Software design for a Digital Twin of 3D printing equipment

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Additive Industries

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- The meaning
- The result
- The use cases
- The tools

- Analyse the domain
- Basic knowledge Unity
- First animation with the arm

Sprint 1

- Reading a sequence from the file
- Correct movement from this file
- Import machine configurations

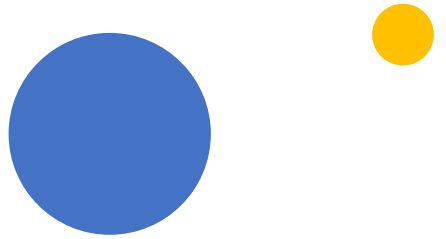
Sprint 2

- Stepping through the routine
- Connect an ADS bus to the animation
- Unit test
- CI

Sprint 3

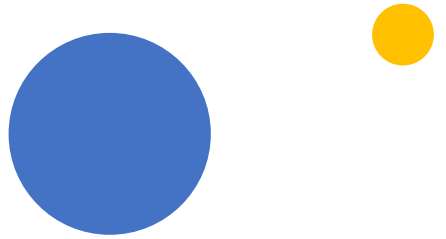
- See the entire routine with one push on the button
- Refactor the code so that it testable
- Visualize the complete machine (not only the arm)

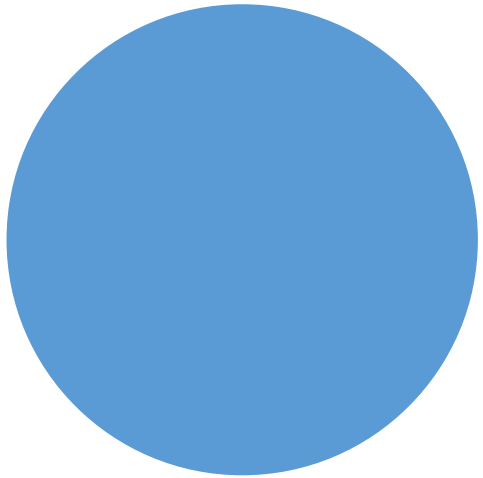
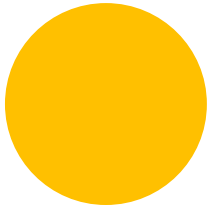
Sprint 4



- Wrapping up the project
  - Documentation
  - Handing it over to the next team
  - Finalizing everything
- Testing the hardware

Sprint 5



Demo

Questions

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FHICT

Introduction

The customer is looking to develop a digital twin for their products. The products they have are metal 3d printers.

Create a digital twin of the metal 3d printer. Which is capable of loading the machines configuration. Work itself through steps, and can be connected to a real machine.

Context

Project's stakeholders: Joey Offermans, Tim Hoenselaar, Wouter Buters, Rik Kamerbeek, Ralph van Montfort, Teade Punter, Adrie Boverhof, Additive Industries

Methods

Within this project there were several topics to research. Within each of these topics the students did a research. The research has been investigated using the dot framework. The following fields where used:
Veld
Werkplaats
Lab
Show

All of these researches can be found in the git repository.

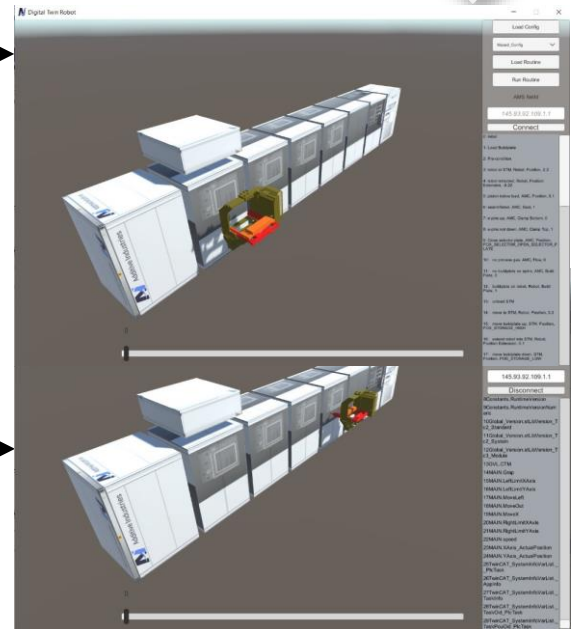
More information:

https://git.fhict.nl/pii_htes/digital-twin-of-3d-printing-equipment-1920vj
https://git.fhict.nl/pii_htes/digital-twin-of-3d-printing-equipment-1920vj/-/wikis/home

Results, Conclusions and Discussion

The Digital Twin we build

In the images there is a animation shown. As seen, the robot arm moves sideways through the steps of the configuration file



Possible further directions

The following group needs to contact the customer to ask what they would have in mind in the further. We would recommend to test all the classes. If the customer would give the next time even the rest of the files, they also can implement the rest of the machine. So that this can be a real digital twin.

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