BUILDING A DIGITAL TWIN FOR THE DESKTOP ROBOTTI

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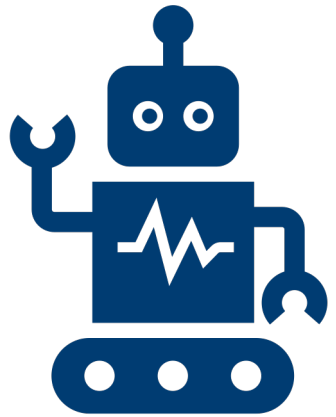
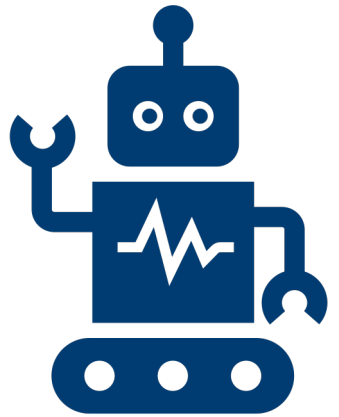
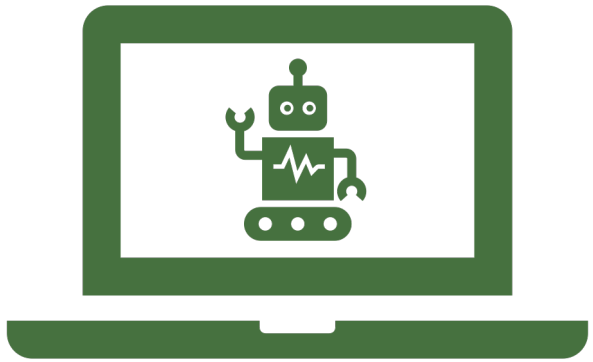
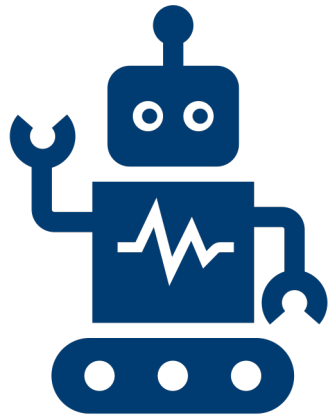
R-Day, October 2023

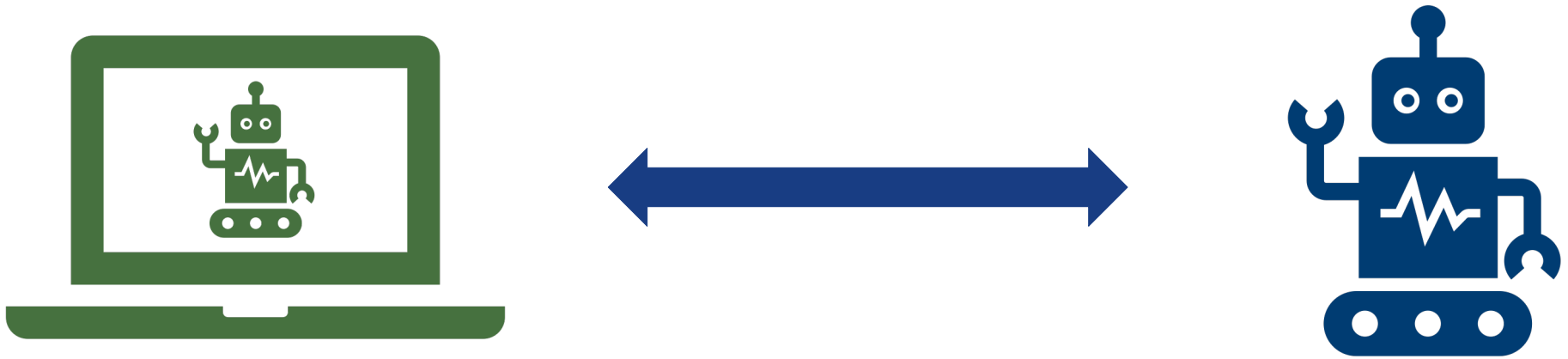
WHAT'S A DIGITAL TWIN?



