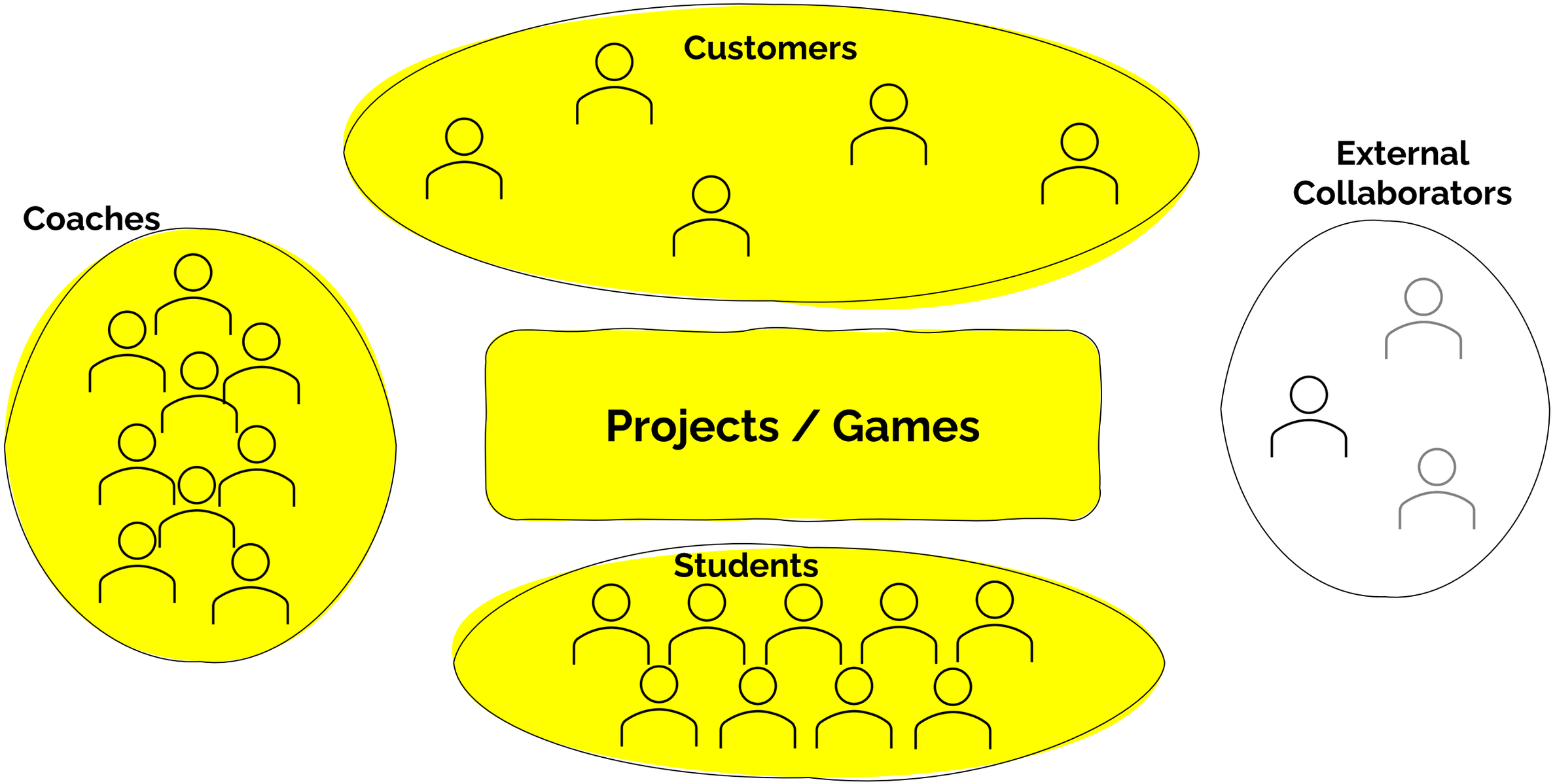
University of Applied Sciences and Arts Northwestern Switzerland
School of Engineering

