

Working together for a **green**, **competitive** and **inclusive** Europe

21-COP-0019

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This project has been funded with support from the SEE 2014-2015 financial mechanism. Its content (text, photo, video) reflects the views only of the authors and not the official opinion of the Program operator, national contact point or Financial Mechanism Office.

Working together for a **green**, **competitive** and **inclusive** Europe

Content

- 1. Main aims and details of the EMERALD project.**
- 2. Main activities of the EMERALD project. General presentations of the Intellectual Outputs. Most important KPIs of the EMERALD project.**
- 3. Main actions of the EMERALD project. Summarizing of the planned actions**

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Working together for a **green**, **competitive** and **inclusive** Europe

1. Main aims and details of the EMERALD project

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EMERALD project – EEA grants financed in the frame of SEE mechanism

The National Agency for Community Programmes in the Fields of Education and Vocational Training

HOME GENERAL INFORMATION WHO CAN APPLY RECENT NEWS PROJECTS APPLY NOW EN RO

Selection Results – Cooperation projects

Round 2021 – APPROVED

No.	Reference number	Project title	Project Promoter	Town	Partner in Donor State	Final score	Requested budget (EUR)	Approved budget (EUR)
1	21-COP-0019	European network for 3D printing of biomimetic mechatronic systems	Universitatea Tehnica din Cluj-Napoca	Cluj-Napoca	University of Agder, NO	115	199,950	198,810
2	21-COP-0004	Bringing Real Life into Virtual Classrooms	Universitatea de Vest din Timisoara	Timisoara	Norwegian University of Science and Technology, NO	110	94,237	89,353

Total Budget:
198.810 EUR

Total Duration:
2 years

Starting date:
15.02.2022

Ending date:
30.09.2023

Education, Scholarships, Apprenticeships and Youth Entrepreneurship Programme financed by the EEA Financial Mechanism (2014 – 2021)

Coordinator



TU Cluj-Napoca (RO)

Partners from Higher Education institutions



University of Agder (NO)



Polytechnic University of Bucharest (RO)



Poznan Univ of Technology (PL)



(SK)



Scientific background and experience used to define the main aims and expected outcomes of the EMERALD project

Providing **teaching resources and methods for professors** coming from the Higher Education institutions that are interested to find ways in **providing their students** relevant knowledge, skills and competences in **conceiving, developing and realizing of different biomimetic mechatronic systems by 3D printing methods for people with special needs (amputated arms)**, such as:

- EMERALD **support e-courses** related to the objective (based on one curriculum defined by the EMERALD consortium)
- EMERALD **e-toolkit manual** for digital learning (correlated with the support courses)
- EMERALD **e-learning virtual laboratory** platform for developing, producing and testing of biomimetic mechatronic systems made by 3D printing (in correlation with the support e-courses and the e-toolkit manual)
- EMERALD **e-case studies** for project based learning method used in developing, testing and manufacturing of new types of biomimetic mechatronic systems made by 3D printing technologies for people with special needs (amputated arms)

The advantages of the EMERALD methods will be that the **professors and students will gain knowledge and competences related to the developing, designing, producing of biomimetic mechatronic systems made by 3D printing methods and testing of developed systems that are aimed to support people with special needs (amputated arms) in the end.**

Background of the EMERALD project interdisciplinary domains / interconnections with previous EEA grants



