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Chernihiv Polytechnic National University

Towards the digitalization of university education

Volodymyr Kazymyr, prof,

Department of information and computer systems

https://stu.cn.ua/en/

panel discussion "International projects of Chernihiv Polytechnic: impact on the city, region, country", May 21, 2025, CPNU, Chernihiv

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Content

- **DIGITRANS Erasmus + project**
- **Stakeholders engagement**

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Erasmus+ Project 101127683 — DIGITRANS

Digital transformation of HEIs education process in Ukraine and Moldova for sustainable engagement with enterprises

https://stu.cn.ua/mizhnarodna-diyalnist/mizhnarodni-programy-ta-proekty/proyekt-digitrans/

The project implementation period: 01.12. 2023 – 30.11.2026

Project consortium includes:

1. RIGAS TEHNISKA UNIVERSITATE (RTU), Latvia – project coordinator.
2. UNIVERSITATEA DUNAREA DE JOS DIN GALATI (UDJG), Romania
3. ETHNIKO KAI KAPODISTRIAKO PANEPISTIMIO ATHINON (NKUA), Greece
4. **CHERNIHIV POLYTECHNIC NATIONAL UNIVERSITY (CPNU), Ukraine**
5. **KHARKIV NATIONAL AUTOMOBILE AND HIGHWAY UNIVERSITY (KhNAHU), Ukraine**
6. **LUTSK NATIONAL TECHNICAL UNIVERSITY (LNTU), Ukraine**
7. **SUBSIDIARY SNT UKRAINE (SNT Ukraine), Ukraine**
8. UNIVERSITATEA TEHNICA A MOLDOVEI (TUM), Moldova
9. UNIVERSITATEA DE STA ALECU RUSSO DIN BALTI (USARB), Moldova
10. UNIVERSITATEA DE STAT B. P. HASDEU DIN CAHUL (USC), Moldova
11. INTREPRINDEREA CU CAPITAL STRAIN DRA DRAEXLMAIER AUTOMOTIVE SRL (DRÄXLMAIER)

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The goal of the project

The DIGITRANS project aims to increase graduates' employability, support sustainable growth and jobs at Ukraine and Moldova

Chernihiv Polytechnic National University provides:

- Development of Sharing Remote Experiment Environment (SREE)
- Creation of Digital Learning Ecosystem (DLE) as a platform for on-line engineering education based on two virtual laboratories with physical equipment.
- Hosting and maintenance of SREE platform beyond the project
- Development of three study programs and six courses.
- Design of Digital Control Systems e-book elaboration.
- Development of methodical materials for virtual lab.
- Teaching staff and students.
- Arrangement of internship of students at the enterprises in Ukraine at SNT (Kyiv), Chernihiv IT-cluster (Chernihiv).

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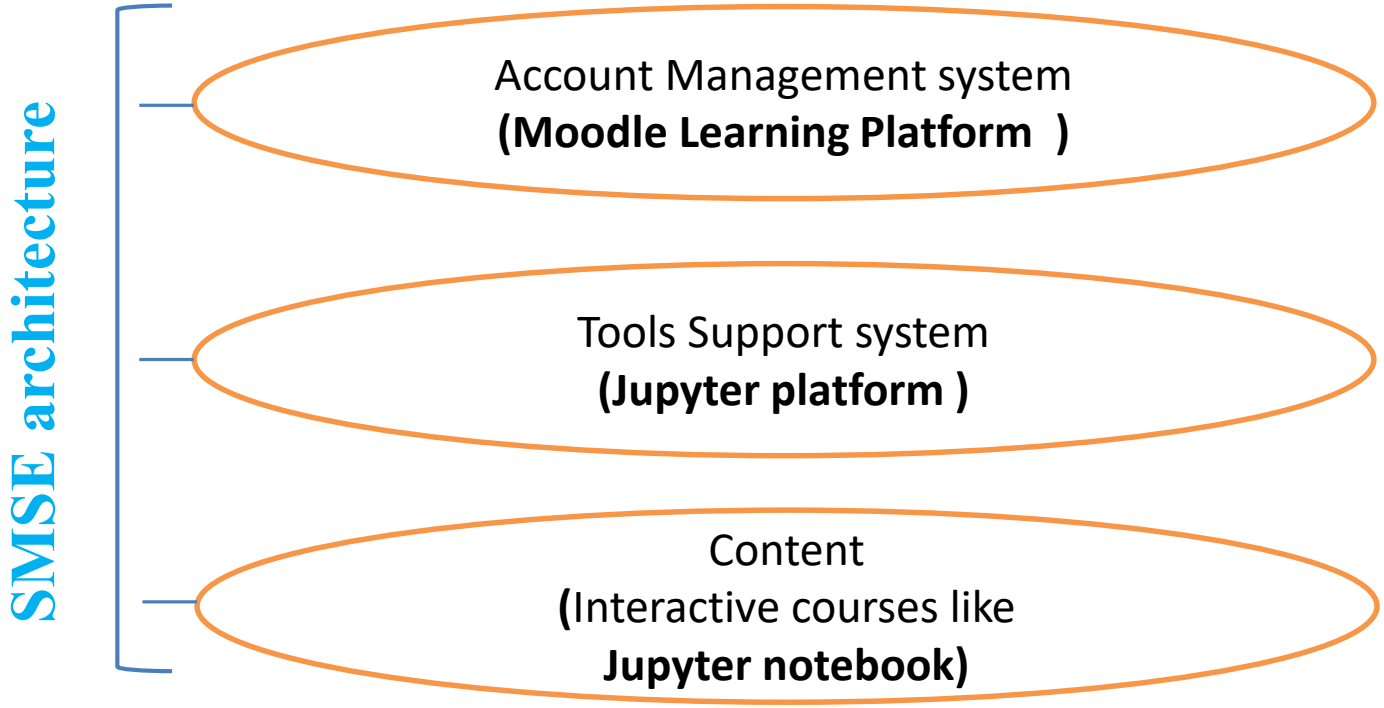
Shared Modelling and Simulation Environment (SMSE)