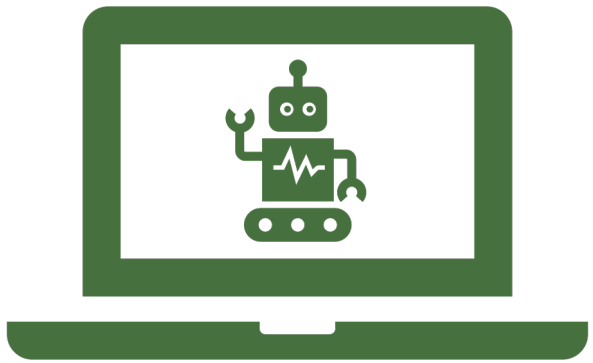


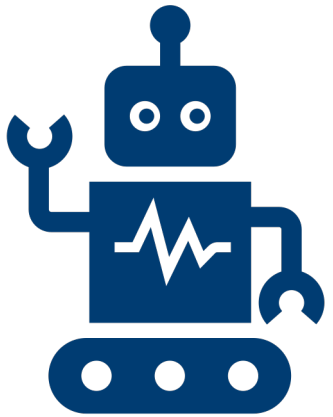


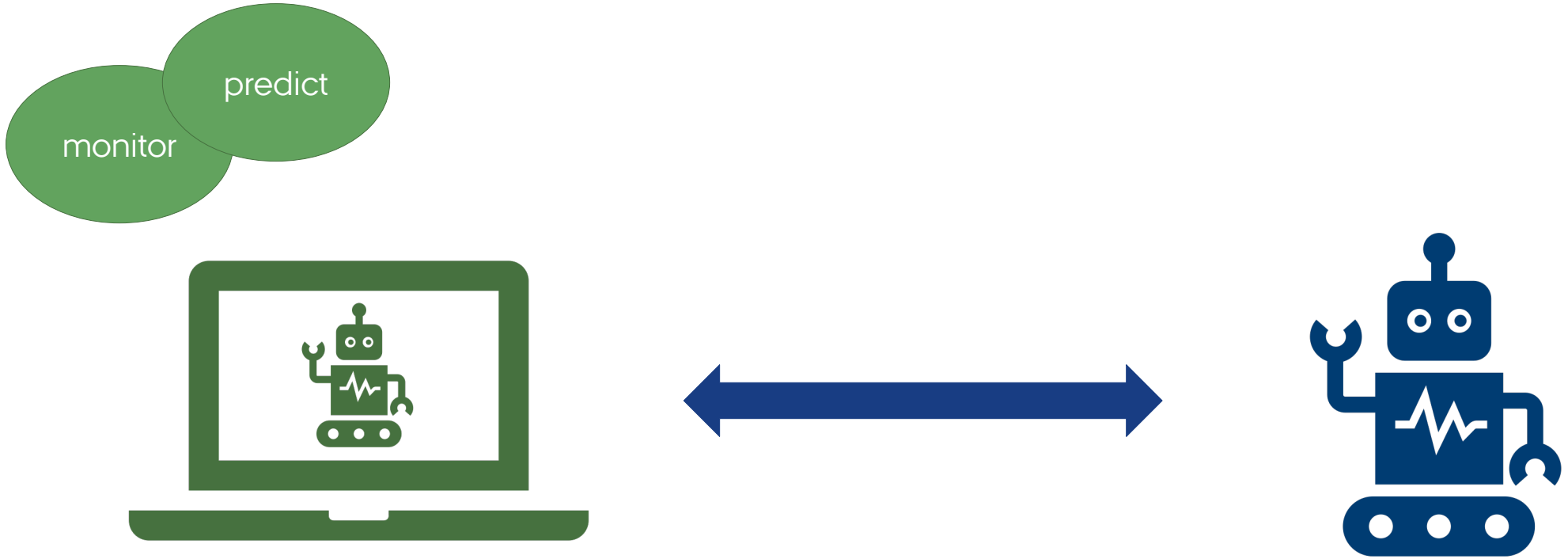


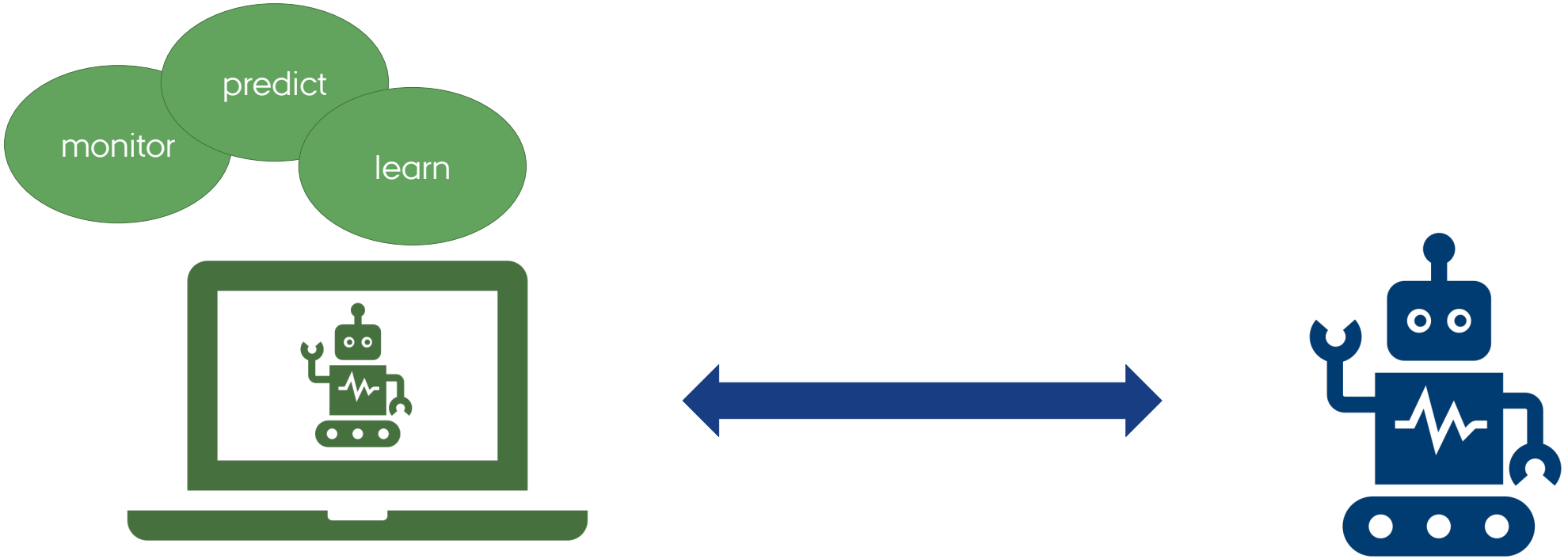


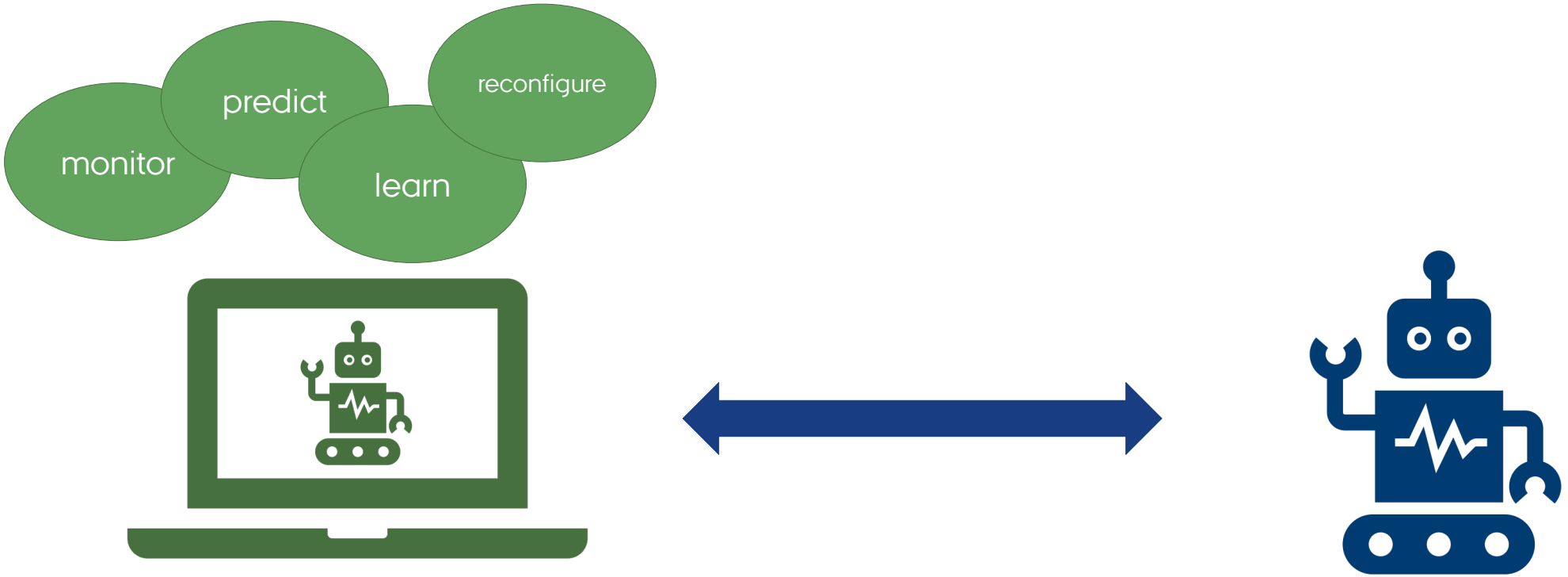
