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MODELLING AND SIMULATION OF AN AUTOMATED SYSTEM IN AN AGRICULTURAL WAREHOUSE

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Specialization: Computer Science

Agenda

Objectives

1

Technology Stack

2

Creation and realisation
of the proposed scenario

3

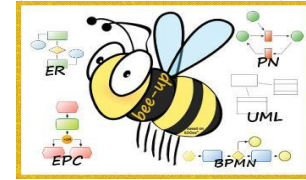
Conclusions and further
development

4

Objectives

- ❑ Creating the scenario in Scene2Model
- ❑ Implementing the scenario in the Bee-Up environment
- ❑ Writing code to perform specific operations

Technology Stack



REALVNC

Th



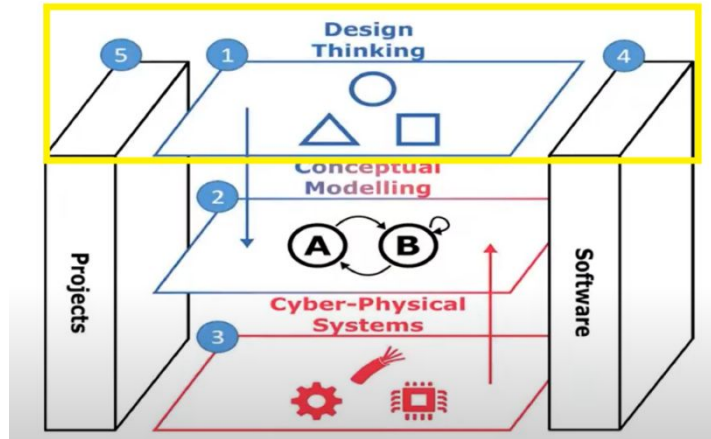
firebase



Creation and realisation of the proposed scenario

- ❑ Design Thinking
- ❑ Conceptual Modelling
- ❑ Cyber-Physical Systems (CPS)

Design Thinking

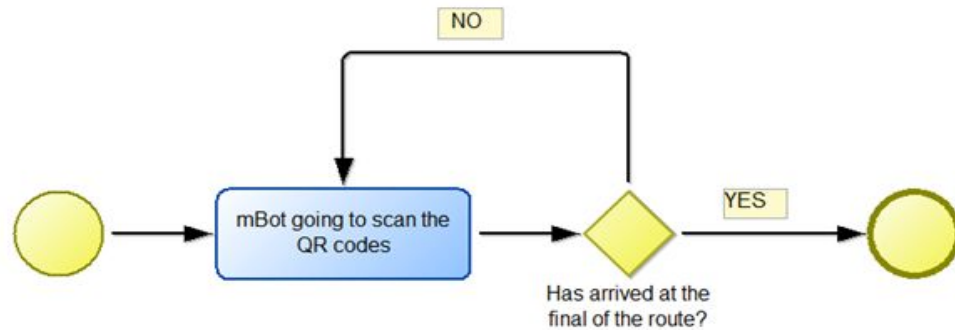
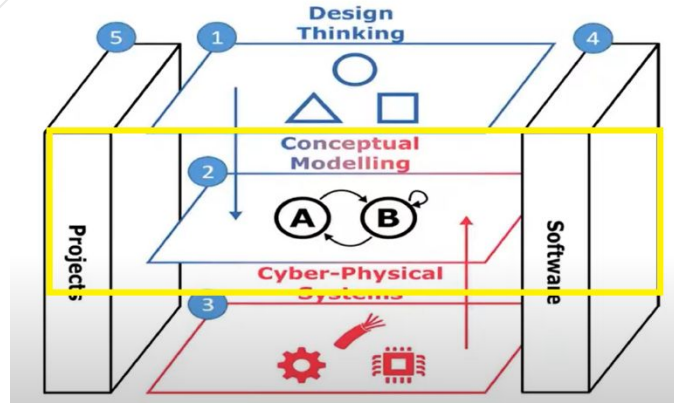