ARM NEUROPROSTHESIS
EQUIPED WITH ARTIFICIAL SKIN AND SENSIC



ARM NEUROPROSTHESIS EQUIPED WITH ARTIFICIAL SKIN AND SENSORIAL FEEDBACK - ARMIN

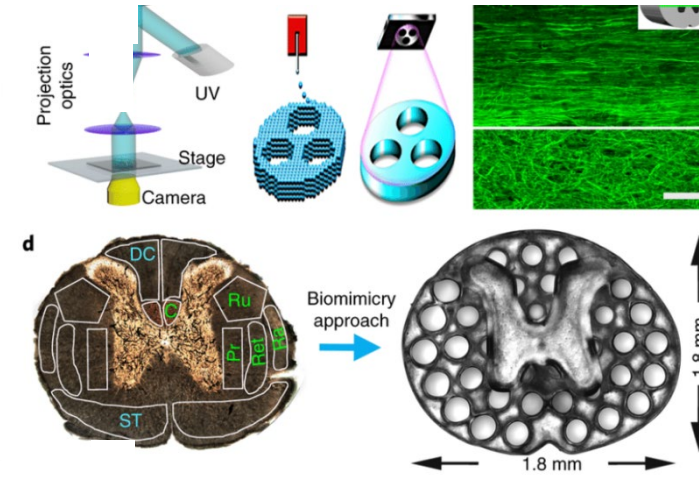
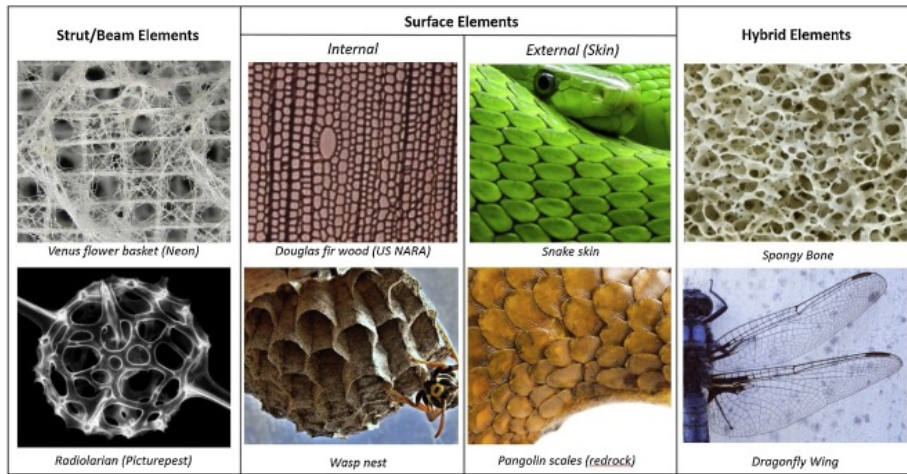
Partners: **UPB**, National Institute of Microtechnology, Clinical Hospital of Floreasca, Medical Science Academy, Areus Technology, University of South-Eastern Norway, budget approx. 1.510.000 euro



The main objective of the project was to design and fabricate the command and control system of a neuroprosthesis that integrates the motion algorithms with the command and sensory signals. The sensorial feedback system is re-establishing the sensorial function of amputated arms and is able to achieve high precision movements when handling objects with the neuroprosthesis. To design and fabricate a set of regenerative neural bio-interfaces for selecting and stimulating (from ulnar and median nerves), the sensory axons considered being in charge with the transmission of tactile sensations from palm and fingers, before amputation has been developed. These bio-interfaces allow the tactile signals from the fingers and palms of the neuroprosthesis to be transmitted through these sensory axons. In this way the patient actually feels tactile feedback sensations when handling objects with neuroprosthesis. To mount a fully functional neuroprosthesis on the patient stump, it was needed to be connected to the peripheral nervous system of the patient. For delivering the arm neuroprosthesis prototype (implanted in the patient stump and WiFi connected to the prosthesis hand), most of lost arm and hand functions were achieved by 3D printing.