monitor

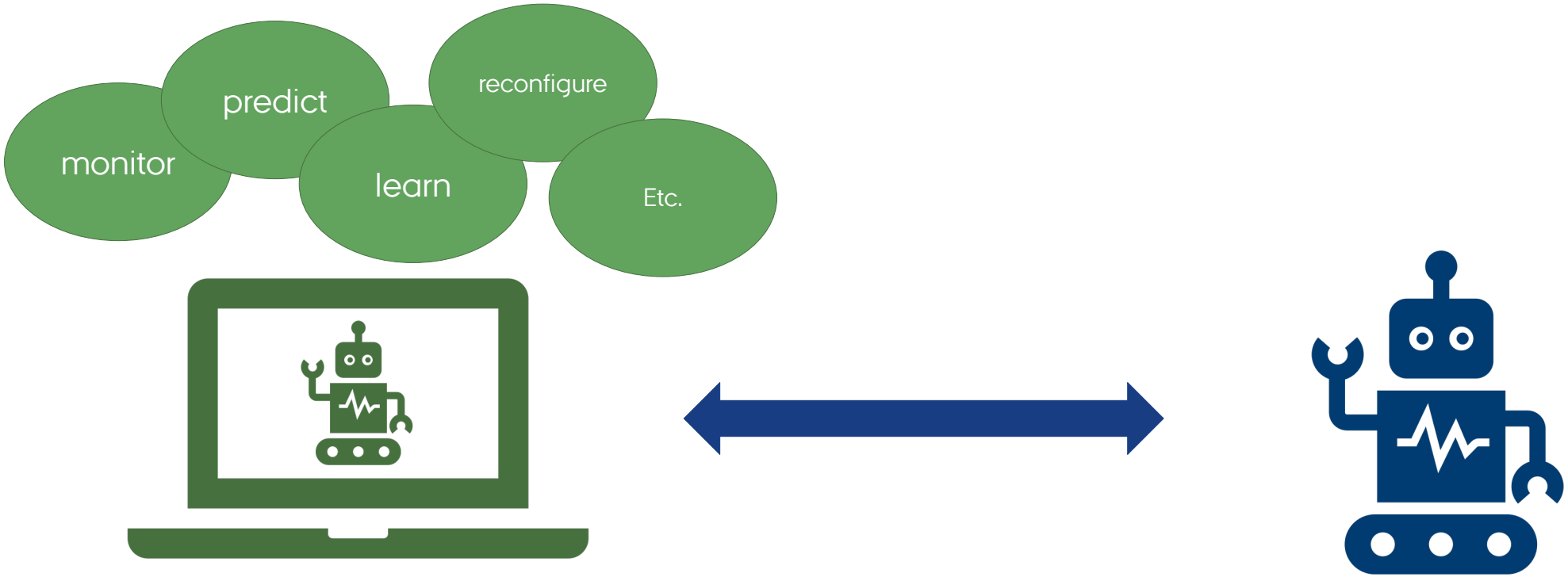





predict
monitor

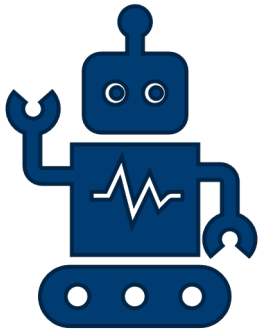

predict
monitor
learn


monitor
predict
learn
reconfigure


monitor
predict
learn
reconfigure
Etc.