Developed during Erasmus+ project: **CybPhys - Development of practically-oriented student-centred education in the field of modelling of Cyber-Physical Systems (2019-2023)**

The aim of SMSE - to provide on-line training of student with practical skills in modelling and simulation of Cyber-Physical Systems using different program kernels

SMSE Idea – embedding Jupyter platform to Moodle



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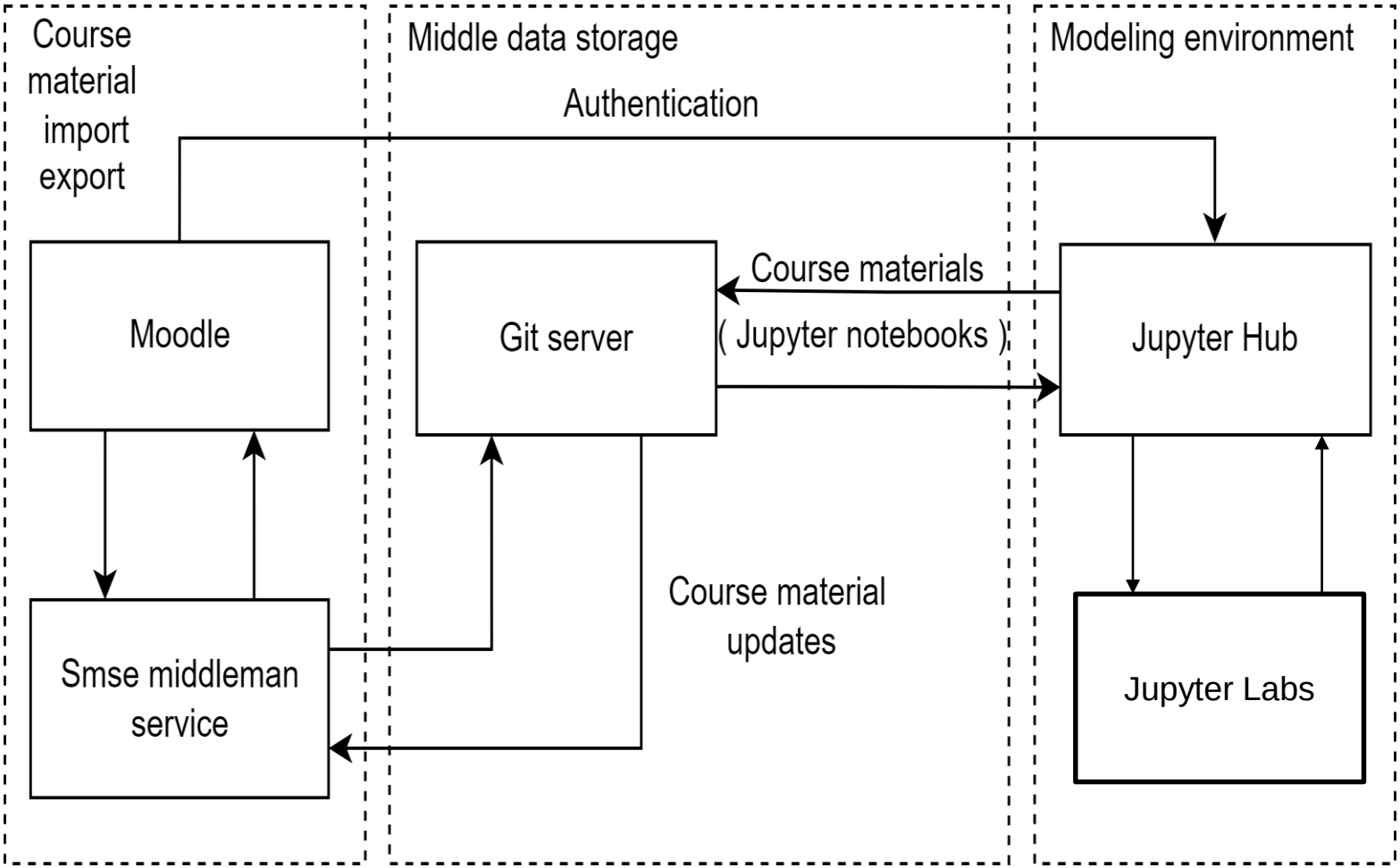
Shared Modelling and Simulation Environment (SMSE)