Implemented scene

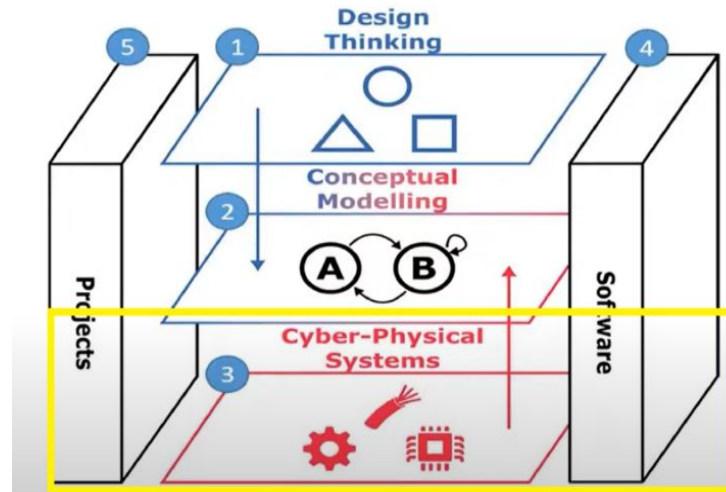
- ❑ mBot starts from a fixed starting point of the route
- ❑ mBot stops at the side of each QR code to scan it
- ❑ The scanned information is instantly sent to a database
- ❑ mBot reaches the end of the pre-defined route

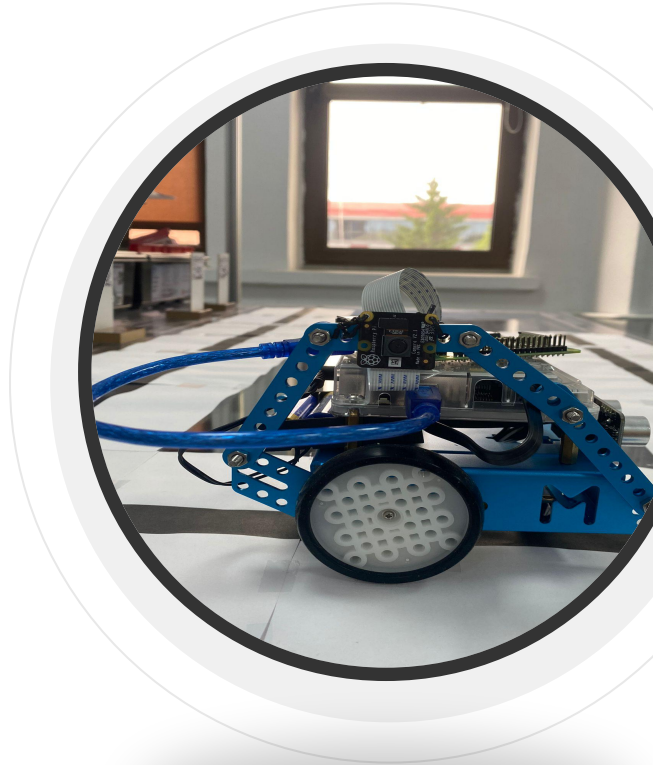
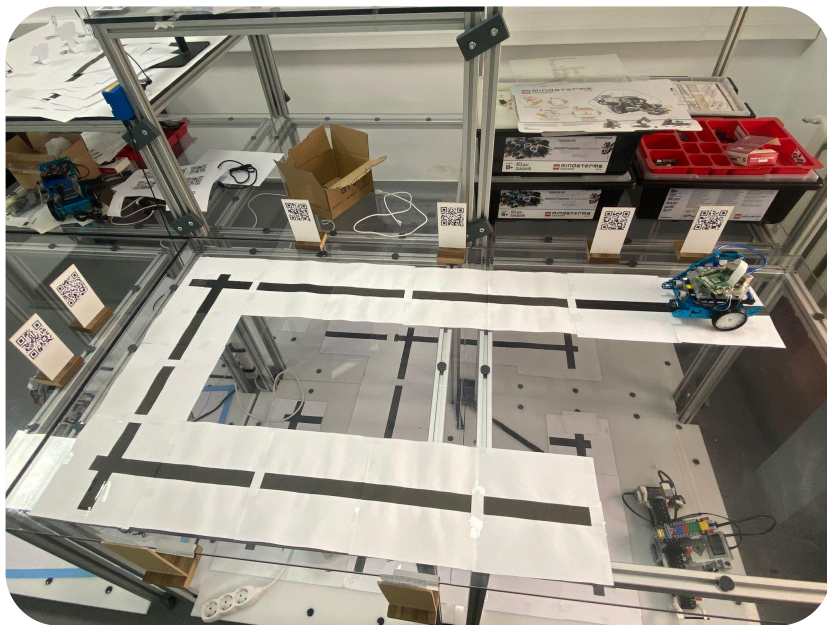