**Background of the EMERALD project
interdisciplinary domains / innovative things that are to be considered**

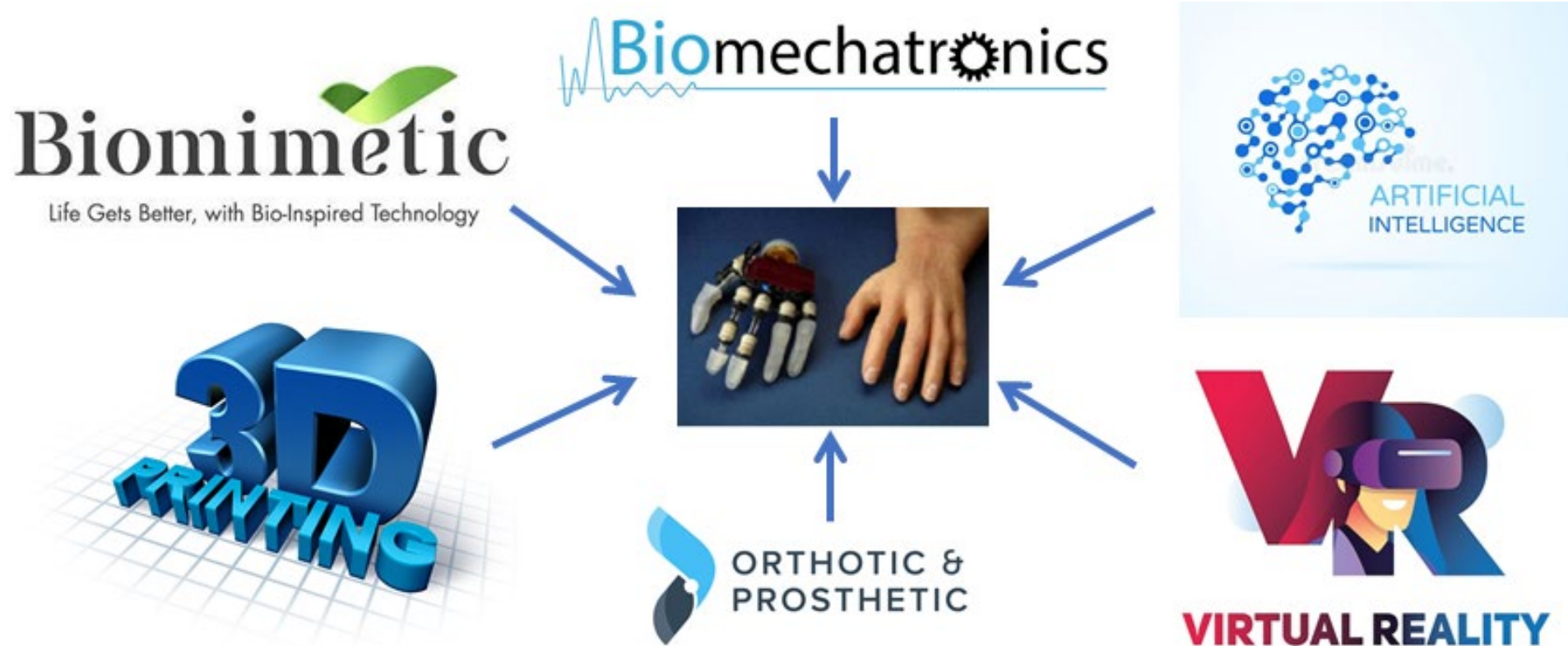


Biomimetic structures to be materialized by 3D printing methods

Definition: Biomimetic (biomimicry) refers to human-made processes, substances, devices, or systems that imitate nature. The field is of top interest to researchers involved in 3D printing, nanotechnology, robotics, artificial intelligence, smart (intelligent) materials, medicine, industrial applications (aerospace industry, automotive, etc).

