



AUTOMATION OF ASSEMBLY LINES ASSISTED BY A ROBOTIC ARM AND A MOBILE ROBOT

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- Simulation of assembly line automation using modeling languages.
- Handling a robotic arm and a mBot.
- Creating the model to solve the problem.
- Writing the code to solve the problem.
- Prototype to simulate the AGVs in logistic processes.









1. Design Thinking











Scene2Model



DIGIFOF Scene 1 - Pick-up

Scene 2 - Deliver















2. Conceptual Modelling







DIGIFOF Scene 1 - Pick-up

Scene 2 - Deliver





Scene 4 - Reload

Scene 3 - Store





3. Cyber-Physical System















Video Representation







Conclusions and further developments

I believe that this type of project has wide applicability and can be successful in industrial companies.

From a software point of view, I used Bee-Up as a tool for the CPS part and the Flowchart as a working method, and for the Design Thinking and Conceptual Modeling parts I used Scene2Model.

In the future, I want to make the robotic arm smarter, attaching a camera so that the parts are separated based on QR codes. Apart from the automation problem, I want to make a project in which the arm is used as a 3D printer.

As for the mBot, I want to attach at least 2 proximity sensors so that it can move alone on an obstacle course.

References

- Dimitris Karagiannis, Heinrich C. Mayr, John Mylopoulos "Domain-Specific Conceptual Modeling"
- Bee-Up Tool : <u>https://austria.omilab.org/psm/content/bee-up/info</u>
- Scene2Model Tool : <u>https://austria.omilab.org/psm/content/scene2model/info</u>
- ADOxx : <u>https://www.adoxx.org/live/home</u>
- OMiLAB Approach : <u>https://www.omilab.org/assets/docs/OMiLAB%20Laboratory%20Layout_DRAFT.pdf</u>





Thank you for your attention !





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