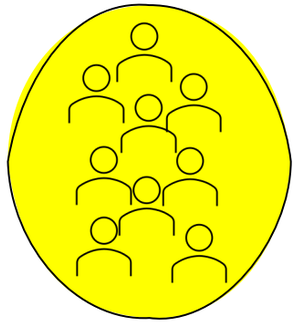
ConnectFHNW

Games from students for students


Customers
Coaches
External Collaborators
Projects / Games
Students

Prof. Dr. Barbara Scheuner

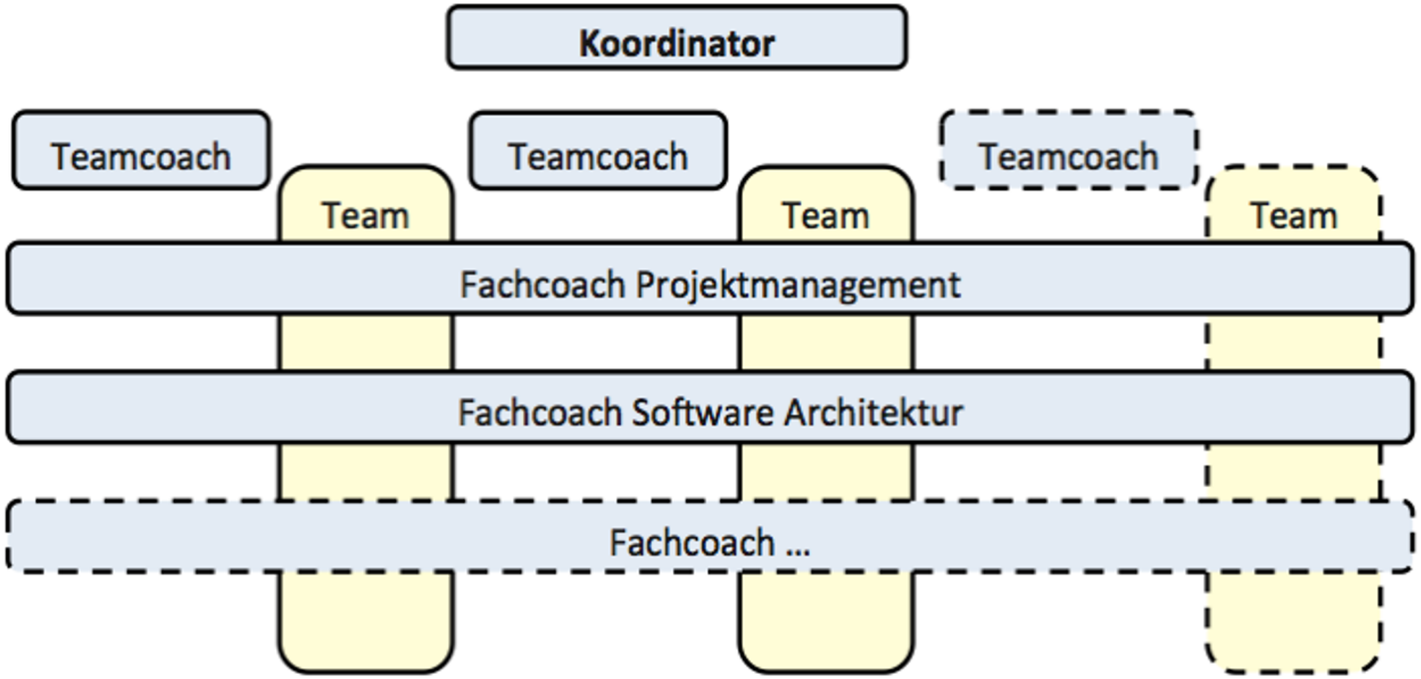
- Co-Head of the BCs Programm in Computer Science
- Background: Major in Theoretical Computer Science and Minor in Didactics from ETH
- I love to play games, work with my hands and teach



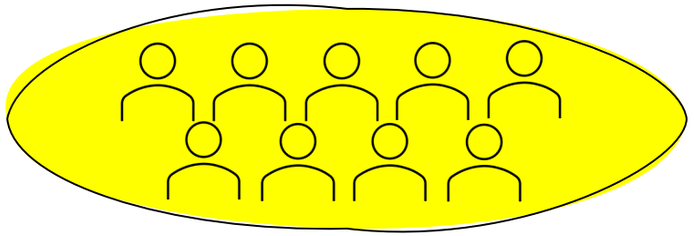
Coach Team

Different Coaches:

- Project Management
- Requirements Engineering
- Usability
- Information Management
- Software Engineering
- Source Code
- Testing



Each team also has a team coach for organizational questions.



Students (computer science students)

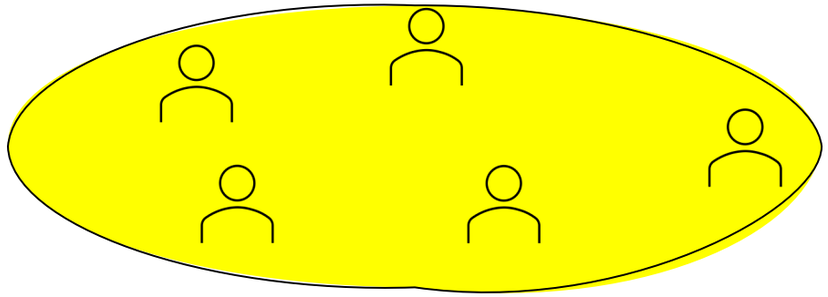
Groups of 7-9 students with different experiences and interests.

The student group (55 Students) of this year consists of:

- 15 Women / 40 Men
- 30 Computer Science / 25 Profile iCompetence

Backgrounds:

- 16 Computer Science apprenticeship
- 12 KV
- Others like: Automation technician, clothing designer, electronics technician, information and documentation specialist, building services planner, geomatics technician, chemistry laboratory technician, media technician, primary school teacher, production mechanic, architectural drawer