European Network For 3D Printing Of Biomimetic Mechatronic Systems

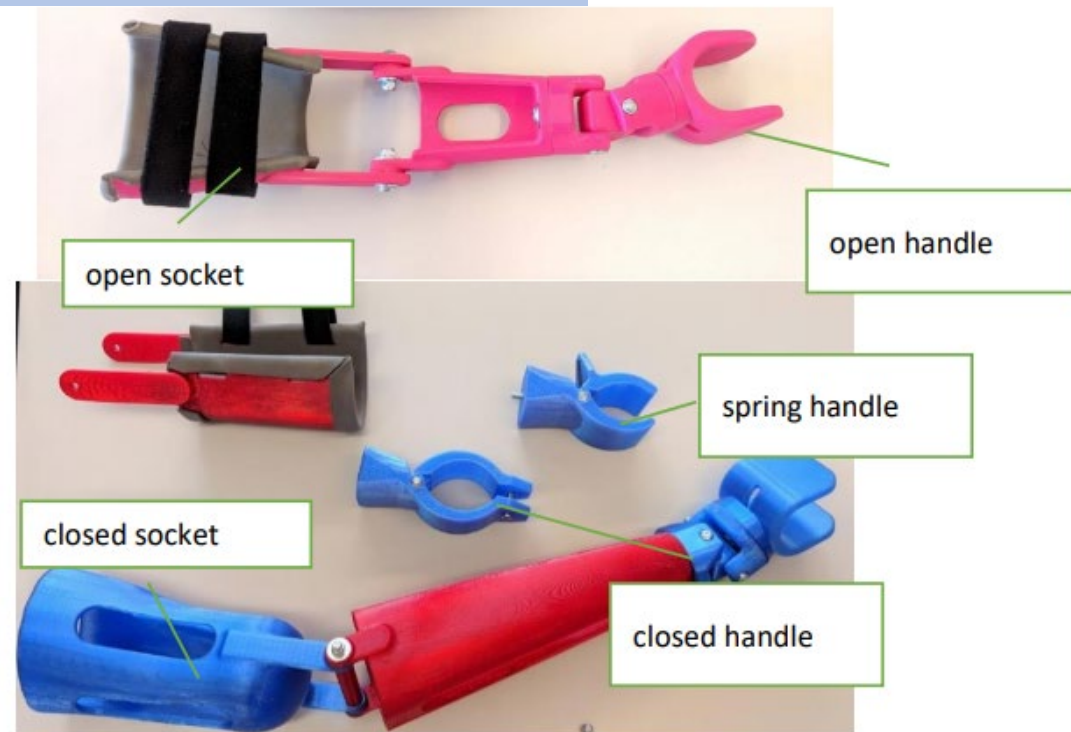
Defining of the of the project idea and main concept



Case studies proposed to be solved in the EMERALD project



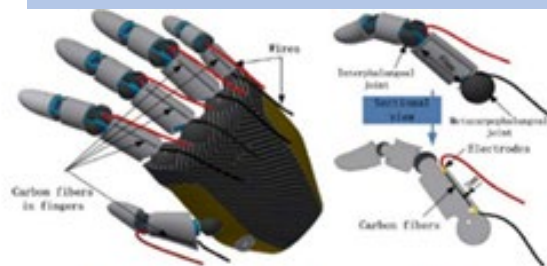
Bicycle prosthesis used by various patients [PUT project report]



Components of the bicycle prosthesis [PUT project report]

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Case studies proposed to be solved in the EMERALD project



Universal prosthetic hand with mechanical fingers [PUT materials]



Corrective WHOs for patients with shoulder dystocia [PUT project report]



Orthyo sensors available at PUT [orthyo.com]



3D printed waterproof AFOs for patient with severe spina bifida



Therapy using VR applications (gamification)

Target audience (groups) / relevant stakeholders to be involved in the project)

The EMERALD project proposal is addressing to the professors and students that are interested in gaining knowledge and competences related to the developing, designing, producing of biomimetic mechatronic systems made by 3D printing methods and testing of developed systems that are aimed to support people with special needs (with amputated arms). They are the main target audience / to whom the project is being addressing to.

People with special needs are beneficiaries (end users) of developed solutions in the EMERALD project.

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Target audience (groups) / relevant stakeholders to be involved in the project

Conceiving of the **European network for 3D printing of biomimetic mechatronic systems** is one objective of the project. This will be done by finding the proper ways to involve the major stakeholders in the project (Public organizations, Health / Medical institutions, 3D printing companies, SMEs, clusters), etc through the activities organized in the project (multiplier events, summer school activities). Stakeholders are the key actors that might benefit of the project results.



