

flecsimo

A Flexible Cell Manufacturing Simulation Model

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co-funded by digLL 2020



Faculty 3 Business and Law

Industry 4.0 in the present

Daimler: Factory 56

<https://www.daimler.com/innovation/produktion/factory-56.html>

KUKA: Matrix production

<https://www.kuka.com/en-de/industries/solutions-database/2016/10/matrix-production>

BCG: Flexible Cell Manufacturing

<https://www.bcg.com/de-de/publications/2018/flexible-cell-manufacturing-revolutionize-carmaking>

Educational perspective:

Important topic also for non-technical study courses ./ accessibility is an issue.

flecsimo solution: Provide simple to use cyber-physical experiments, which “unveil” interfaces, processes, chances and risks – instead of “hiding” them to reduce complexity.

See also: [Why fleximo?](#)

What's in it

flecsimo :: open educational platform

:: flexible cell manufacturing simulation model

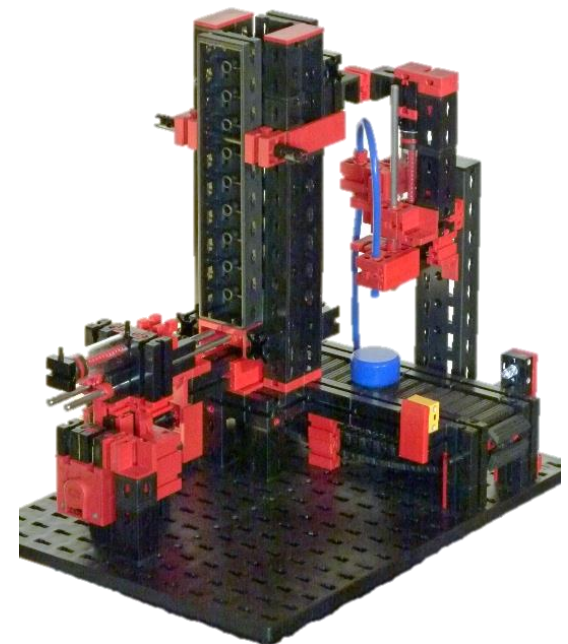
co-funded by DigLL 2020 (<https://www.digll-hessen.de/>)

:: CPS based Manufacturing Cells

+ Control Software

+ Learning Material

July 2020 assembly-cell prototype based on
fischertechnik, ~ 20 x 30 cm



flecsimo will offer

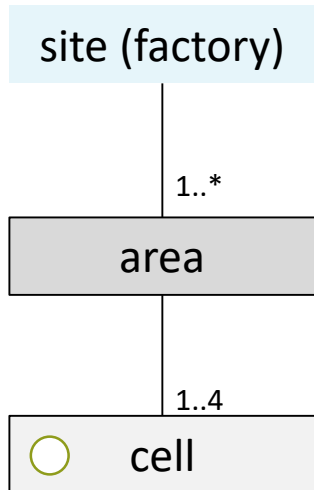
An *flexible* IIoT messaging backbone with open interfaces



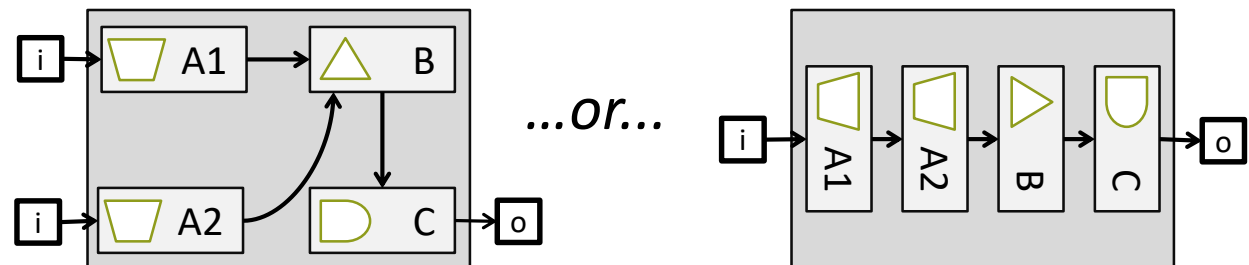
Control Software

Data Collection for Data Analytics

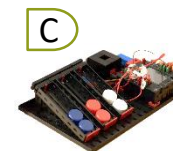
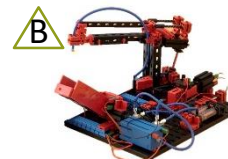
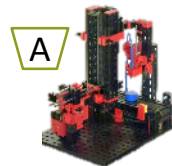
Manufacturing data model



A *flexible* cell layout for logistical experiments...



... with different cell types:



Where we are – where to go

2019/12
Project start

2020/08
First Draft 0.1.3. on PyPI available

Plan: 2021/03
Evaluation winter-term 2021/21
First learning materials published



Plan: 2020/11
First physical workstation model available. Concept evaluation in logistics master course.

Future developments:
SAP IDoc Importer (file/xml)
Save readings in time series database
Camera guided transportation
Planning algorithms and data analytics
and much more ...

How to participate

- Have a look at the project space

<https://confluence.frankfurt-university.de/display/FFP>

- Give us feedback – we will be happy about it

banning@fb3.fra-uas.de

- Give it a try

<https://pypi.org/project/flecsimo>, [Video Instructions Installation](#), [flecsimo proof of concept](#)

- Contribute – with new ideas, use cases or development power

<https://gitlab.com/flecsimodev/flecsimo>

Thank You for listening!

we :: Ralf Banning, Bernhard Lehner + community of developers