deployment diagram



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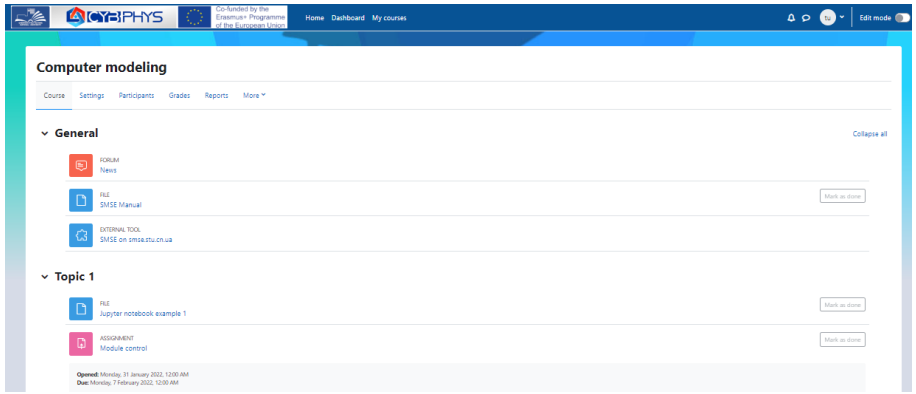
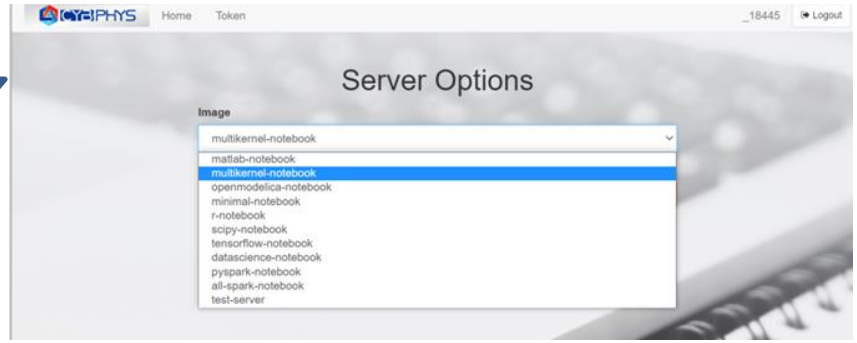
SMSE provides use of SOFTWARE TOOLS in on-line mode

