NextGEng

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International Cooperation Framework for Next Generation Engineering Students

Silvia Satorres Martínez

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About NextGEng

The International Cooperation Framework for Next Generation Engineering Students project, NextGEng, is an international consortium with the aim of creating new international teaching models in close collaboration with companies. It comprises three types of activities:

- **Training**. Experts in pedagogy and teacher training sustain the skill improvement of HEIs partners in new/innovative teaching methods.
- **Team Teaching**. Upgrade a set of engineering courses, belonging to the HEI partners curricula, in close collaboration with companies' partners.
- **CEL projects**. Type of projects where students learn by doing in an international and multidisciplinary environment.

www.nextgeng.eu

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NextGEng Partners

- Higher Education Institutions [HEI]
  - Co - Technical University of Cluj-Napoca (Romania)
    - Ciprian Lapusan (ciprian.Lapusan@mdm.utcluj.ro)
    - Ciprian Rad (Ciprian.rad@mdm.utcluj.ro)
  - P1 - JAMK University of Applied Science (Finland)
    - Anneli Kakko (anneli.kakko@jamk.fi)
    - Petri Luosma (petri.luosma@jamk.fi)
  - P2 - University Of Jaen (Spain)
    - Silvia Satorres Martínez (satorres@ujaen.es)
    - José Ignacio Jiménez González (jignacio@ujaen.es)
- Companies
  - P3 -Integración Sensorial y Robótica (Spain)
    - Arturo López (arturo.lopez@isr.es)
    - Juan Gómez (juan.gomez@isr.es)
  - P4 - Valmet Technologies (Finland)
    - Sampo Immonen (sampo.immonen@valmet.com)
  - P5 - Robert Bosch Cluj Plant (Romania)
    - Antoneta Dana State (Antoneta-Dana.State@ro.bosch.com)

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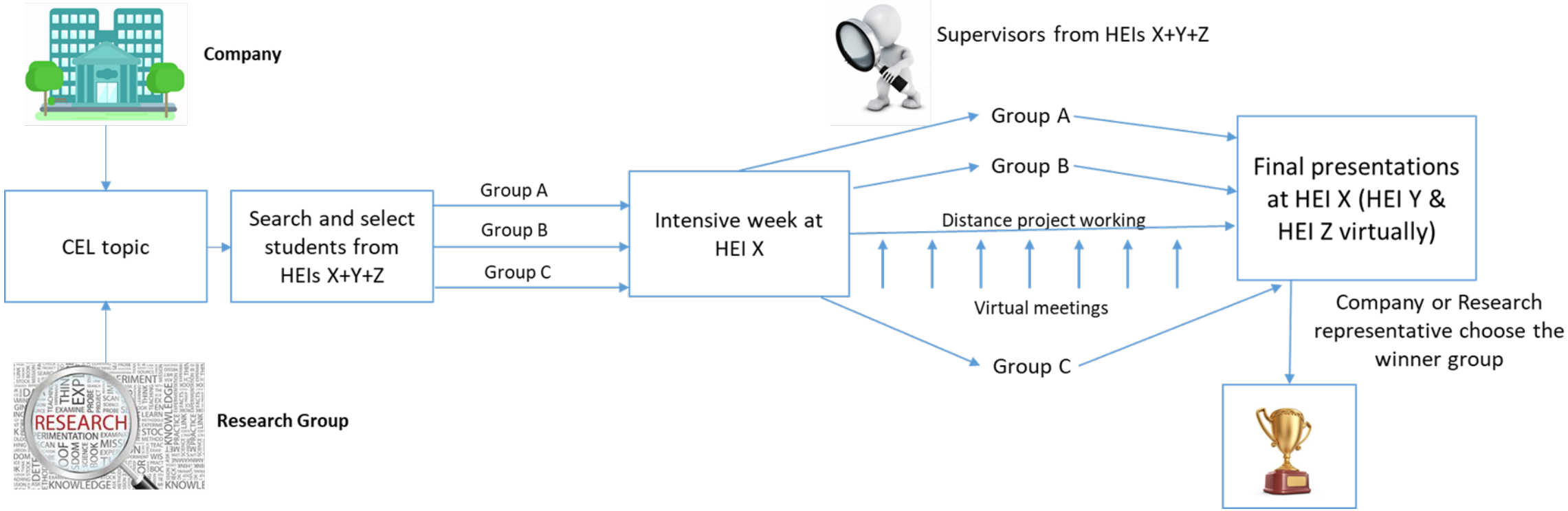
What is a CEL project?

- CEL projects focuses on bringing students, HEI staff and companies to work together. The idea is that students from different study programs and nationalities are brought together to form mixed groups in order to solve a research or industry topic.



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What is a CEL project?