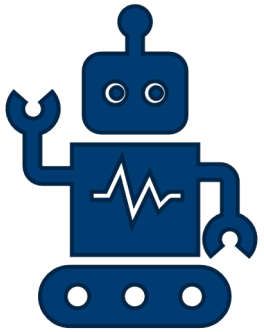
SIMULATION &CO-SIMULATION

SIMULATION



SIMULATION

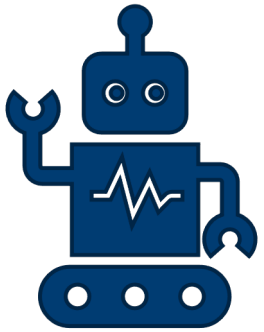
Kinematics Model



SIMULATION

Kinematics Model

Actuation

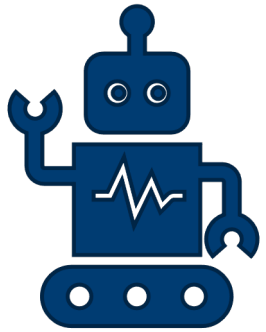


SIMULATION

Kinematics Model

Actuation

Mechanical

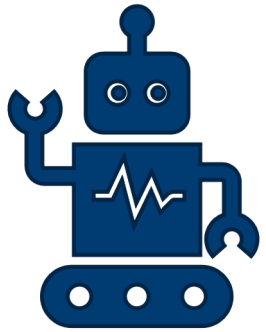


SIMULATION

Kinematics Model

Actuation

Mechanical

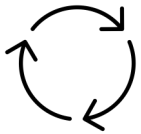


Environment

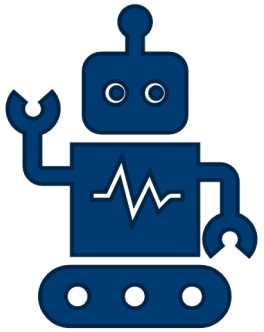
CO-SIMULATION

Kinematics Model

Actuation



Mechanical



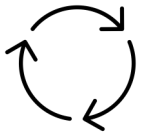
Environment

CO-SIMULATION

