

Model for practical works, Virtual Commissioning

Graduate



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Introduction: This bachelor thesis continues the work to create a practical work in the area of "Virtual Commissioning". With a digital twin, forces, movements and linkages of actuators and sensors can be simulated. This has the advantage that the program can be tested before the assembly and errors as well as collisions can be eliminated.

Definition of Task: The design is made in the CAD program NX. With the additional tool "Mechanical Concept Designer" properties are given to selected parts, such as contact surfaces, degrees of freedom of movements, commands for controlled movements and also sensors for the detection of positions and collisions. The inputs and outputs are processed by the virtual PLC via mapped signals. The virtual PLC is connected to the program "TIA Portal", where the values of the signals are read and written in the code.

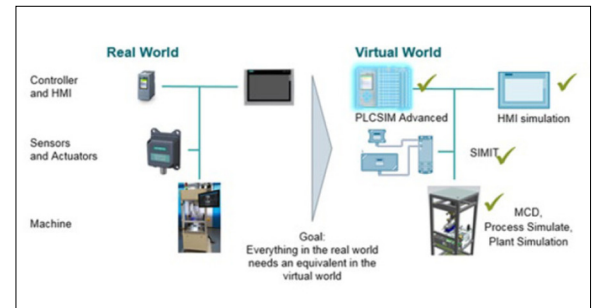
One challenge is to simulate runtime behavior that is as close to reality as possible. To achieve good runtime behavior, the computing capacity must be utilized as little as possible. It can be done by simplifying the model and the collisions. At the same time, the model must represent reality as detailed as possible.

This results in a conflict of goals:
The more detailed the model is, the more accurately reality can be displayed. The more detailed the model is, the more delayed the runtime behavior to reality.

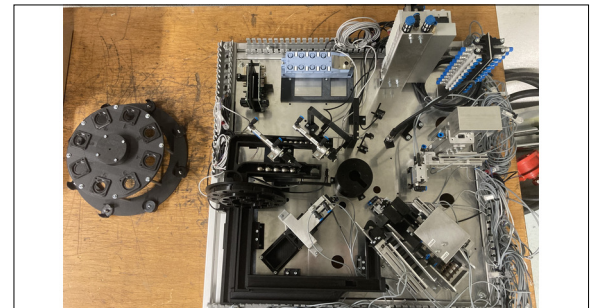
Result: During the future practical works, students can use this model to test and modify processes in the virtual environment. Finally, the virtual twin can be compared with the real built plant. Thus, different behaviors will be recognizable, which shows how realistic and credible

the simulation works.

Virtual World Siemens

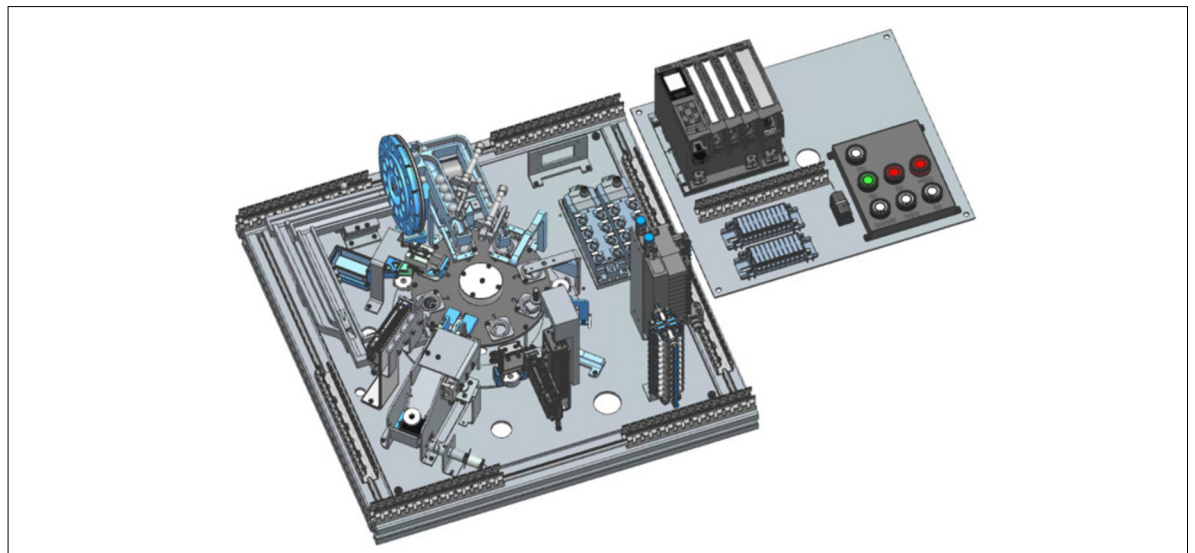


Mounted assembly Own presentation



Digital twin

Own presentation



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Subject Area

Mechatronics and
Automation
Technology,
Automation &
Robotics, Construction
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