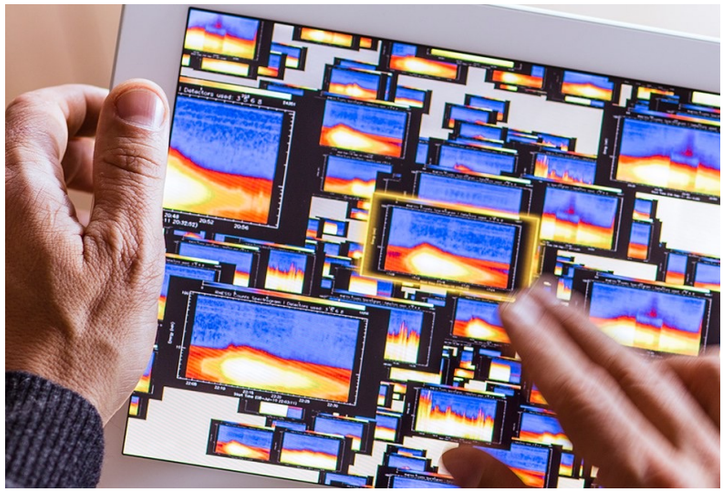


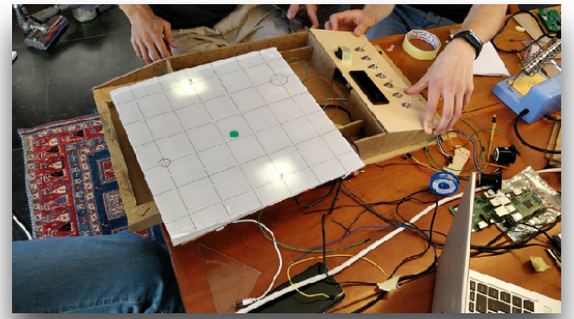
Customers

The customers are employees of the FHNW School of Engineering.

They are either

- Teachers, who are teaching courses for the CS-Students. Currently, mostly mathematical courses.
- Scientific staff from an institute (IIT, IMVS, I4DS)



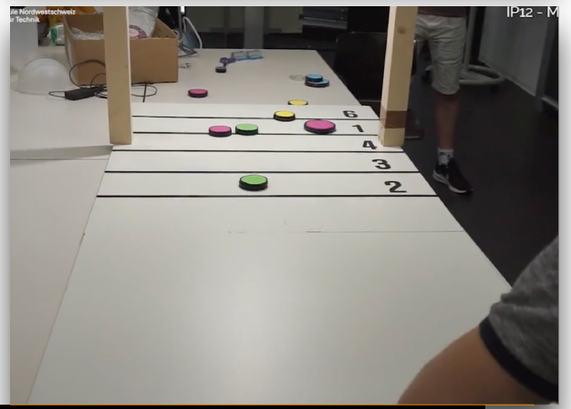


Projects

All projects use a RaspberryPi and Java to build a computer science related game.

The games typically are:

- Board Games
- Acrade Games
- Natural Games



100% Pure Java

Pi4J

JavaFx

FXGL

Board Game

Board games use a highly sofisticated board with multiple sensors and output devices such as:

- Buttons
- RFID Readers
- LEDs (also available as Matrix)
- Speakers

Technology used:

- Java 17 + Pi4J V2

Arcade Game

Arcade games have a display and a controller.
They can be played on a «normal» computer.

Technology used:

- FXGL
- Java 17 + Pi4J V2

Natural Game

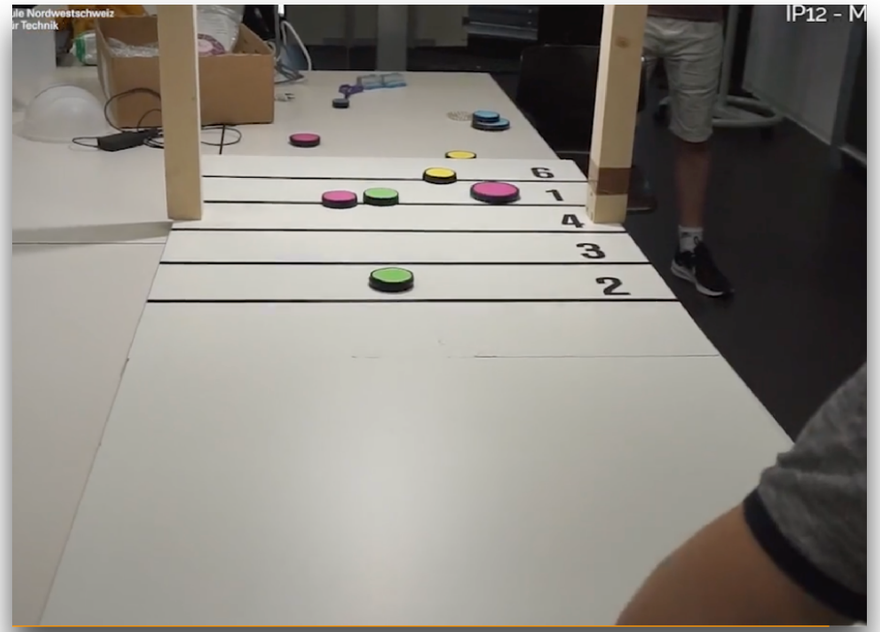
Natural games consist of physical parts which are recognized via a camera.

They may include a controller to support the game.

