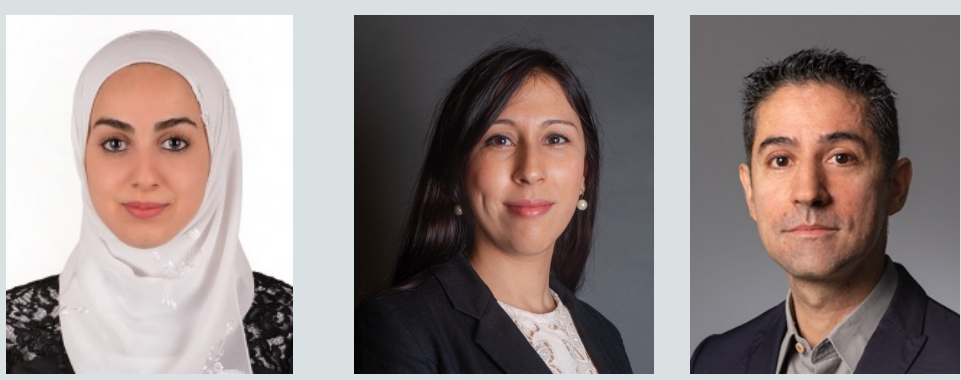




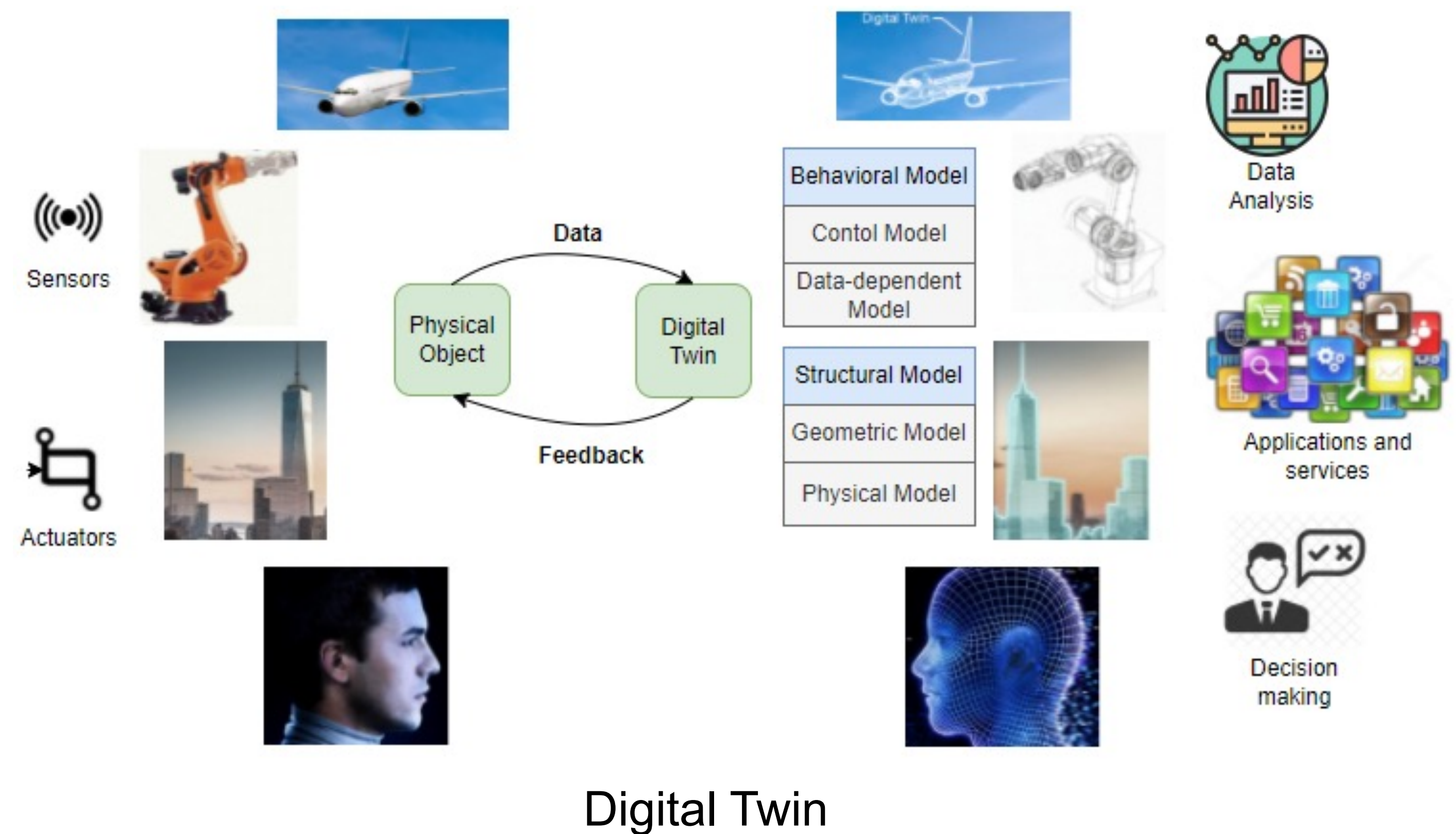
Authors

Zeinab RAHAL
Mariana SEGOVIA
Joaquín GARCIA-ALFARO



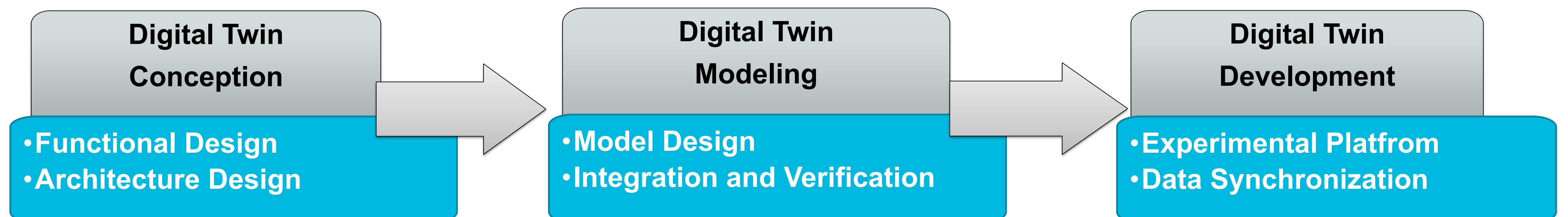
What is a Digital Twin (DT)?

- ▶ A DT is a software representation of a physical system.
- ▶ It uses models to reproduce its structure, behavior and conditions.
- ▶ DT can be used to design, develop, simulate, monitor, control and optimize the real system.
- ▶ It is composed of three main components
 - **Physical Object**
 - **Virtual Object**