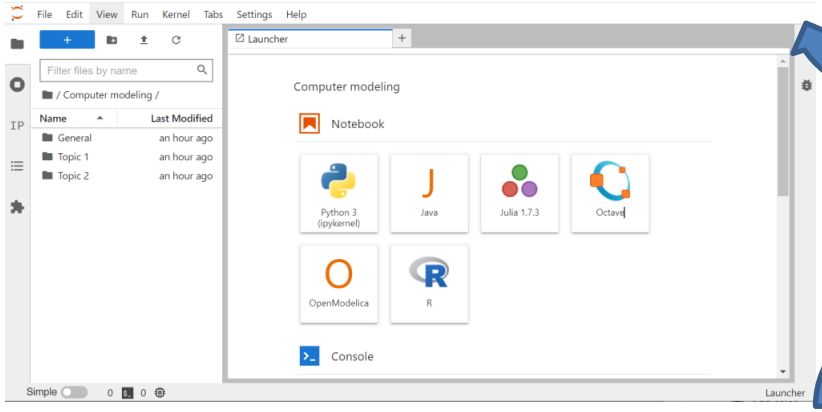
Moodle course



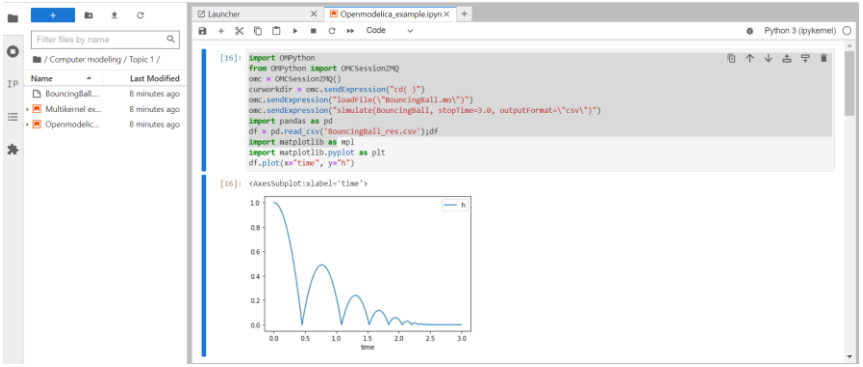
Select virtual server on Jupyter Hub



Start Jupyter Lab



Open and run Jupyter Notebook



Our aim - to expand it to HARDWARE DEVICES

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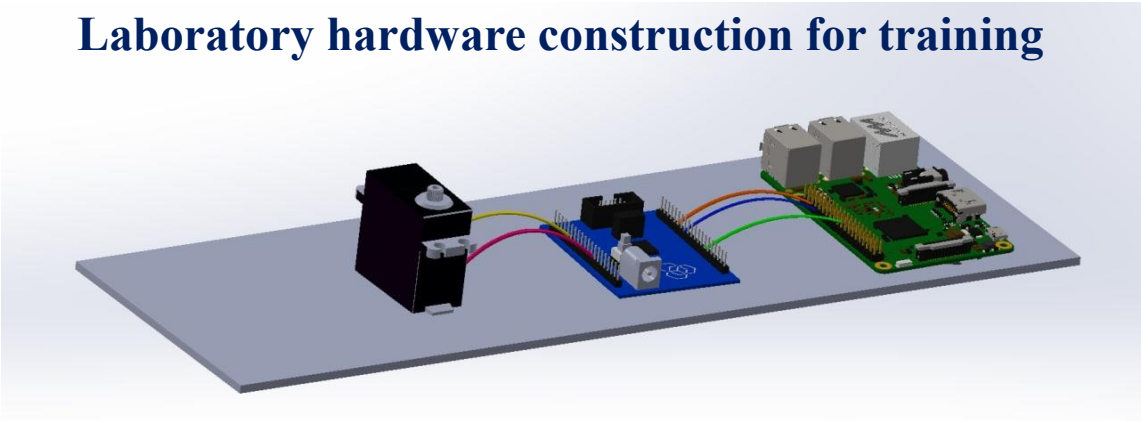
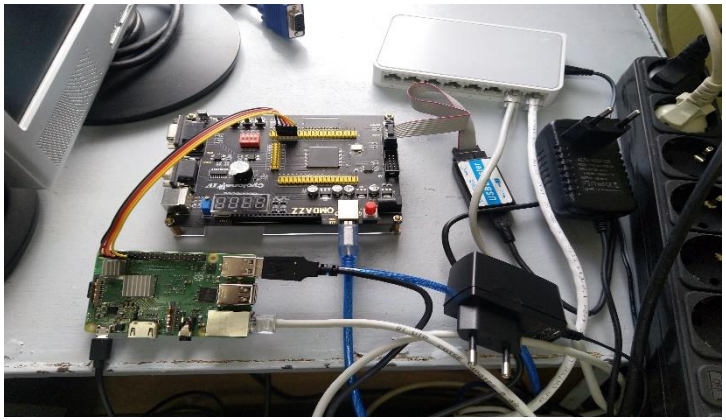
Sharing Remote Experiment Environment (SREE)

Laboratory hardware construction for training



Right to Left: Raspberry Pi, FPGA demo board , servo motor as a peripheral device