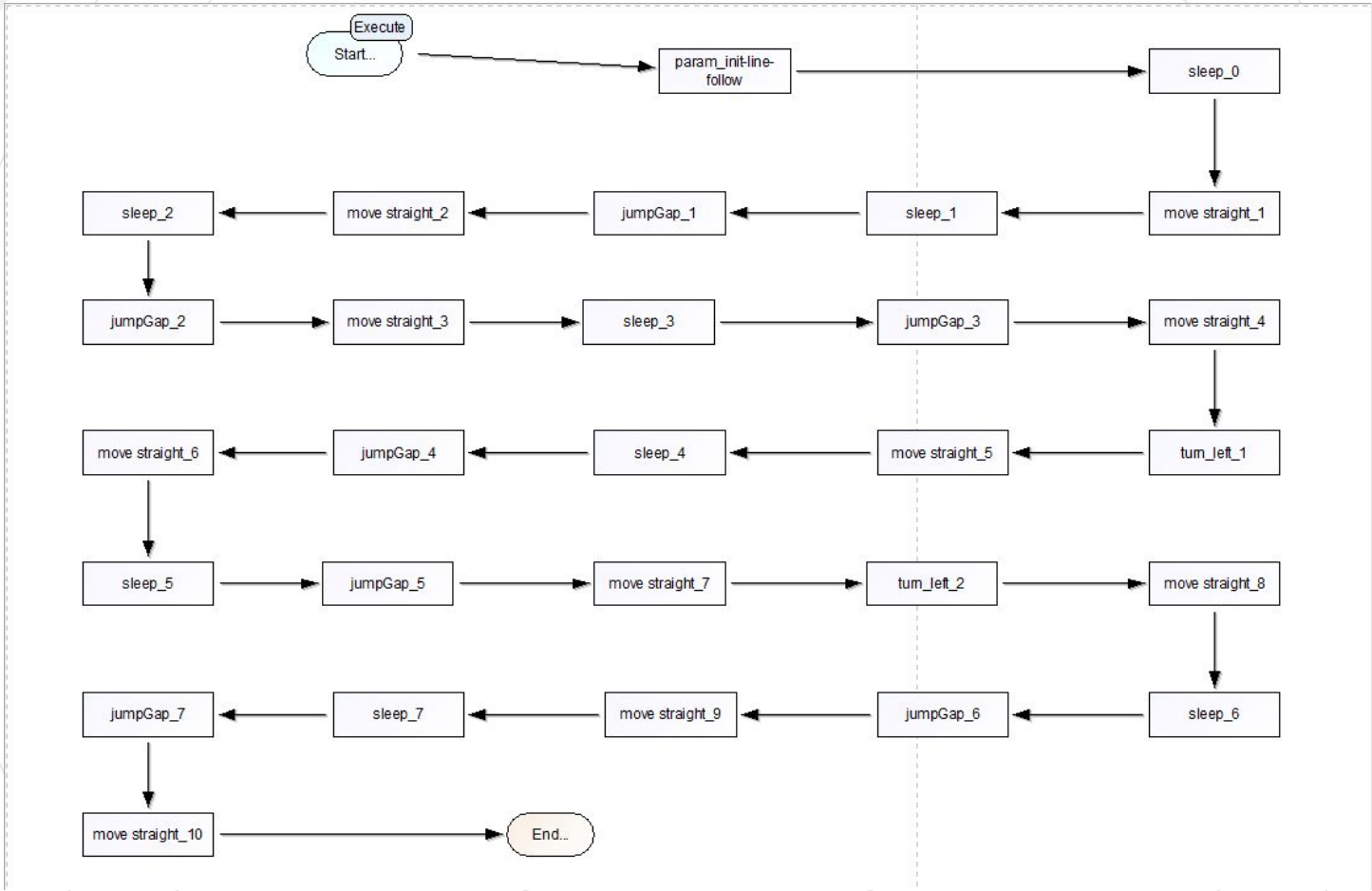
Conceptual Modelling



Cyber Physical System







param_initline-follow

Operation code:

```
# We use SETLs instead of := to set several things at once
SETL str_roboturl1:("http://10.14.10.241:8080/mBot/api/linefollowing_operation/")
SETL map_headers:({"Content-Type":"application/json"})
```

Variables:

- ip - contains the IP address of the web platform to be accessed. It will also contain the name of the called function set
- map_headers - specifies the JSON content-type of the HTTP API request

move straight_1

Operation code:

```
HTTP_SEND_REQUEST (str_roboturl1+ "moveStraight?speed=100") str_method:("GET") map_reqheaders:
(map_headers) str_reqbody:("do") val_respcode:val_httpcode map_respheaders:map_respheaders
str_respbody:str_respbody
```

- The input parameter can be seen in the variable speed

QR Code scanning

- Similar to barcodes
- Can encode a variety of data types
- Reduces human time and physical labour

```
Shell  
  
ID: 13  
Tip: Mandarin  
Cantitate: 116  
Pret/Kg: 5  
Tara provenienta: Italia  
Data scanarii: 06-Jun-2022  
Ora scanarii: 13:21:11
```



Firestore database



Displaying data in the visual interface

Stoc Depozit

Depozit

ID

Tip

Cantitate(Kg)

Preț (Lei/Kg)