 - **Data Synchronization**

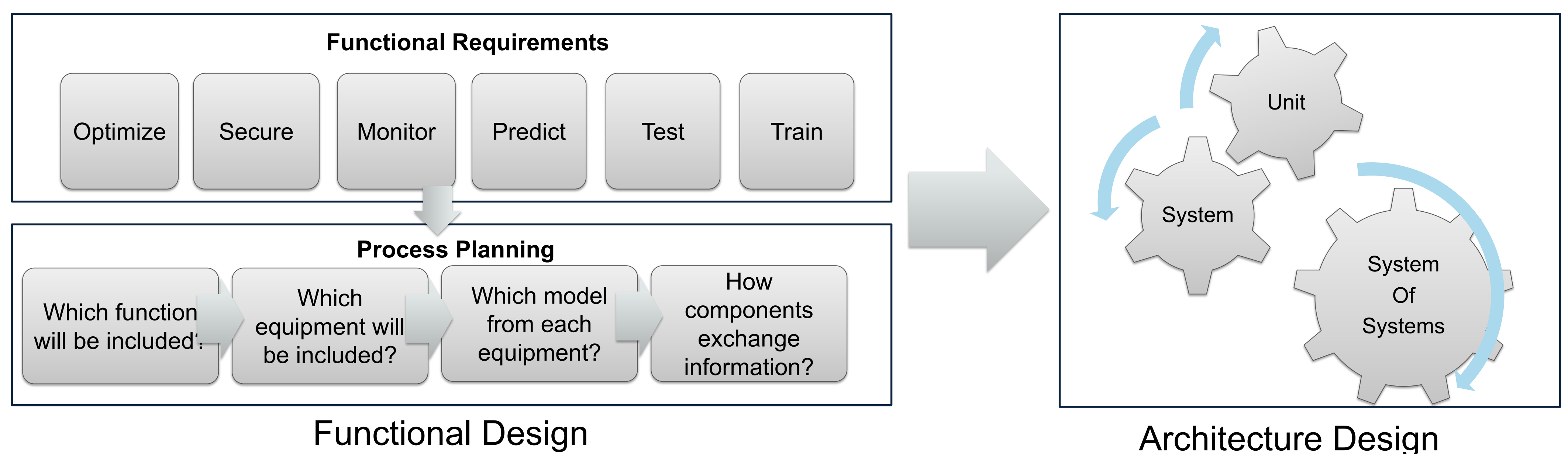


A Survey to Implement DT

Implementation Techniques and Procedures



Conception



Modeling

Physics-based


Mathematical models based on the laws of physic

$$x_{k+1} = Ax_k + Bu_k + w_k$$

$$y_k = Cx_k + v_k$$

Data-based

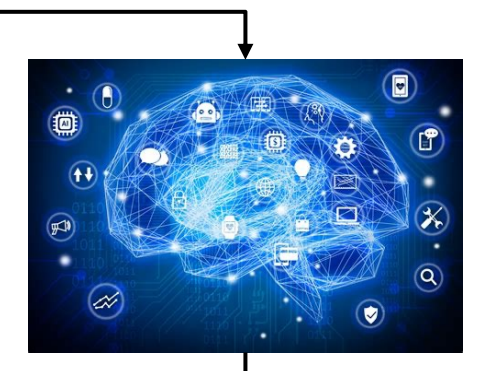
Artificial Intelligence algorithms to create a model



Hybrid

Combines Physics and Data-based approaches

$$x_{k+1} = Ax_k + Bu_k + w_k$$

$$y_k = Cx_k + v_k$$


Development