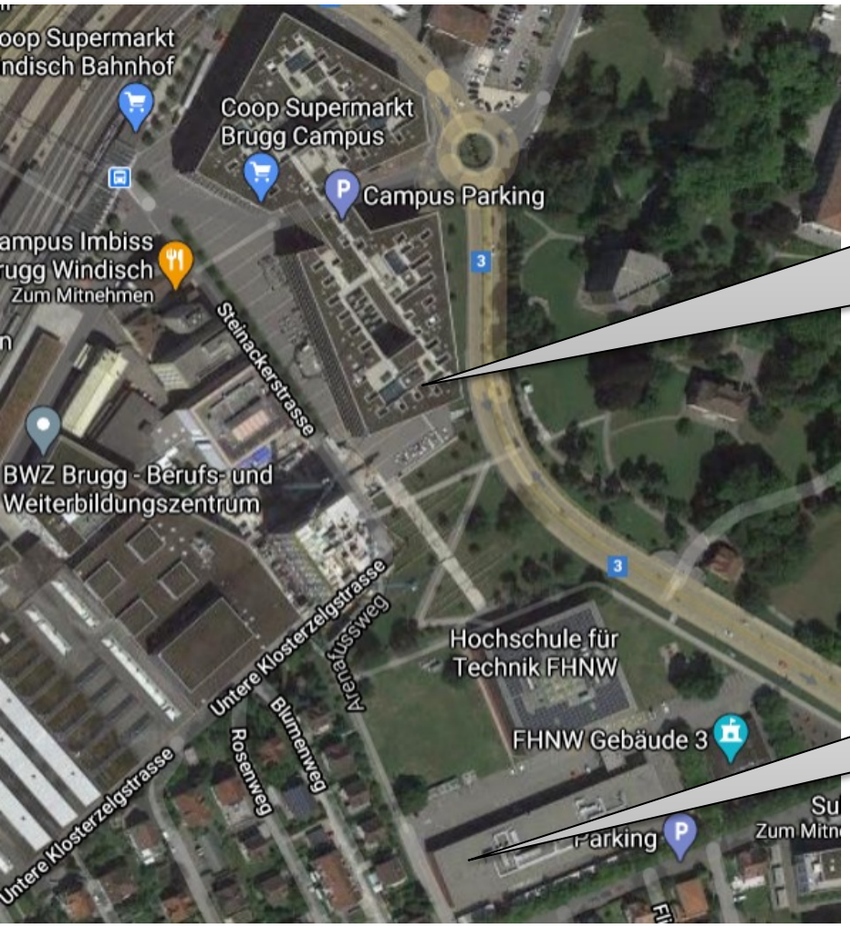
The status of the game is calculated on the basis of snapshots.

Technology used:

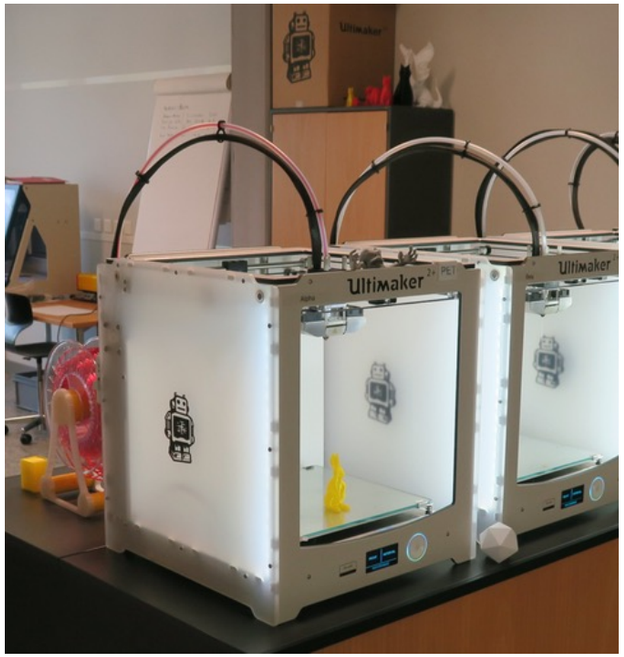
- JavaCV
- Java 17 + Pi4J V2



Maker facilities



Maker Studio with 3D printers.
https://web.fhnw.ch/plattformen/makerstudio/



Inhouse factory for laser cutting

Structure and learning environment

We give an overall timetable with some fixed dates.

Kickoff-Week, team builing, contact with first Pi4J project

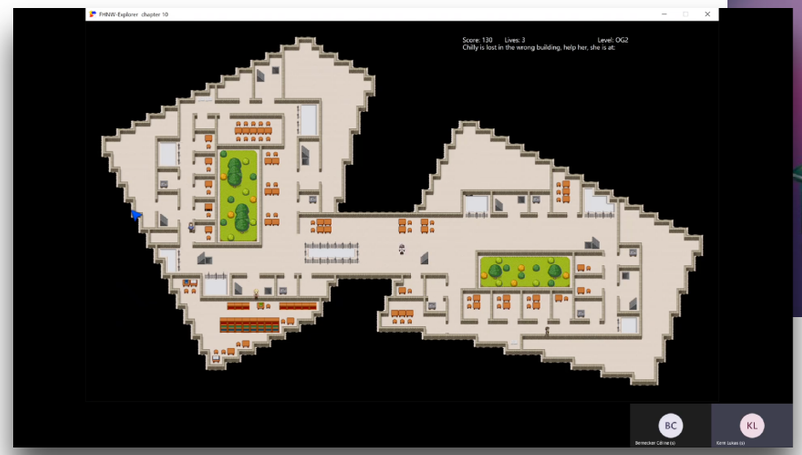
Project week: one week without additional courses

