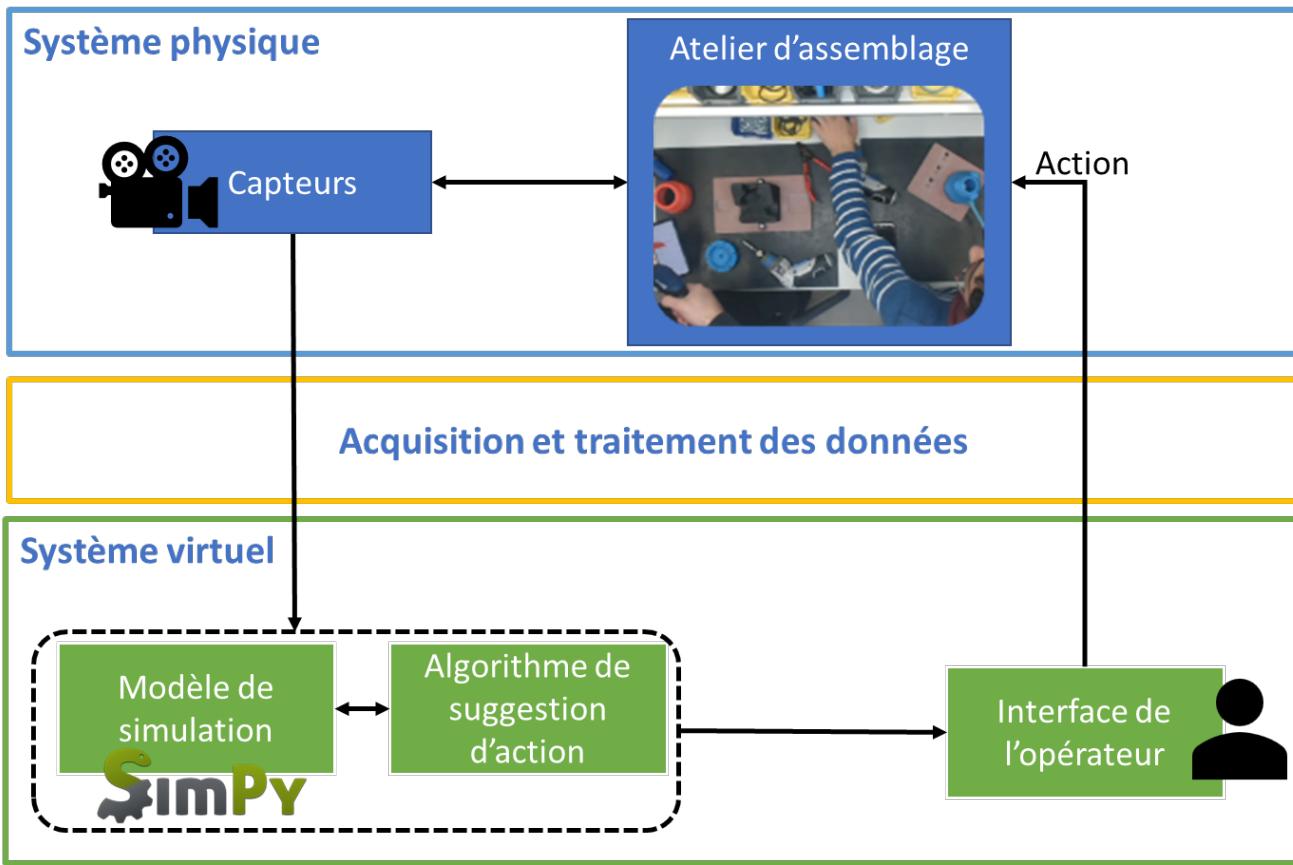


Figure 1 - Overview of the digital twin-based decision support tool for assembly workshops

**Prerequisites - Desired knowledge:**

- Discrete event simulation (preferably Flexsim).
- Concept of production management
- Discrete event models
- Optimization model/decision support
- Industrial IT