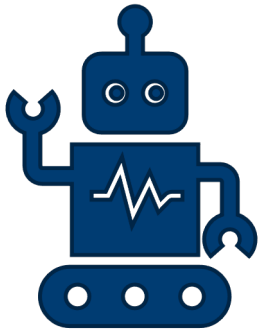
FMI Standard

Kinematics Model

Actuation



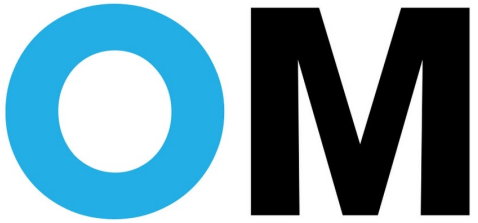
Mechanical



Environment

CO-SIMULATION

FMI Standard



THE ROBOT

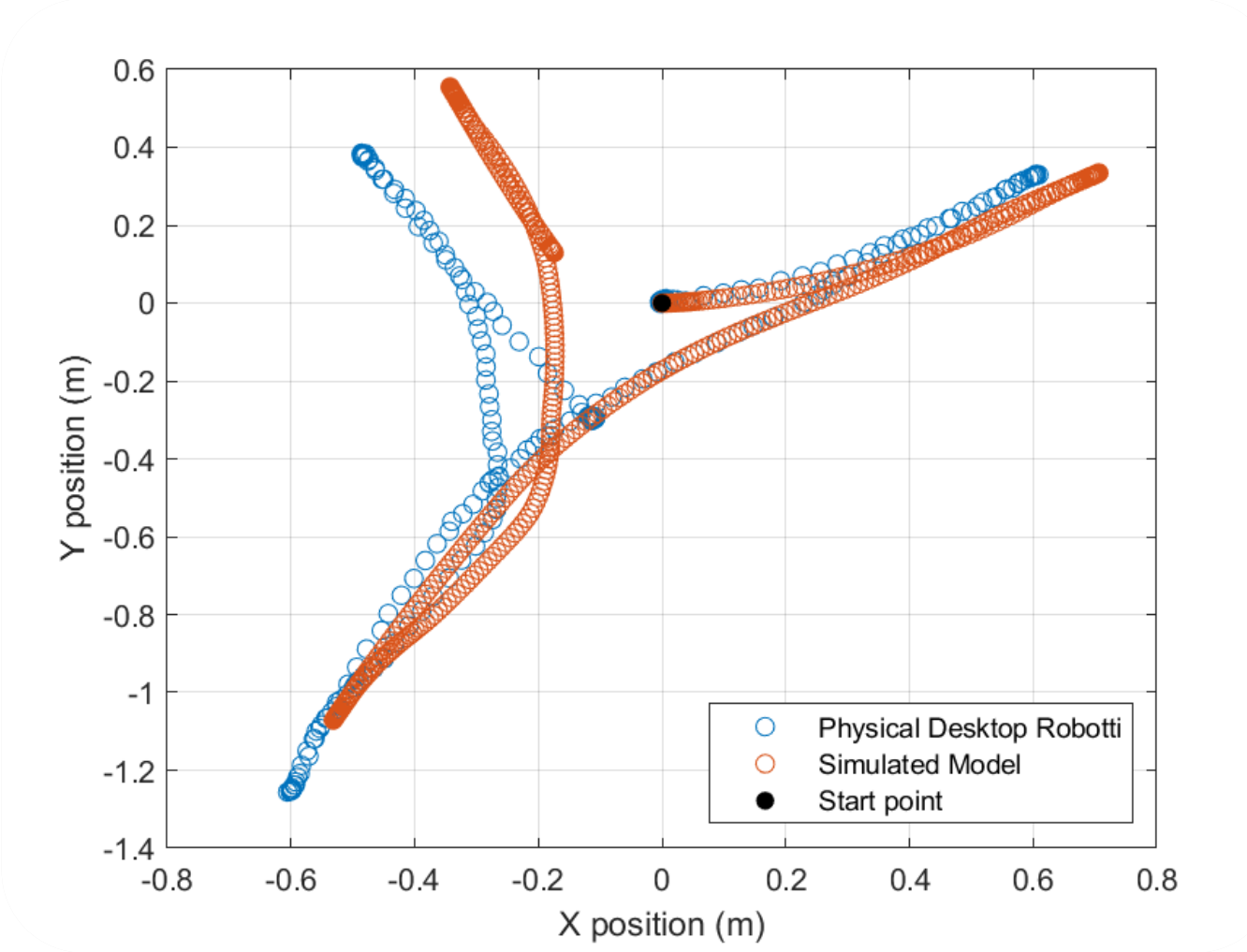
THE ROBOT

THE ROBOT

SO FAR

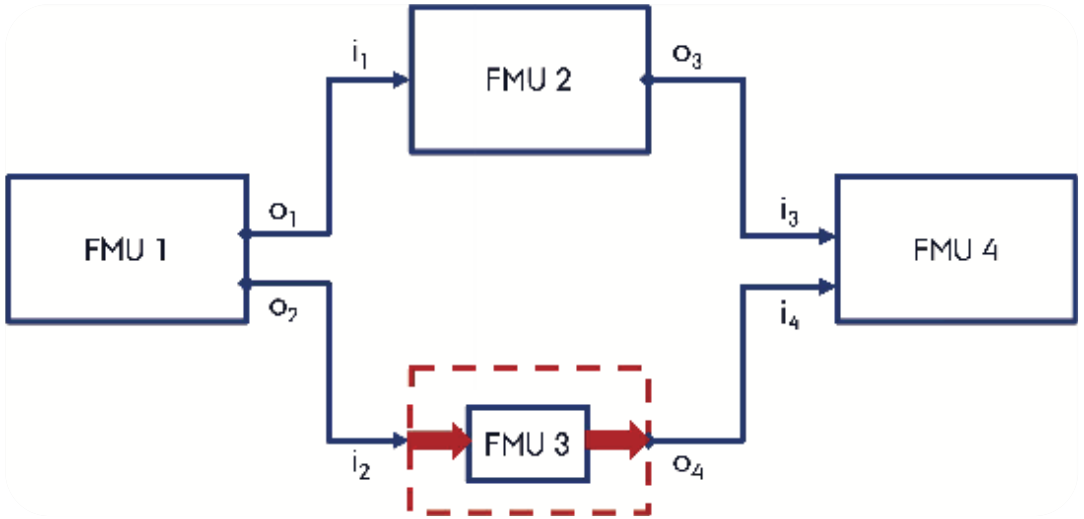
SO FAR

- **Parallel Operation**



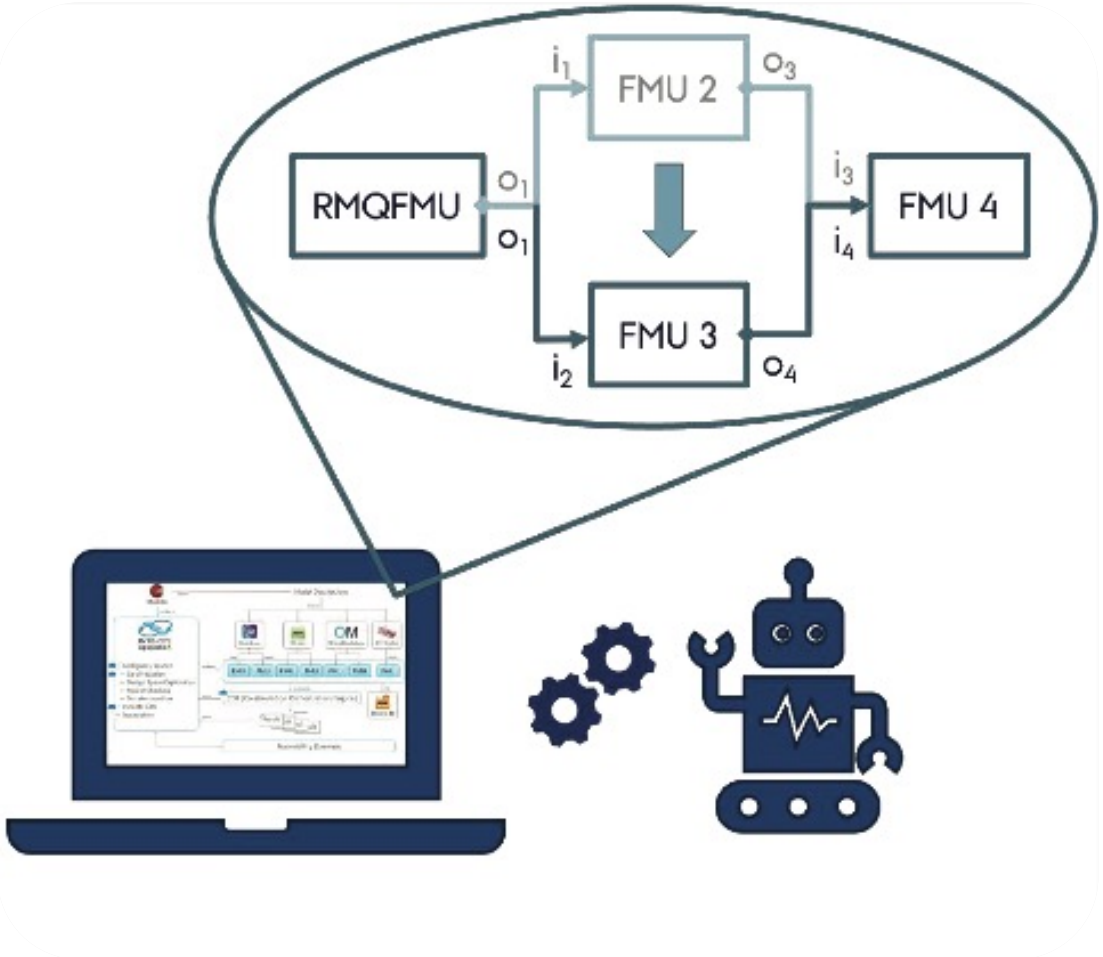
SO FAR

- Parallel Operation
- **Fault Injection with Desktop Robotti in the loop**



SO FAR

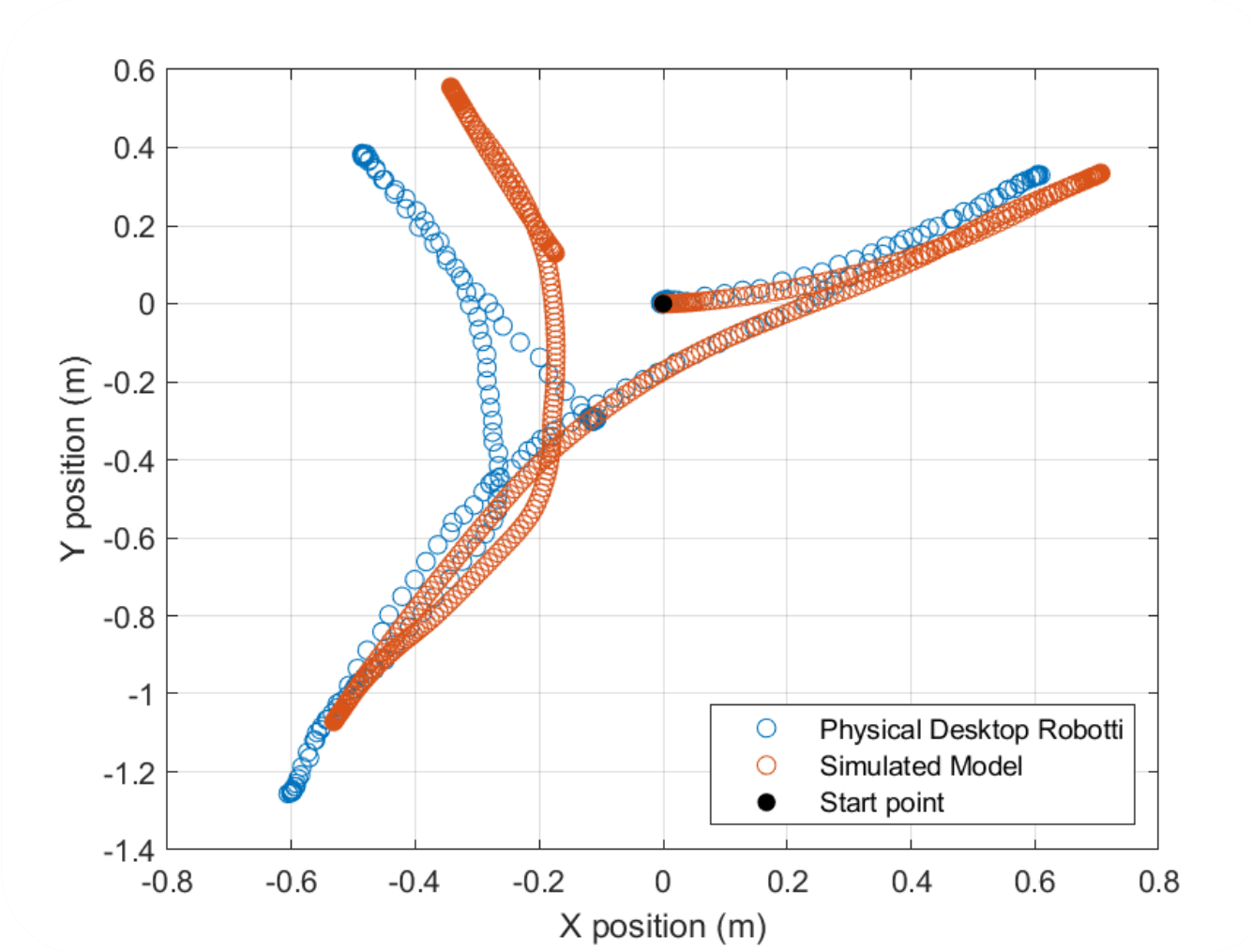
- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
- **Model-Swapping @Runtime**