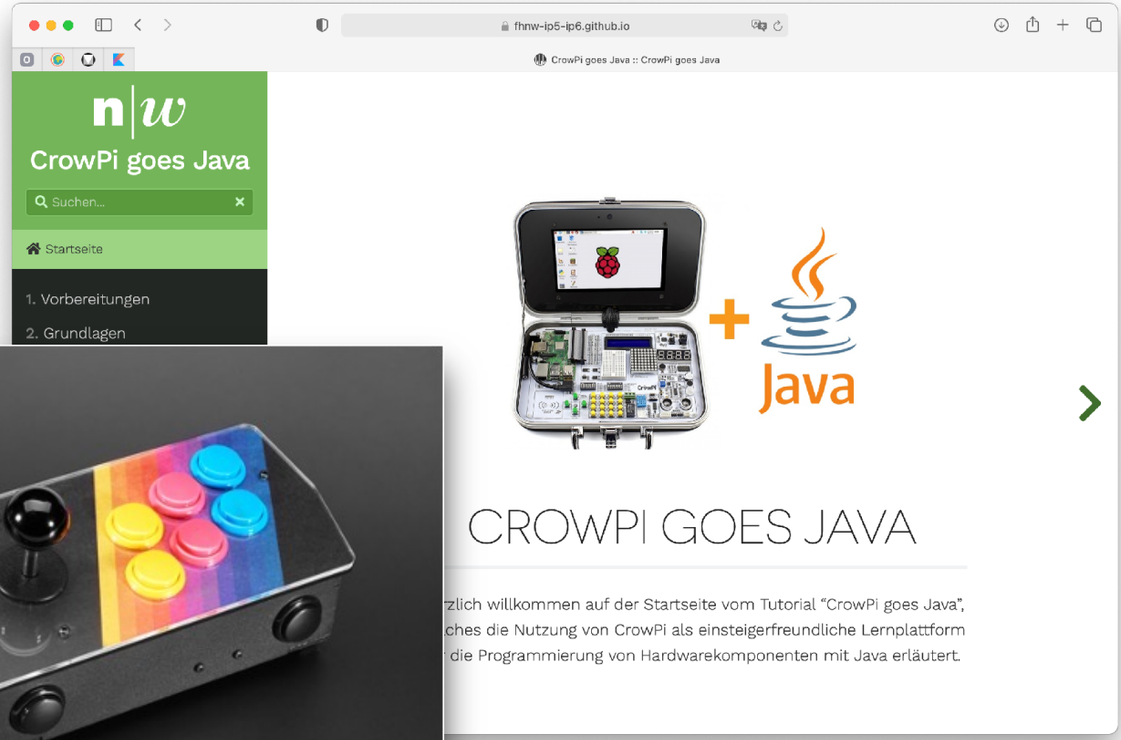
		Herbstsemester															Frühlingssemester																						
Jahr		2021															2022																						
Kalenderwoche	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Montag - Samstag	13.09. - 18.09.	20.09. - 25.09.	27.09. - 02.10.	04.10. - 09.10.	11.10. - 16.10.	18.10. - 23.10.	25.10. - 30.10.	01.11. - 06.11.	08.11. - 13.11.	15.11. - 20.11.	22.11. - 27.11.	29.11. - 04.12.	06.12. - 11.12.	13.12. - 18.12.	20.12. - 25.12.	27.12. - 01.01.	03.01. - 08.01.	10.01. - 15.01.	17.01. - 22.01.	24.01. - 29.01.	31.01. - 05.02.	07.02. - 12.02.	14.02. - 19.02.	21.02. - 26.02.	28.02. - 05.03.	07.03. - 12.03.	14.03. - 19.03.	21.03. - 26.03.	28.03. - 02.04.	04.04. - 09.04.	11.04. - 16.04.	18.04. - 23.04.	25.04. - 30.04.	02.05. - 07.05.	09.05. - 14.05.	16.05. - 21.05.	23.05. - 28.05.	30.05. - 04.06.	06.06. - 11.06.	13.06. - 18.06.
Herbstsemester		1	2	3	4	5	6	7	8	9	10		11	12	13			14	15																					
Frühlingssemester																								1	2	3	4	5	6	7	8		9	10		11	12	13	14	15
Einführungswoche für 1. Sem.	E																																							
Projektwoche												P																							P					

Technological support

We provide some «playgrounds» with ready to start projects:

- CrowPi (https://fhnw-ip5-ip6.github.io/CrowPiGoesJavaTutorial/de/)
- Picade
- FXGL-Tutorials





Ready made OS Images

Pi4J-OS

- pure Pi4J-projects, pure JavaFX-projects, pure FXGL-projects
- integrated JavaFX/Pi4J projects