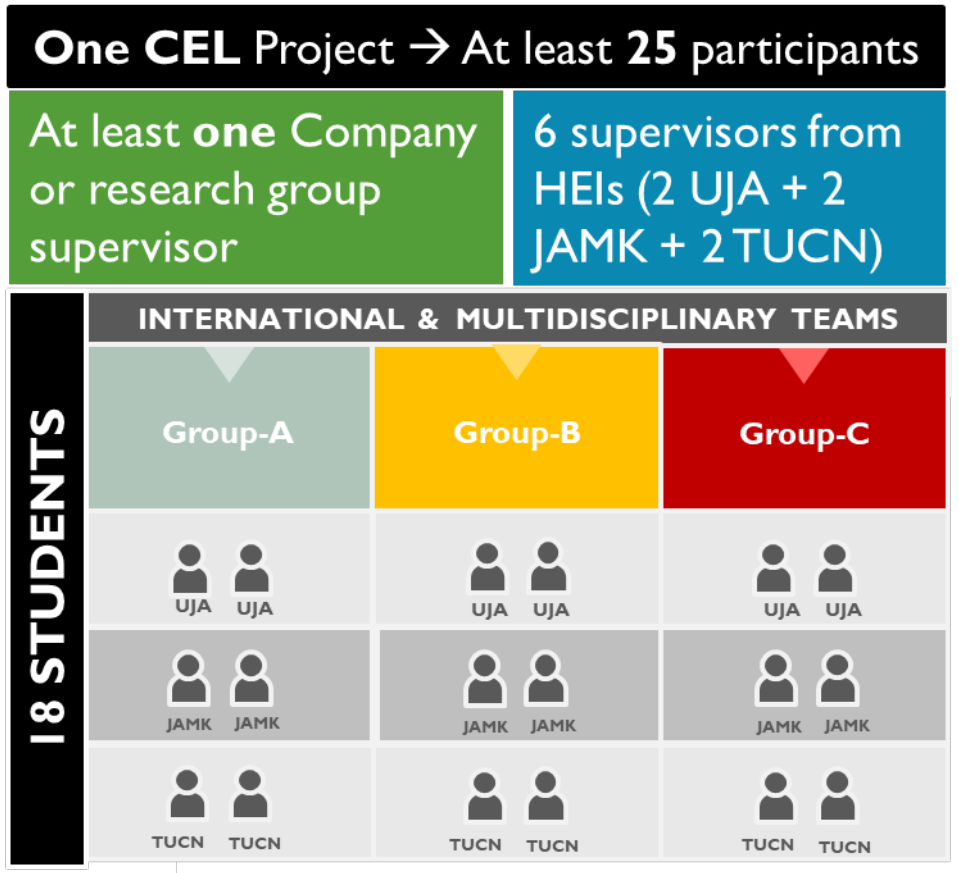
- Two rounds of CEL projects → 3 projects in each round
- At least 150 participants in total

ROUND	Company/research group representative	HEIs supervisors	Students
1	At least 3	18	54
2	At least 3	18	54

ROUND	Start Date	End Date
1	01/03/2023 (M6)	30/05/2024 (M20)
2	01/06/2024 (M21)	30/07/2025 (M34)

3 projects in 2024, spring semester (ISR+TUCN research group+Valmet)

3 projects in 2025, spring semester (UJA RG + Bosch + JAMK RG)



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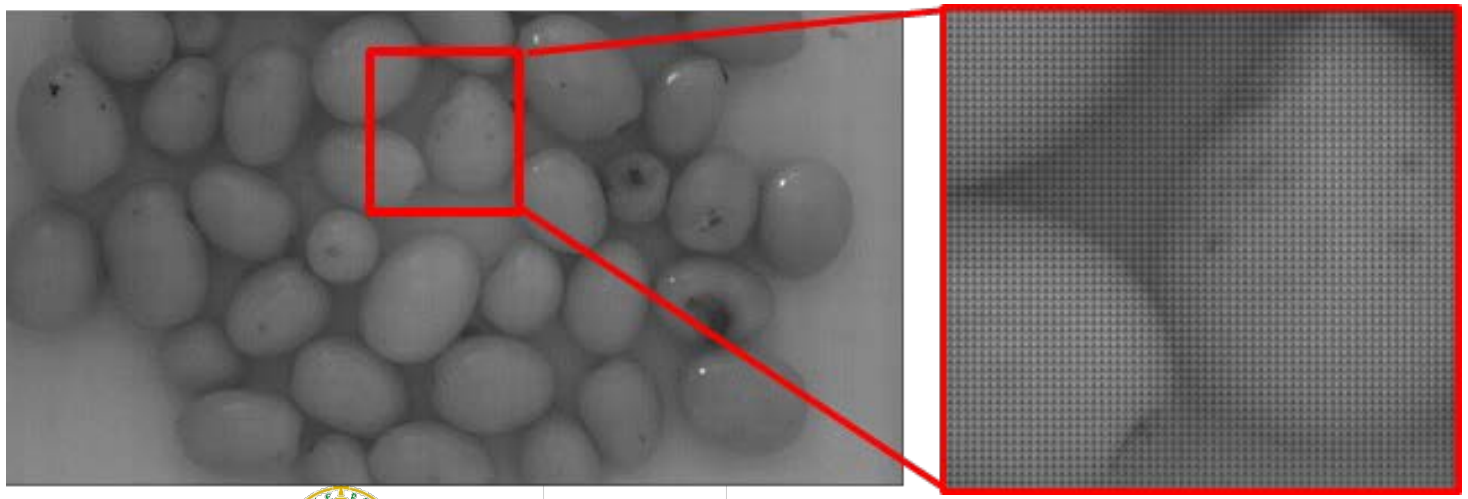
First round. CEL1 → ISR