NEXT STEPS

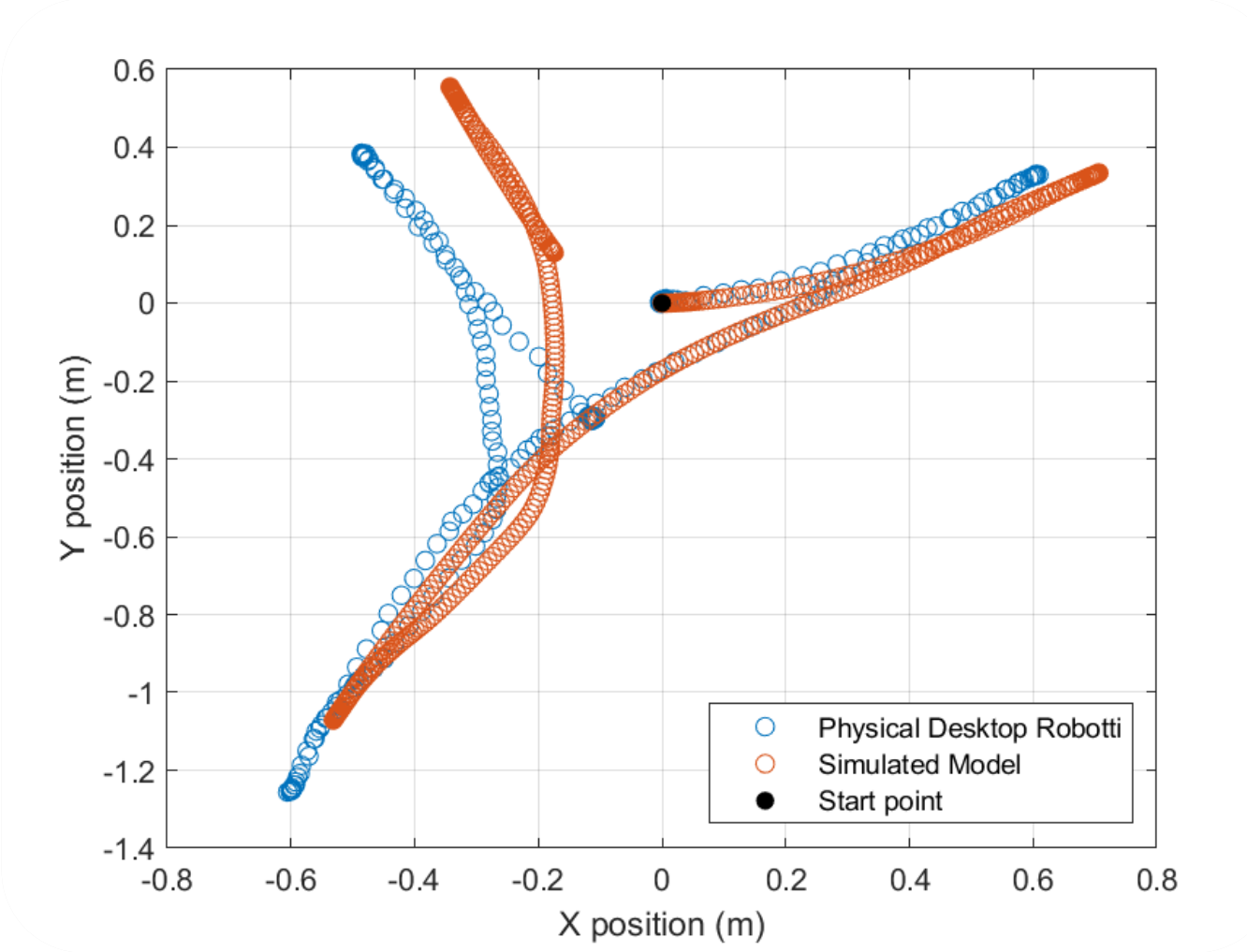
NEXT STEPS

- Parallel Operation
  - **DT fidelity**



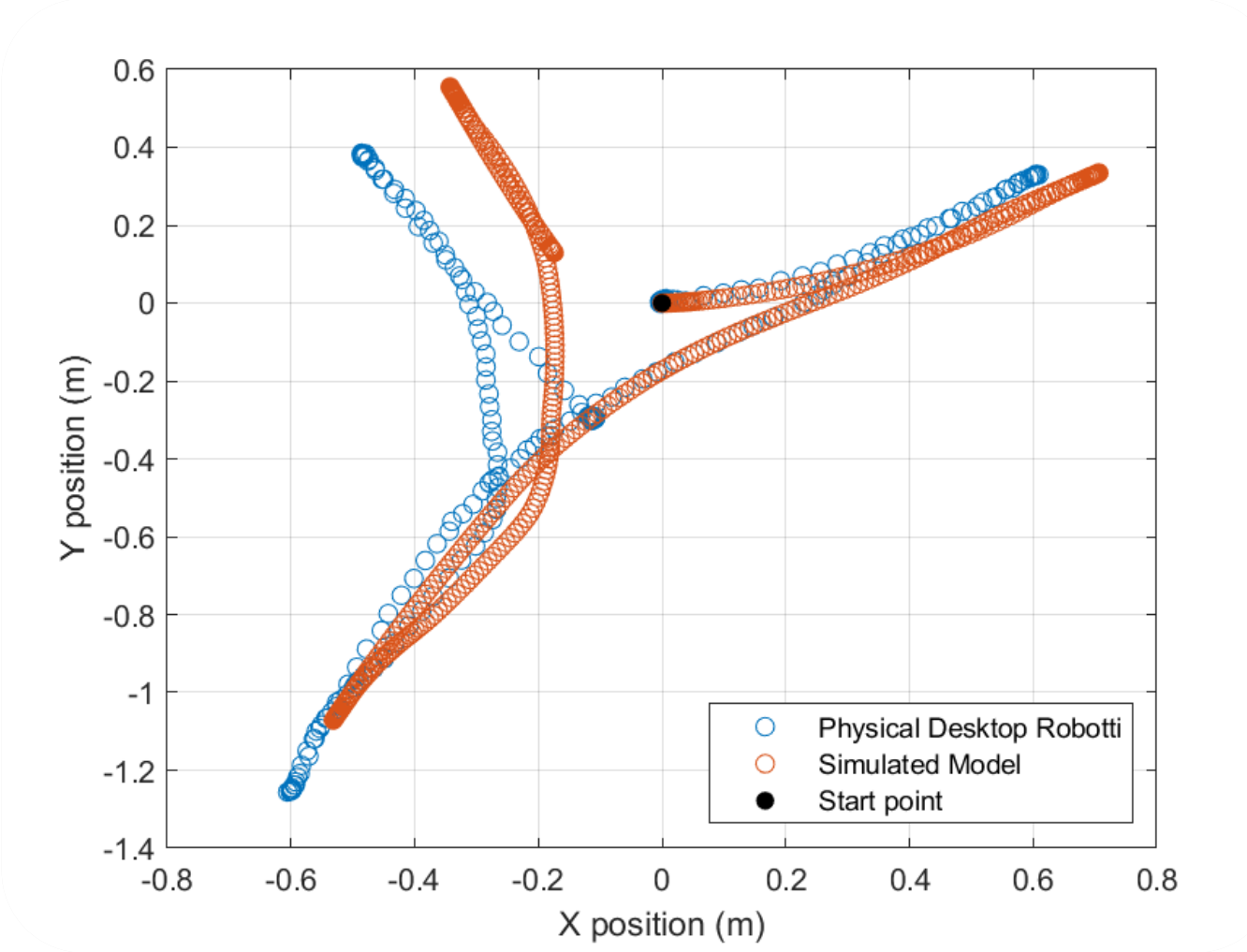
NEXT STEPS

- Parallel Operation
  - DT fidelity
  - **Prediction**



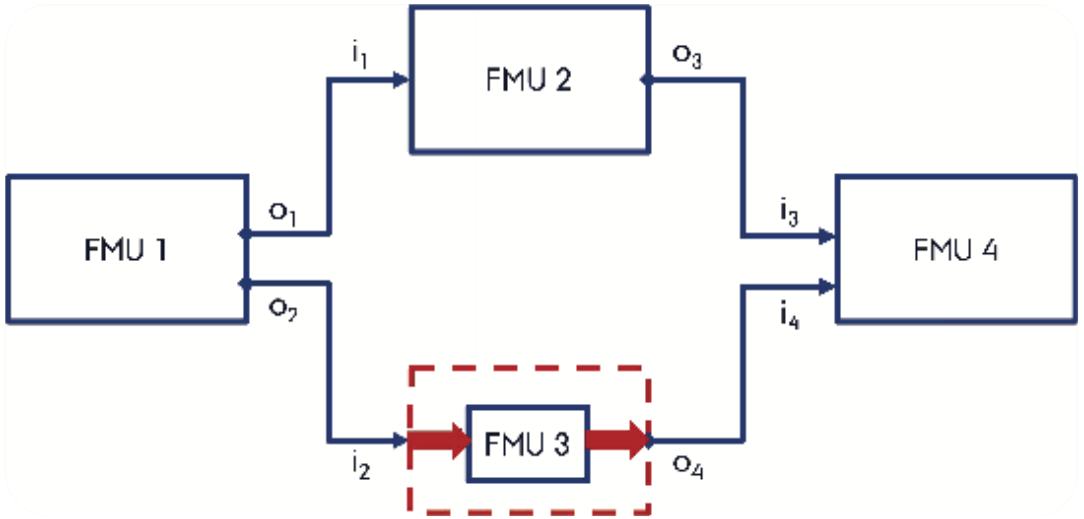
NEXT STEPS

- Parallel Operation
  - DT fidelity
  - Prediction
  - **Reconfiguration**