TUCN – strategic partner within the European University of Technology EuT+ (<https://www.univ-tech.eu/>) and ERASMUS+ programs

Involving of local authorities

Attracting of most important companies and organizations that are acting in 3D printing / bio-mechatronics sector – EMERALD aim is to build an EUROPEAN Network also

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2. Main activities of the EMERALD project. General presentations of the Intellectual Outputs. Most important KPIs of the EMERALD project

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Quick overview of the Intellectual outputs related to the EMERALD project

IO1	EMERALD e-book for developing of biomimetic mechatronic systems	TUCN
IO2	EMERALD e-toolkit manual for digital learning in producing biomimetic mechatronic systems	<i>University of Agder</i>
IO3	EMERALD e-learning VR / AR platform for programming and using biomimetic mechatronic systems	<i>Bizzcom</i>
IO4	EMERALD e-case studies for project based learning method used in developing, testing and manufacturing of new biomimetic mechatronic systems by 3D printing technologies	<i>Poznan University of Technology</i>

European Network For 3D Printing Of Biomimetic Mechatronic Systems

I01 - EMERALD e-book for developing of biomimetic mechatronic systems

Start Date : 15 Feb 2022

End Date : 31 Jul 2022

Responsible: Technical University of Cluj-Napoca

The main aim of the I01 is to provide the proposed **CURRICULUM** for increasing the application of research results in regenerative medicine, human-machine interfaces, advanced robotics, new paradigms in biomimetic mechatronic systems, etc. The curriculum comprise **8 MODULES**.

Open
access
on the
platform?

Content?

Template?

Report?

MODULES	RESPONSIBLES
1. Computer Aided Design (CAD)	PUT
2. Computer Aided Engineering (CAE)	TUCN
3. Computer Programming	UiA
4. Virtual Reality / Augmented Reality	PUT & BIZZCOM
5. Sensors and Electronics	UPB
6. Bio-Mechatronics	UiA
7. 3D printing and Rapid Tooling methods	TUCN
8. Intelligent (smart) materials	UPB

Starting:
15.02.2022

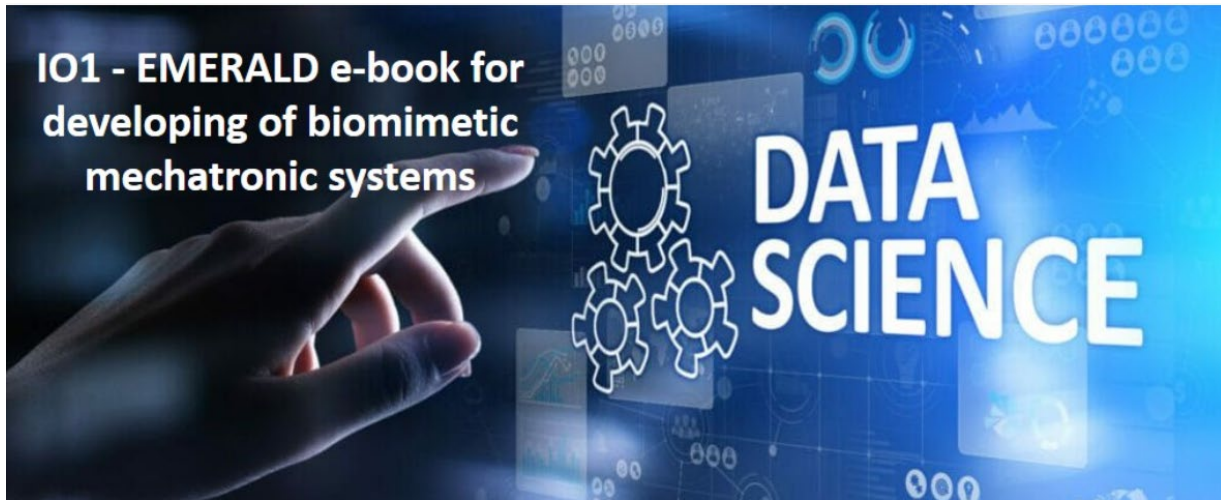
Deadline:
31.07.2022

For each module according to the skills and competences of the EMERALD partners consortium, from the **Technical team there will be nominated 1-2 responsible persons** which will be in charge with one module and will need to provide course support for the particular module courses necessary for **producing biomechatronic / biomimetic systems**.