https://isr.es/

- **Title**: Design of an olive quality control system
- **Objective**: Design and develop a station (machine vision system) able to classify the olive quality based on multispectral and or hyperspectral images of olive fruits.
- **Student tasks**:
  - Project planning.
  - Acquisition station CAD design.
  - Development of computer vision algorithms for quality assessment
- **Student profile**: Multidisciplinary



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First round. CEL2 → TUCN RG

Research Group of the
Applied Mechatronics
Research Laboratory

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https://www.utcluj.ro/

- **Title**: 3-axes GANTRY ROBOT (3GR)
- **Objective**: Design a 3-axes GANTRY ROBOT subject to the following requirements:
  - the movement along the X, Y, Z axes is carried out using electric motors mounted on the fixed base of the robot (they must not be mounted on moving parts)
  - the transmission of the movement for the axes (X, Y, Z) is done using toothed belts
  - the robot workspace is 300 x 400 x 200 mm3 (X, Y, Z)
  - on the Z axis a gripper is attached; the gripper must be able to manipulate workpieces with cylindrical geometry: 30 mm (diameter), 30 (height), 50 grams (mass); the gripper can be operated by any technology
- **Student tasks:**
  - Conceptual design of 3GR and gripper
  - Virtual prototyping and validation
  - Result analysis: benefits and drawbacks
- **Student profile**: Multidisciplinary (mechanics, robotics, control etc.)

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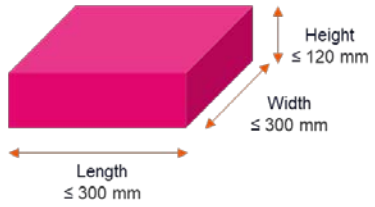
First round. CEL3 → Valmet

Valmet

https://www.valmet.com/

- **Title**: Design of a test object for a pressing-based manufacturing process
- **Objective**: Conceptualizing and designing a “test object” for a pressing-based manufacturing process. The knowledge from such tests can be used to adjust process parameters and mechanics for totally new concept of pressing wood-based materials
- **Student tasks**:
  - Project planning
  - Working with test object for a pressing-based manufacturing process
  - 3D models and/or concept-level technical drawings
  - Hand-drawn or digital illustrations (e.g. PowerPoint, Photoshop, Paint) or low- to medium-fidelity physical prototypes made from materials such as wood, plastic (3D-printing) or modelling clay
- **Student profile**: Multidisciplinary



Valmet

Minimum letter height ~3 mm

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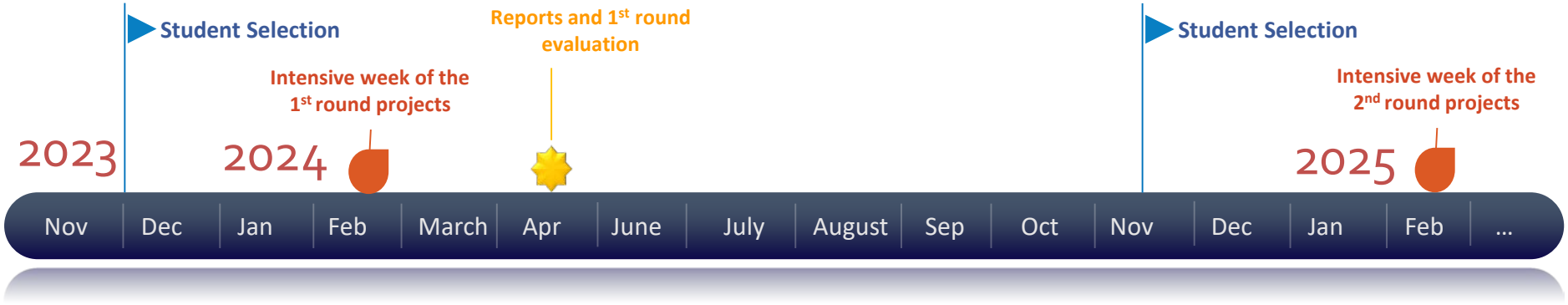
Schedule