The aim of SREE is to access it via SMSE remotely in on-line mode



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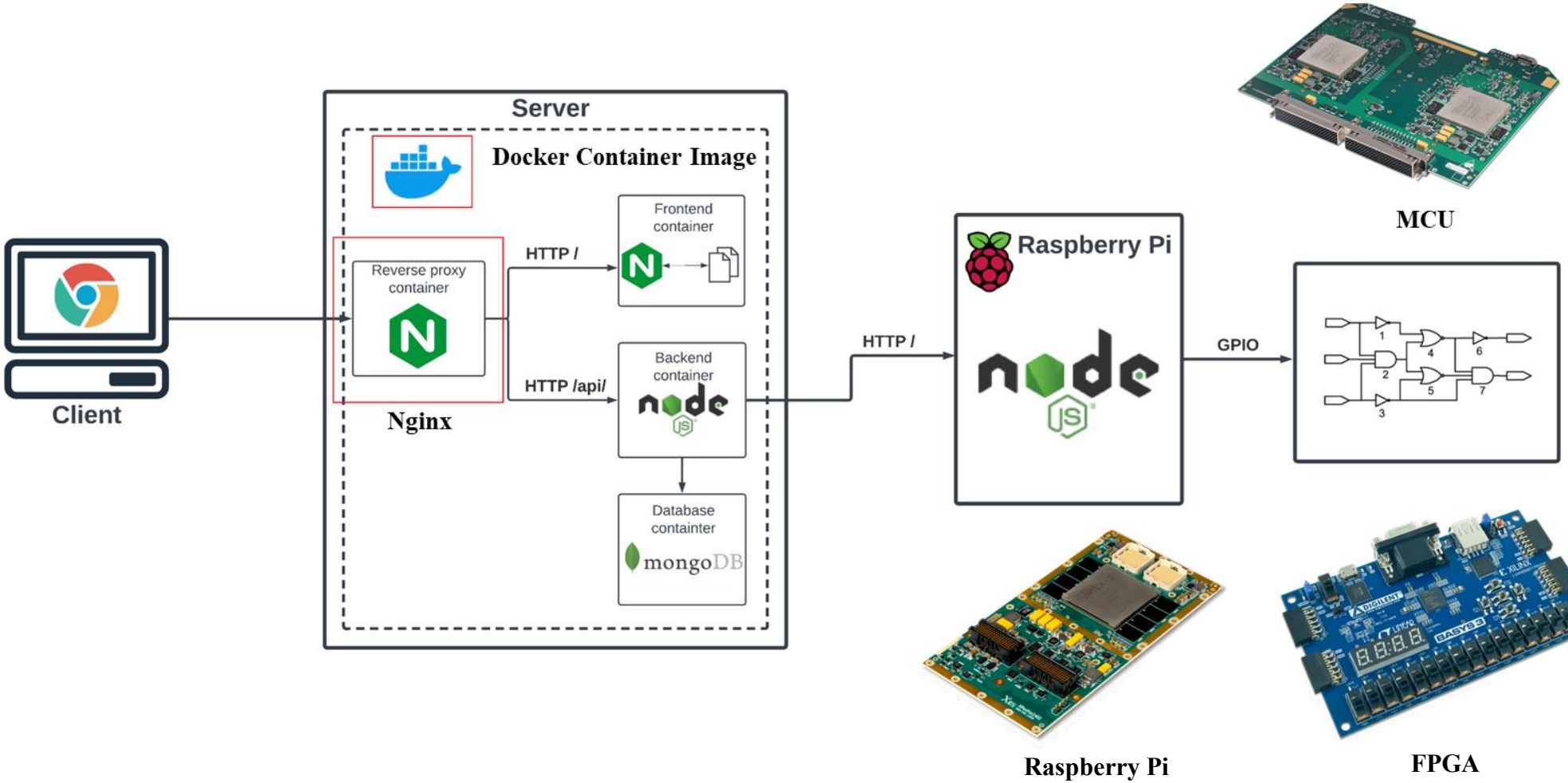
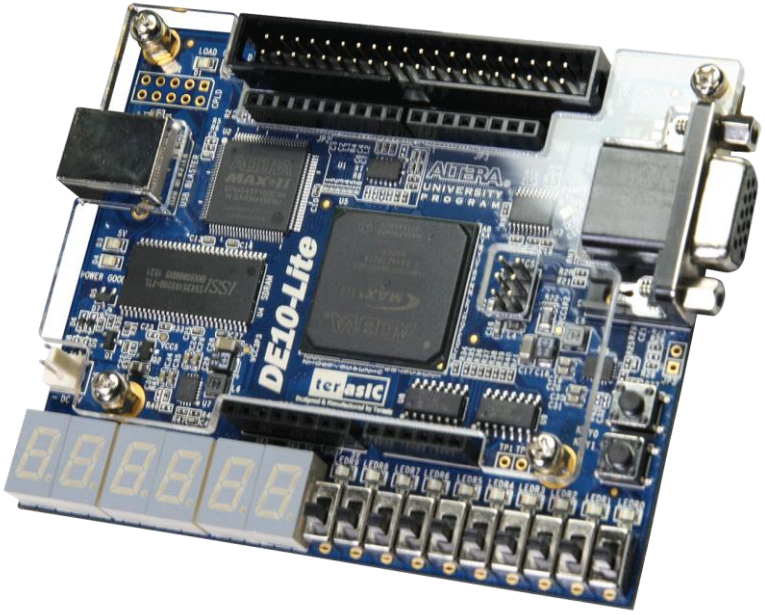
SREE platform concept



User task – MCU&FPGA programming with laboratory experiments

```
module up_counter(input clk, reset,
output[3:0] counter
    );
reg [3:0] counter_up;

always @(posedge clk or posedge reset)
begin
if(reset)
 counter_up <= 4'd0;
else
 counter_up <= counter_up + 4'd1;
end
assign counter = counter_up;
endmodule
```