CrowPi-OS

- for all experiments on CrowPi

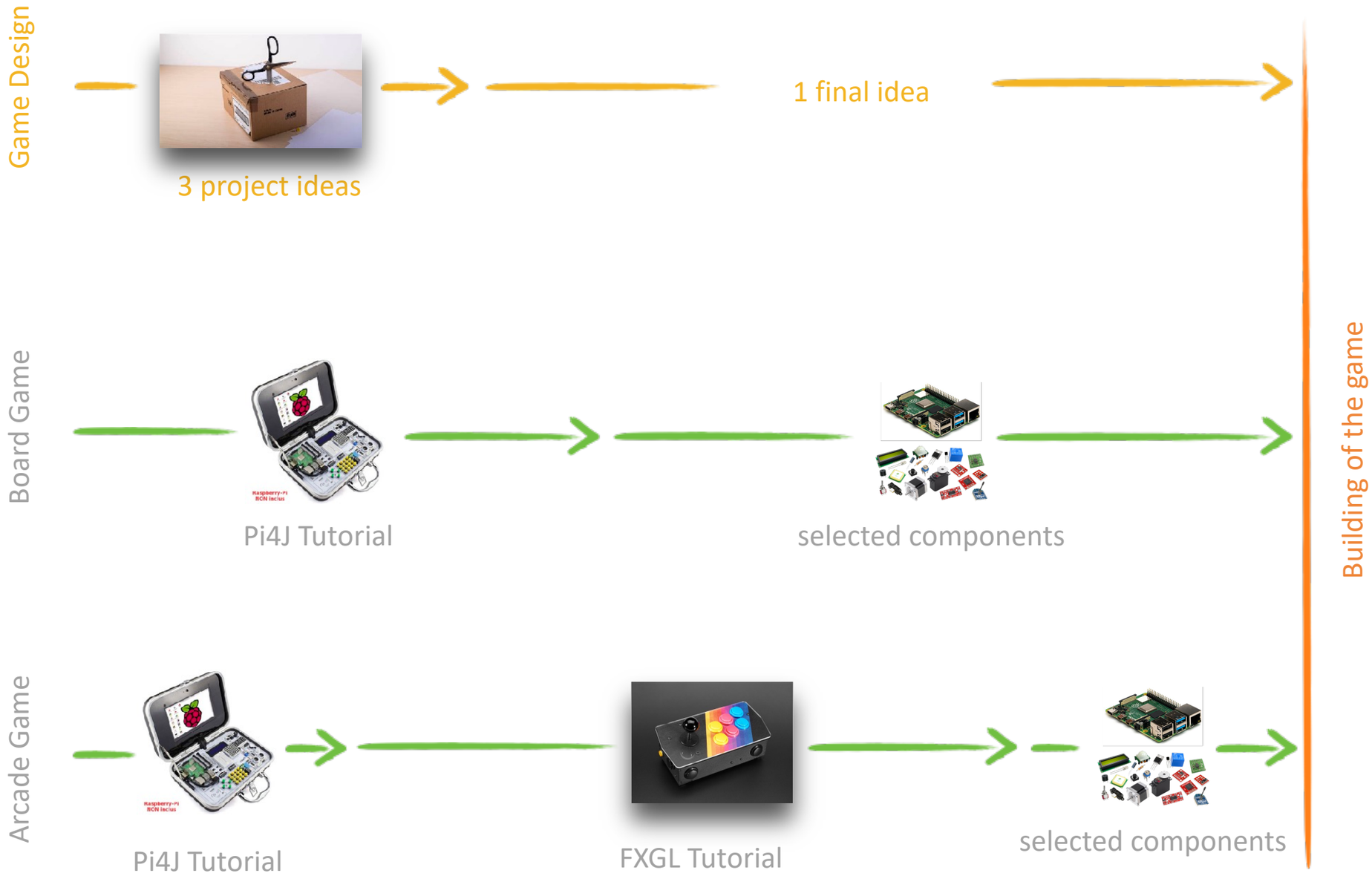
Picade-OS

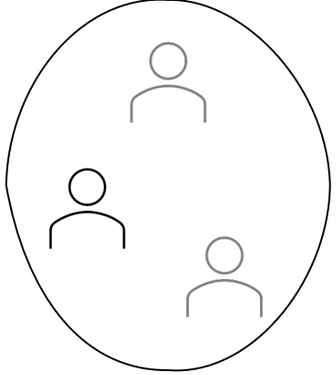
- FXGL-projects for Picade

GameHAT-OS

- FXGL-projects for GameHAT

visit: https://github.com/Pi4J/pi4j-os


Game Design
3 project ideas
1 final idea
Board Game
Pi4J Tutorial
selected components
Arcade Game
Pi4J Tutorial
FXGL Tutorial
selected components
Building of the game



External Collaborators

To connect our students to open source collaborators and to share our knowledge we participate in the Pi4J (https://pi4j.com/about/) project.