Intellectual Output – IO1

POSTED ON 2022-09-30 BY RĂZVAN PĂCURAR

8 course modules comprising 25-30 pages each were finalized by the EMERALD consortium and are available on the EMERALD project website (platform)



- Module 1: Computer Aided Design (CAD)
- Module 2: Computer Aided Engineering (CAE)
- Module 3: Computer Programming
- Module 4: Virtual Reality / Augmented Reality
- Module 5: Sensors and Electronics
- Module 6: Bio-Mechatronics
- Module 7: 3D printing and Rapid Tooling methods
- Module 8: Intelligent (smart) materials

EMERALD

The Education, Scholarships, Apprenticeships and Youth
Entrepreneurship
EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC
MECHATRONIC SYSTEMS

MODULE 1 – CAD

Project Title	European network for 3D printing of biomimetic mechatronic systems 21-COP-0019
Output	IO1 - EMERALD e-book for developing of biomimetic mechatronic systems
Module	Module 1 – CAD
Date of Delivery	July 2022
Authors	Filip GÓRSKI, Magdalena ŻUKOWSKA, Dominik RYBARCZYK, Roman REGULSKI, Remigiusz LABUDZKI
Version	1.1

www.project-emerald.eu

Open-access book is about to be published soon

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Quick overview of the Intellectual outputs related to the EMERALD project

I02 - EMERALD e-toolkit manual for digital learning in producing biomimetic mechatronic systems

Start Date : 01 Aug 2022 End Date : 31 Jan 2023

Responsible: University of Agder

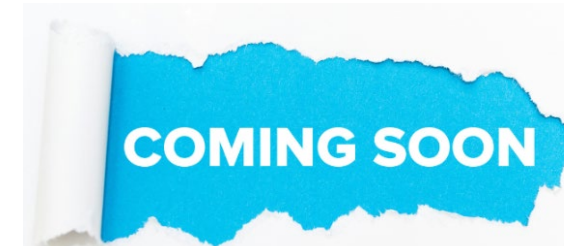
The aims of the I02 : > to provide e-toolkit for teaching purposes
> to provide the basics knowledge about the realizing of biomimetic mechatronic systems by 3D printing.
> to provide the other preliminary and post processing steps that are required to be followed in terms of CAD modeling
> diploma project themes

		RESPONSIBLES
Open access on the platform?	Conceiving the concepts of biomimetic mechatronic systems / bio-mechatronic domain	UiA
	Providing details related to the designing solutions used for conceiving the biomimetic mechatronic systems	PUT & TUCN
	Validation of the biomimetic mechatronic systems (solutions designed by CAD systems based on CAE analyses)	TUCN
Content?	Solutions related to the materials to be used for the realizing of the new developed biomimetic mechatronic systems	UPB
	3D printing and rapid tooling methods for the components to be realized for the new biomimetic mechatronic	TUCN & UPB & PUT
Template?	Description of assembling and programming of the systems	UiA
Report?	Aspects related to the set-up/functionality of the presented solutions/repeatability of the process /troubleshoot and control; inputs regarding the methods of testing of these new biomimetic mechatronic systems by AR / VR - solutions of conceiving, realizing and materializing of different scenarios in AR/VR where the biomimetic mechatronic systems will be connected and used for therapeutically purposes by the persons with special needs	BIZZCOM

Starting:
01.08.2022

Deadline:
31.01.2023

For each module according to the skills and competences of the EMERALD partners consortium, from the Technical team there will be nominated 1-2 responsible persons which will be in charge with the module and will need to provide the module for the e-toolkit manual.



31st of January 2022

www.project-emerald.eu

Quick overview of the Intellectual outputs related to the EMERALD project

I03 - EMERALD e-learning VR / AR platform for programming and using biomimetic mechatronic systems

Start Date : 01 Feb 2023 End Date : 31 Jul 2023

Responsible: BIZZCOM company

- The aims of the I03 : > the realization of a Virtual laboratory (e-learning) platform, that integrates VR / AR applications which can be accessed by professors and students
- > Programming and realizing of different scenarios in VR / AR / Mixed Reality, conceiving of different applications that can be connected with AR / VR (applications that can be downloaded at home)
 - > Applications developed by professors and students will be uploaded on the EMERALD platform

Open access on the platform?