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SREE MCU&FPGA labs

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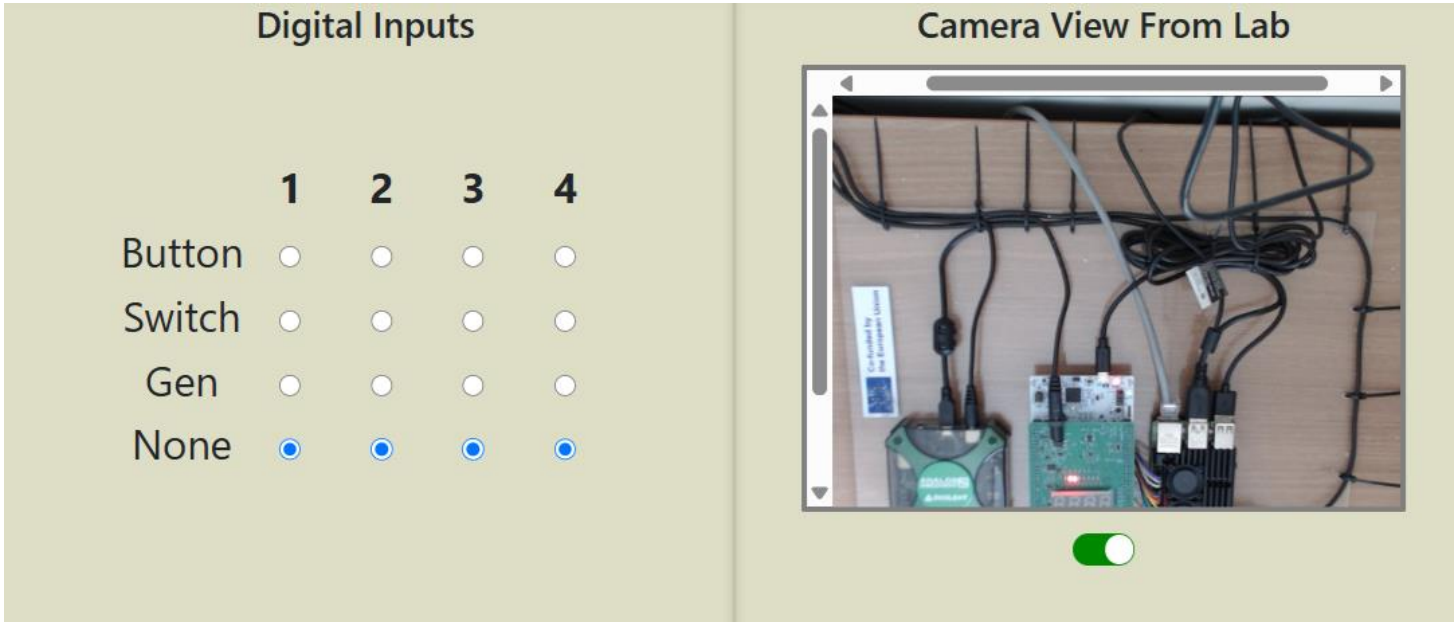
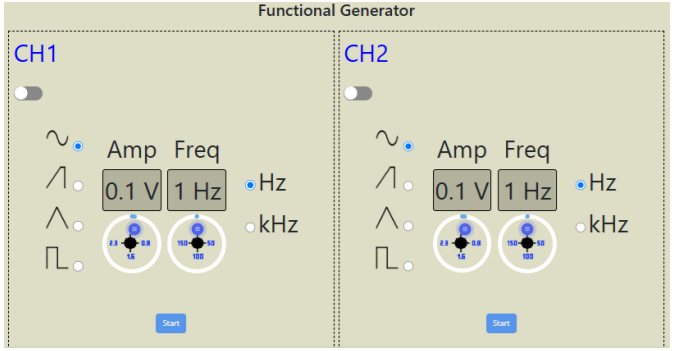
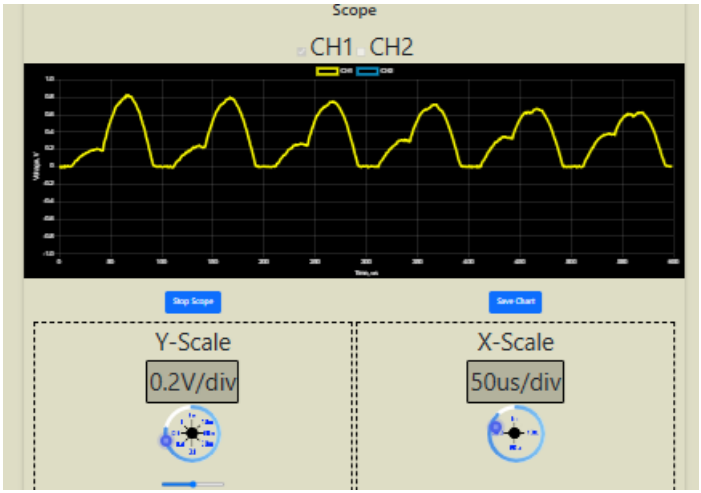
Control Panel View







