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Thesis: Data-Based Inference of Simulation Model - (Application to Digital Twin Engineering)

ACT Project Context:

The ACT project (Une université Augmentée pour un Campus et un monde en Transition) is a key enabler for UB to develop as a responsible public institution, capable of producing and transmitting complex usable knowledge. So that the socio-environmental transition needs can be achieved. The ACT project is built around four key mission objectives (KMO), which are the following:

1. Engaging communities in projects to solve effective transition issues on campus,
2. Developing provision of research for evidence-based decision-making,
3. Providing training for leaders to act in complex situations,
4. Providing expertise to solve large-scale transition issues with international communities.

Context of Ph.D. Thesis:

This PhD thesis titled as “Data-Base Inference of Simulation Model (Application to Digital Engineering)” is a sub-topic of the ACT project. In order “to solve effective transition issues on campus” KMO1-ACT, and for the “evidence-based decision making” KMO2-ACT there is a need of a scientific tool. In order to address these issues the UB decided to put in place a Digital Twin (DT) based tool that would help in the future to understand those transitions under the objectives of ACT project.

“*The Digital Twin of the University of Bordeaux, whose development is the subject of this thesis, aims at establishing in a first phase a digital twin of smart mobility on the Campus, then in a second phase at identifying, prioritizing and integrating the other dimensions (energy, health, safety, waste, etc.), with the eventual objective of replicating the approach on the scale of the Metropolis of Bordeaux.*” The deployment of a digital twin, its interoperability and complexity will scale up over the course of the projects developed in ACT: from initial design to a fully integrated and interoperable digital and physical campus.

This PhD thesis aims *to provide a tool on Digital Twin for campus with some defined capabilities*, where one can analyze and visualize the possible transition on the basis of input data and how the campus respond to those input data and also to identify the bottle necks and provide recommendations for the improvements. Figure 1. Gives the general overview of this thesis.