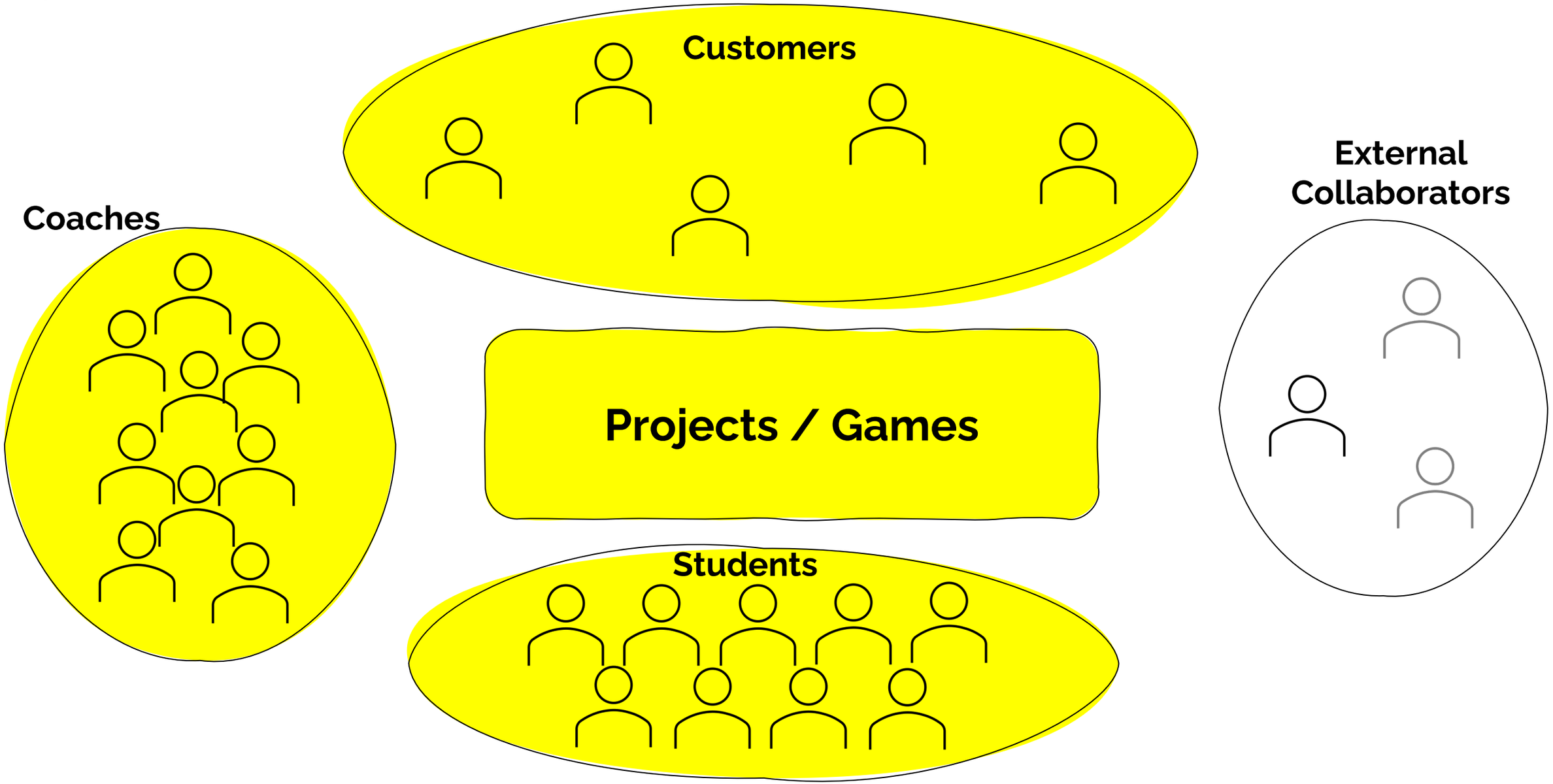
- Frank delPorte from Belgium (https://github.com/FDelporte)
- Robert von Burg (https://github.com/eitch)

For the arcade games we are using FXGL:

- Almas Baimagambetov from the University of Brighton: https://github.com/AlmasB

For Support concerning JavaFX on the RaspberryPi:

- Gluon: https://gluonhq.com/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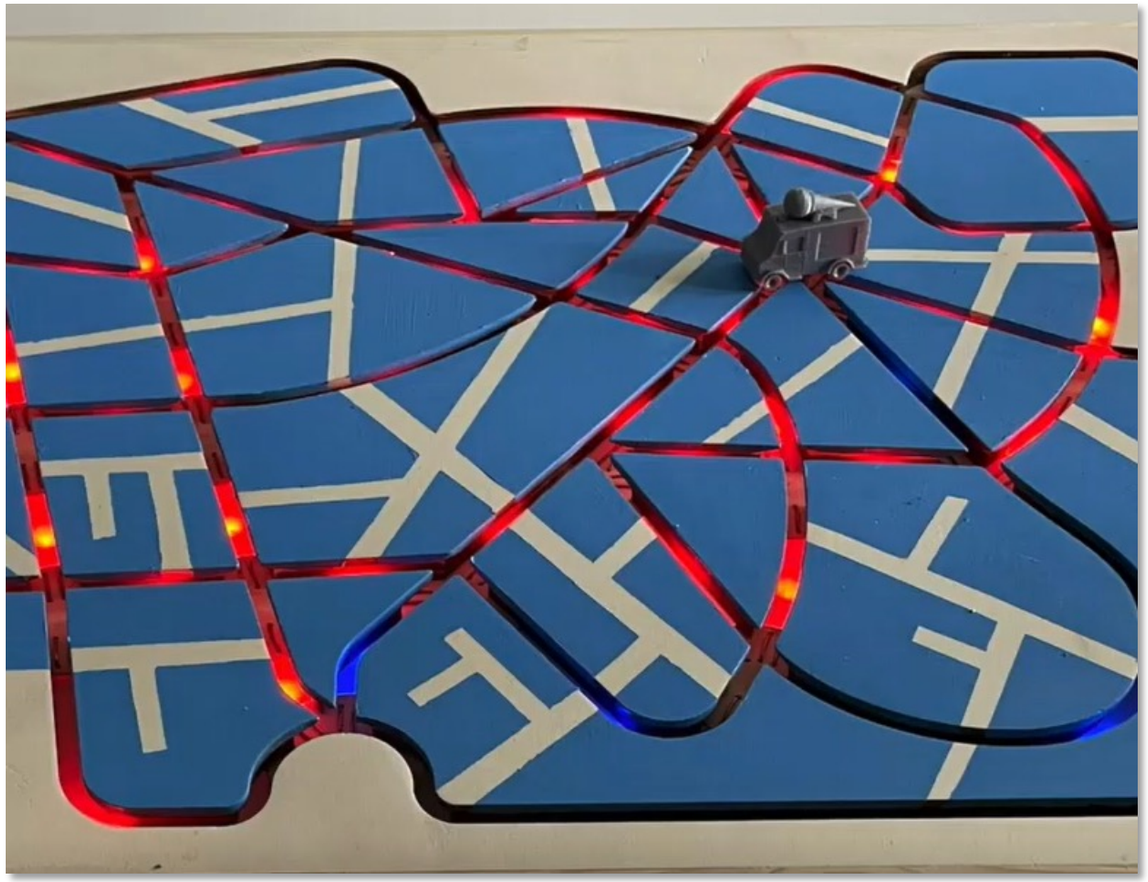
Videos