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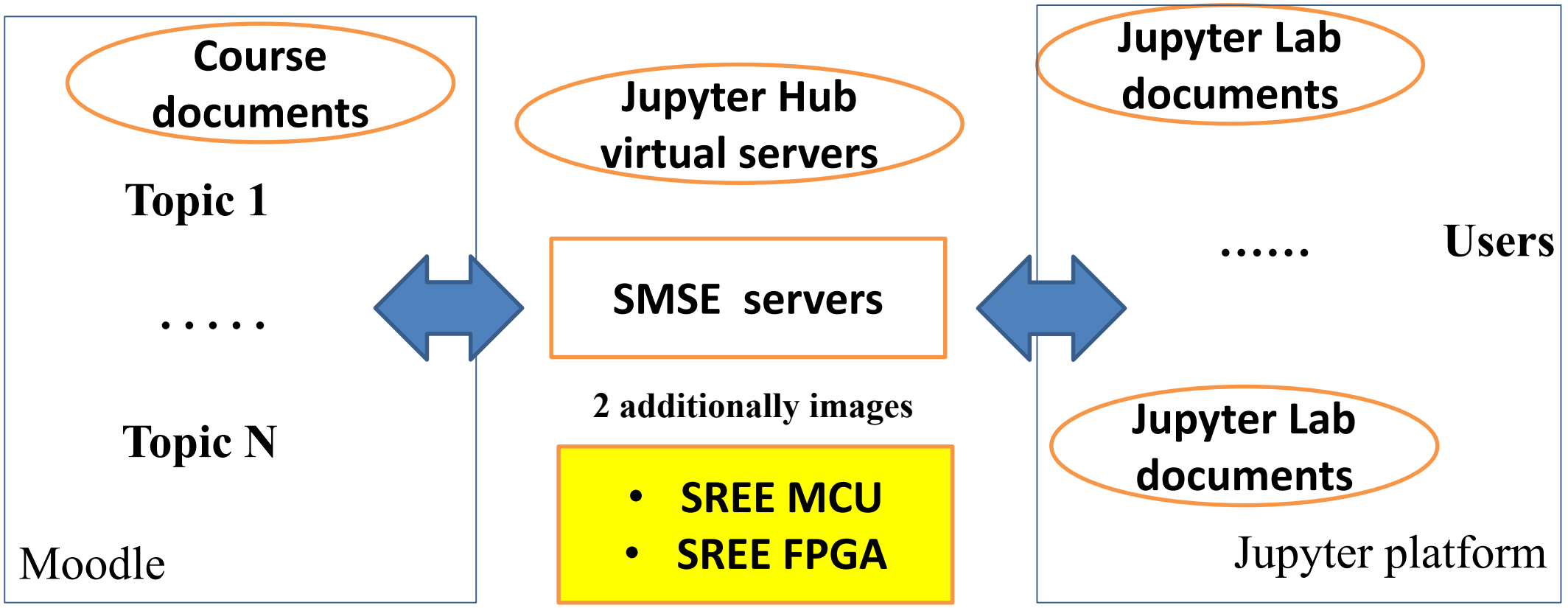
Integration of SREE with SMSE in DLE



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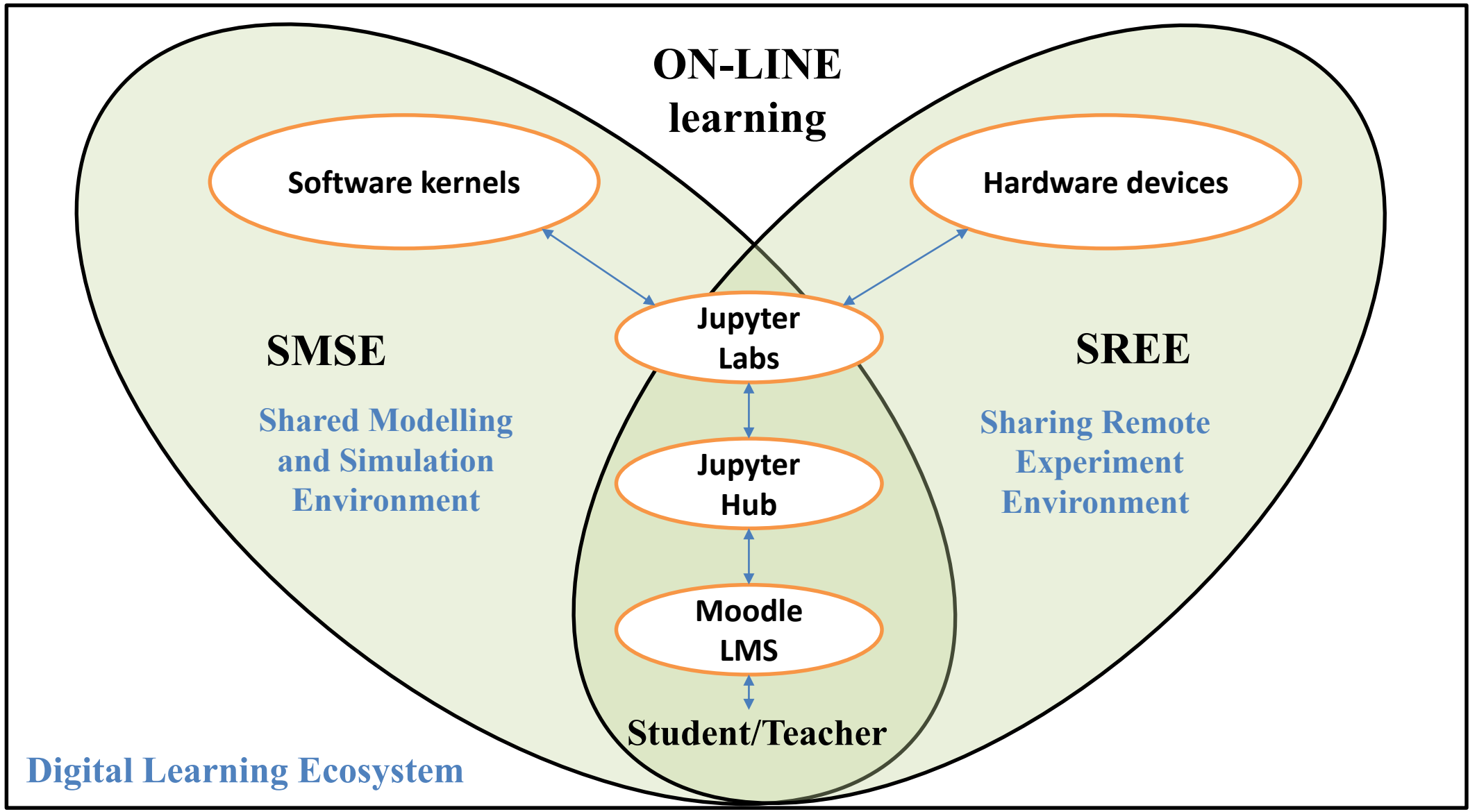
Digital Learning Ecosystem (DLE)