Țara

Data scanării

Ora scanării

Start refreshing Delete

ID	Tip	Cantitate	Preț	Țară	Data Scanării	Ora scanării
*						

Stoc Depozit

Depozit

ID

Tip

Cantitate(Kg)

Preț (Lei/Kg)

Țara

Data scanării

Ora scanării

Stop refreshing Delete

ID	Tip	Cantitate	Preț	Țară	Data Scanării	Ora scanării
1	Mere qolden	120	4	Cipru	31-May-2022	14:20:12
4	Kiwi	89	6	India	31-May-2022	14:20:45
11	Mango	95	13	Indonezia	14-Jun-2022	10:26:00
12	Lămâi	220	3	Turcia	14-Jun-2022	10:26:06
13	Mandarine	116	5	Italia	14-Jun-2022	10:26:12
14	Cartofi albi	135	2	România	14-Jun-2022	10:26:19
15	Pere	90	11	Franta	14-Jun-2022	10:26:27
18	Ciuperci	76	5	România	14-Jun-2022	10:26:32
16	Afine	105	30	Suedia	14-Jun-2022	10:26:42

Conclusions and further development

- This type of project is innovative, with a wide range of possibilities and allows the creation of many possible scenarios without requiring advanced knowledge.
- As further developments, I would like to improve this project by managing each fruit/vegetable (UPDATE), but also by automatically summing the quantities of a product with the same ID if it has been scanned before.



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**Thank you for your
attention!**



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