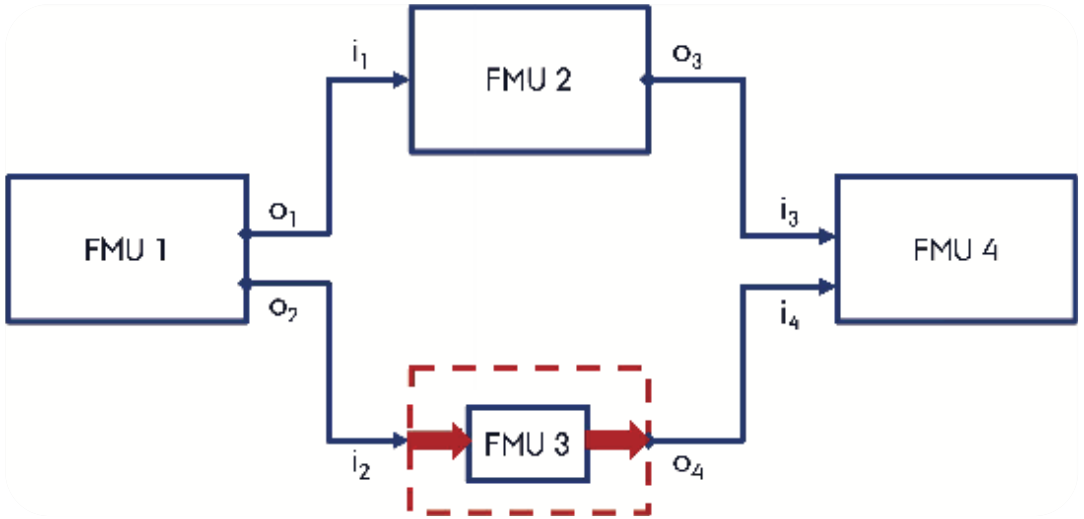
NEXT STEPS

- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
  - Injection at the DT &PT levels



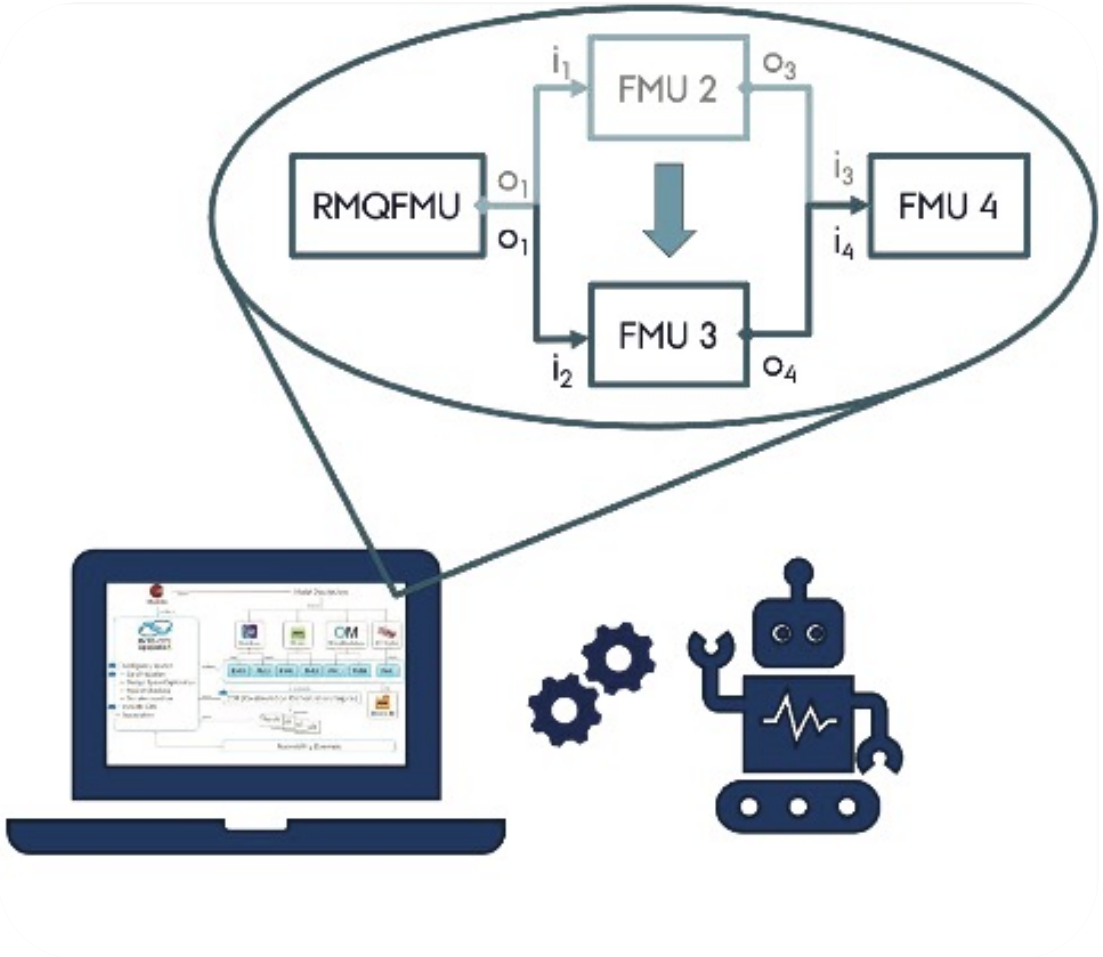
NEXT STEPS

- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
  - Injection at the DT &PT levels
    - **On-going collab with FORTISS**