Digital Learning Ecosystem

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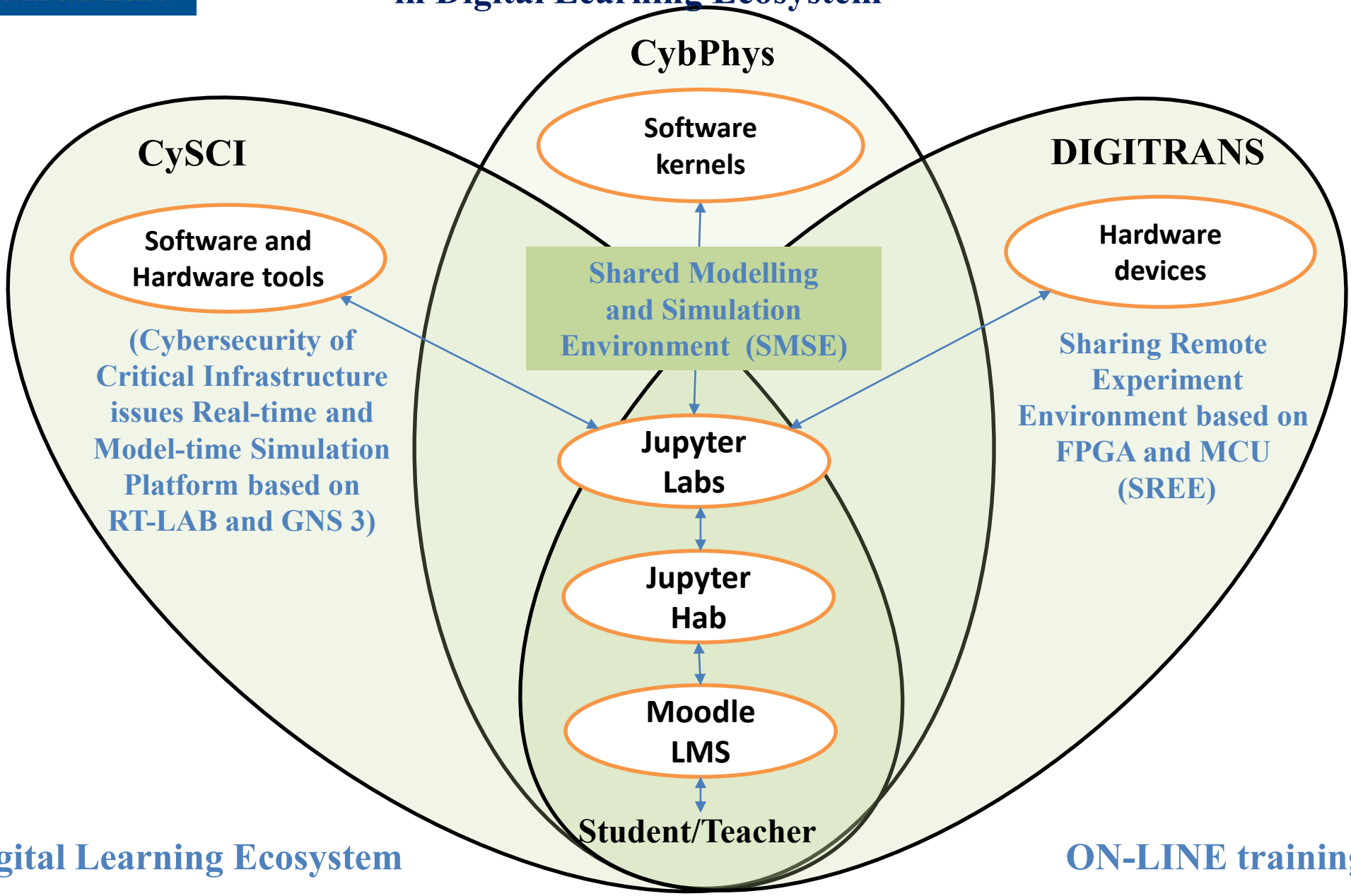
Integration of new project with previous projects in Digital Learning Ecosystem



Digital Learning Ecosystem

ON-LINE training

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Stakeholders engagement

- involvement in the educational process as teachers
- reviewing educational programs and courses' content
- conducting practical classes and internships
- organizing specialized training courses with CPTU DLE
- creating online platforms for training IT specialists
- and your suggestions

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