Finally:

Final Event:
15.6.2022
@FHNW:Windisch

If you want to see and probably play this year's games just let me know:

barbara.scheuner@fhnw.ch

Libraries

Java 17
- https://adoptium.net

Pi4J V2
- https://pi4j.com

JUnit
- https://junit.org/junit5/
- auch für Pi4J - Komponenten

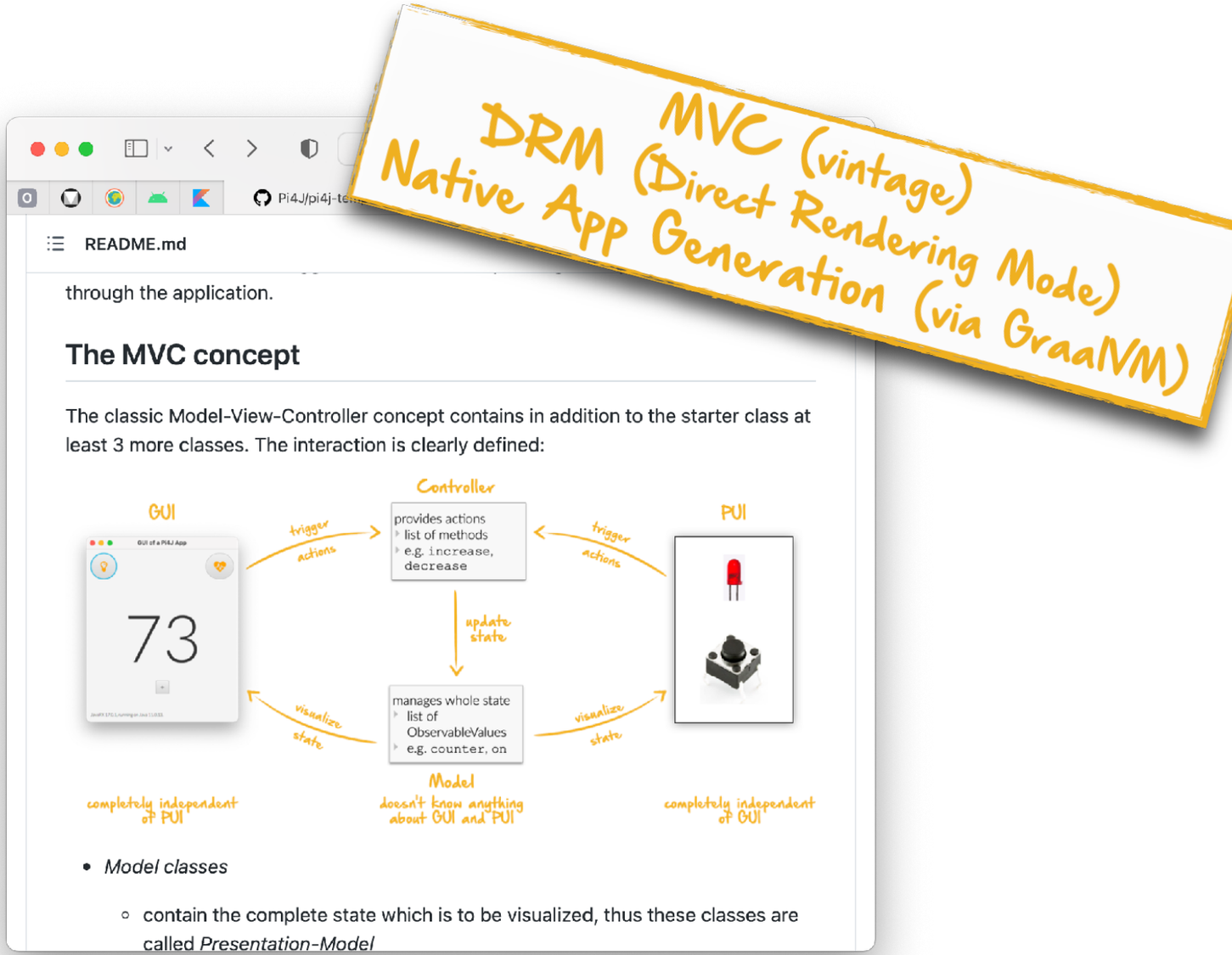
FXGL
- http://almasb.github.io/FXGL/

JavaFX 17
- https://openjfx.io

JavaCV
- https://github.com/bytedeco/javacv

MQTT Client
- https://github.com/hivemq/hivemq-mqtt-client

Template Project



https://github.com/Pi4J/pi4j-template-javafx