Week 7 → Intensive week

Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week 15
Week 16

DISTANCE WORK

Week 17 → Final presentations



February

Wk	Su	Mo	Tu	We	Th	Fr	Sa
5					1	2	3
6	4	5	6	7	8	9	10
7	11	12	13	14	15	16	17
8	18	19	20	21	22	23	24
9	25	26	27	28	29		

March

Wk	Su	Mo	Tu	We	Th	Fr	Sa
9						1	2
10	3	4	5	6	7	8	9
11	10	11	12	13	14	15	16
12	17	18	19	20	21	22	23
13	24	25	26	27	28	29	30
14	31						

April

Wk	Su	Mo	Tu	We	Th	Fr	Sa
14		1	2	3	4	5	6
15	7	8	9	10	11	12	13
16	14	15	16	17	18	19	20
17	21	22	23	24	25	26	27
18	28	29	30				

IMPORTANT DATES BEFORE THE INTENSIVE WEEKS

20.11.2023 Opening time for students application
24.11.2023 Deadline for student application time
04.12.2023 – 15.12.2023 Student selection time
15.01.2024 - 19.01.2024 Booking hotels and flight tickets (CEL project supervisors at each HEI)

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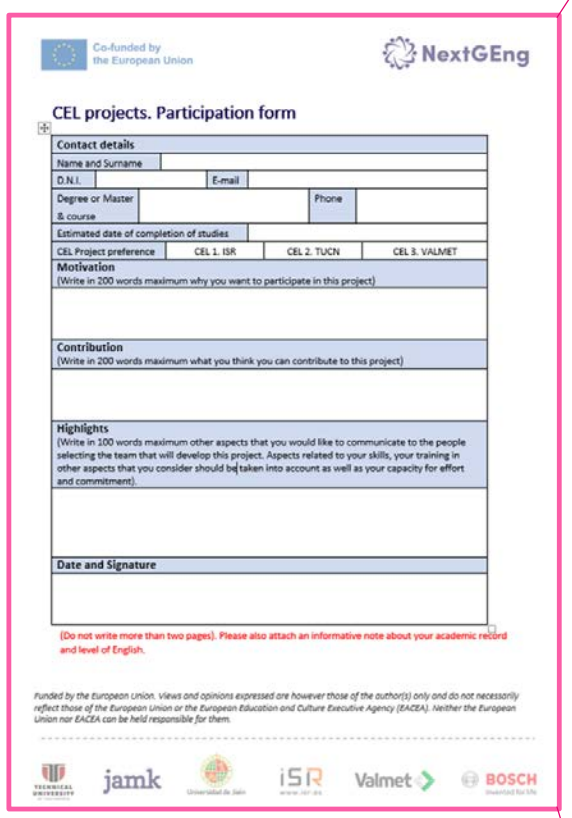
How to apply



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CEL projects. Participation form

Contact details			
Name and Surname			
D.N.I.		E-mail	
Degree or Master & course		Phone	
Estimated date of completion of studies			
CEL Project preference	CEL 1. ISR	CEL 2. TUCN	CEL 3. VALMET
Motivation (Write in 200 words maximum why you want to participate in this project)			
Contribution (Write in 200 words maximum what you think you can contribute to this project)			
Highlights (Write in 100 words maximum other aspects that you would like to communicate to the people selecting the team that will develop this project. Aspects related to your skills, your training in other aspects that you consider should be taken into account as well as your capacity for effort and commitment).			
Date and Signature			

(Do not write more than two pages). Please also attach an informative note about your academic record and level of English.

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Contact details			
Name and Surname			
Identity card		E-mail	
Degree or Master & course		Phone	
Estimated date of completion of studies			
CEL Project preference	CEL 1. ISR	CEL 2. TUCN	CEL 3. VALMET
Motivation (Write in 200 words maximum why you want to participate in this project)			
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Date and Signature			

(Do not write more than two pages). Please also attach an informative note about your academic record and level of English.

Fill in the participation form:

20/11/2023 – 24/11/2023

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How to apply

REQUIREMENTS

- NOT finish your studies before **June 2024**
- High level of English (B2 or higher recommended)
- Ability to work in a team
- Basic knowledge of the chosen CEL topic

BENEFITS OF DOING A CEL PROJECT

- Certification of the activity
- Possibility of doing the bachelor thesis in the CEL subject
- Multidisciplinary cooperation
- International cooperation
- Solving a case of study from Industry
- Solving a case of study of a Research Group

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Thank you!