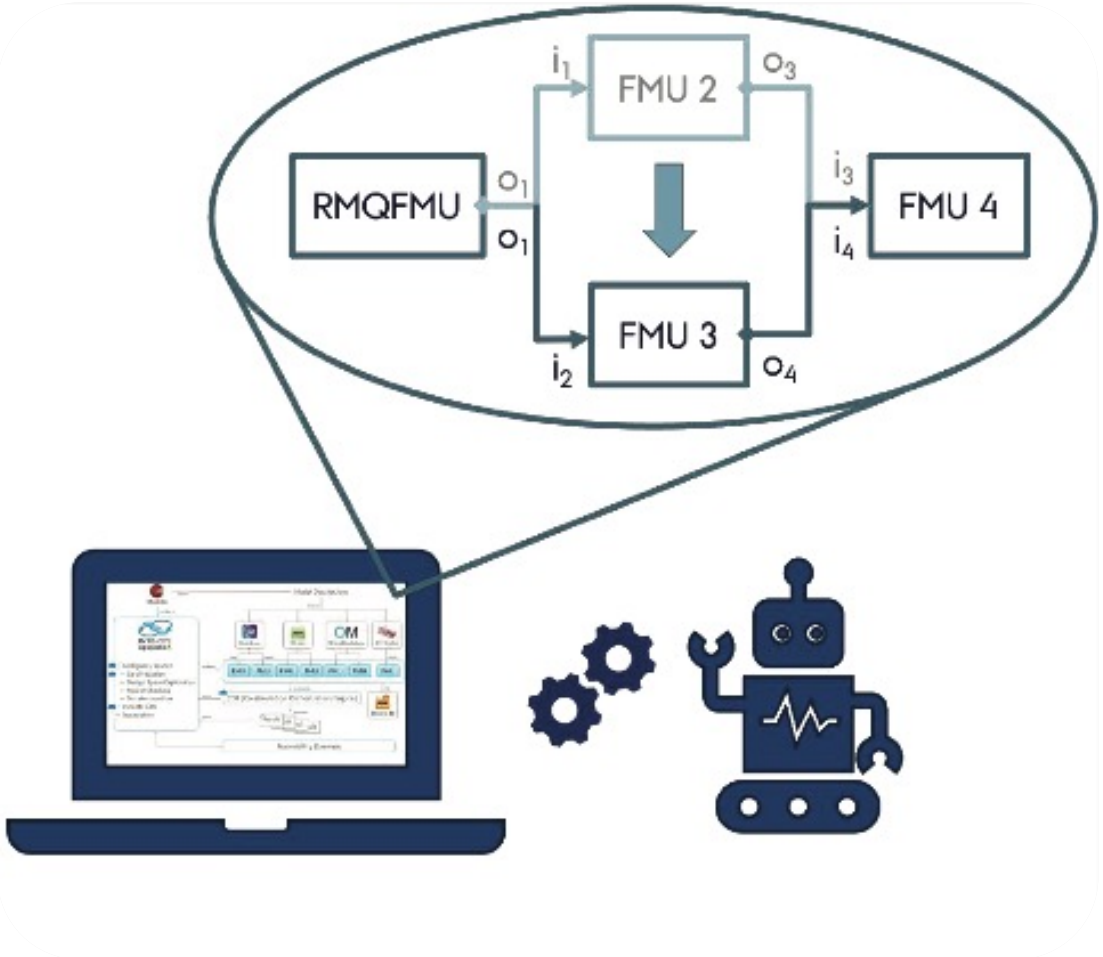
NEXT STEPS

- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
- Model-Swapping @Runtime
  - **Self-triggering swaps**



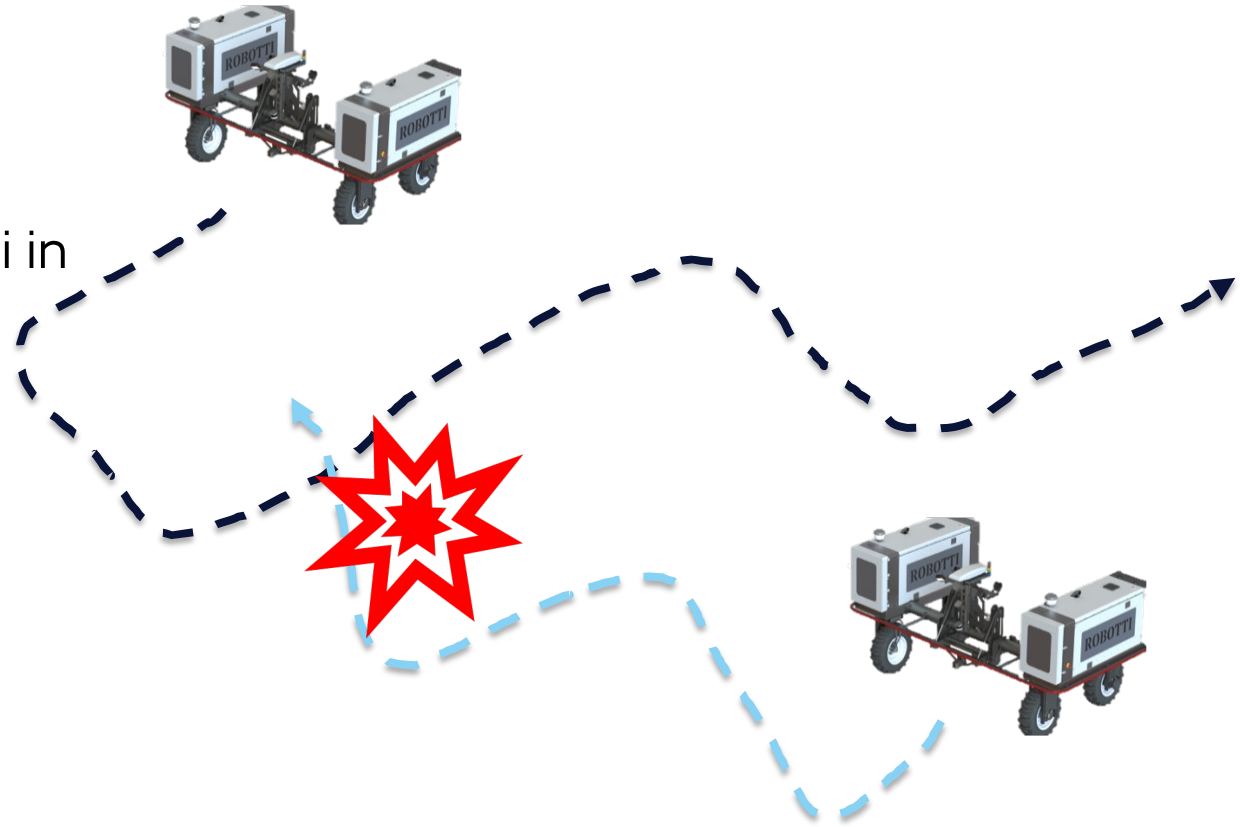
NEXT STEPS

- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
- Model-Swapping @Runtime
  - Self-triggering swaps
  - **Experiments extended in time**



NEXT STEPS

- Parallel Operation
- Fault Injection with Desktop Robotti in the loop
- Model-Swapping @Runtime
- **Collision Zones Monitoring**



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