	RESPONSIBLES
Designing of different scenarios, the programming of the biomimetic mechatronic systems	BIZZCOM Company
Preparing the e-library of the developed e-learning platform & aspects that are required to be followed by professors & students Hints & tips about regulations in modeling, selecting of the adequate materials, manufacturing solutions & assembling of such biomimetic mechatronic systems	TUCN & PUT & UPB
The project themes that are required for people with special needs & particularities of these types of topics	UiA / all partners
Logistics in terms of materials selecting, CAD, CAE, manufacturing & assembling of the new developed systems	TUCN & PUT & UPB
Potential stakeholders that are interested by the solutions developed by the EMERALD consortium	BIZZCOM
Feedbacks and recommendations	BIZZCOM/ all partners

Content?

Report?

Starting:
01.02.2023

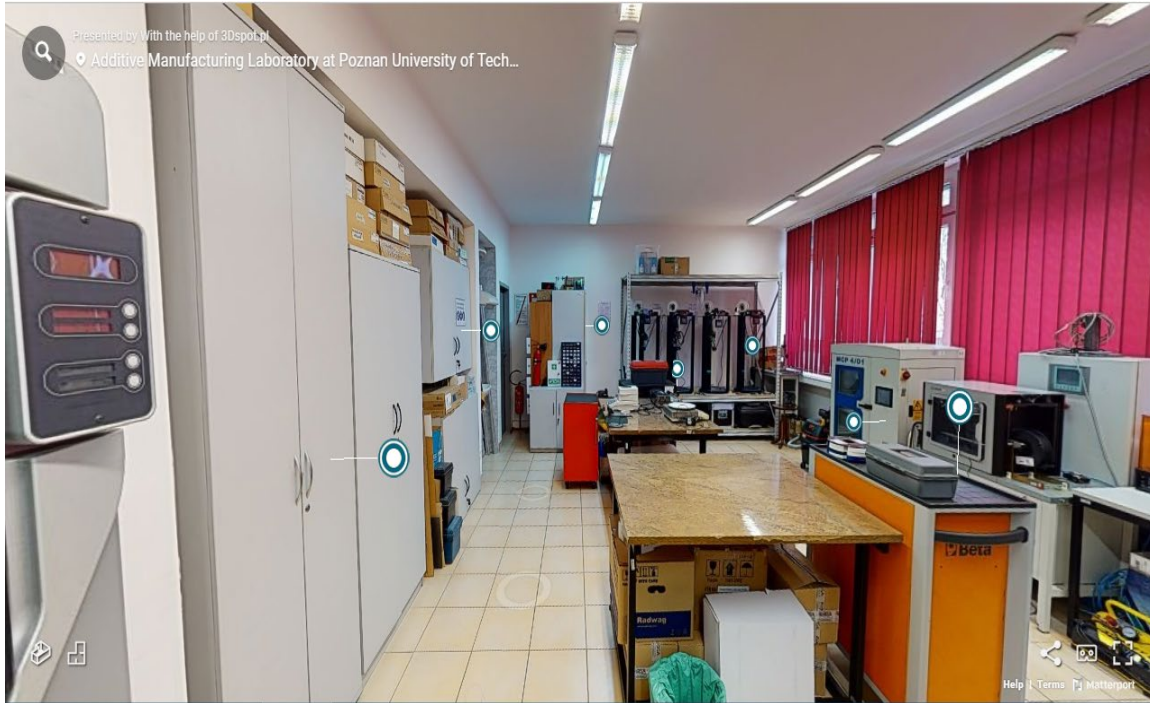
Deadline:
31.07.2023

For each room according to the skills and competences of the EMERALD partners consortium, from the Technical team there will be nominated 1-2 responsible persons which will be in charge with the virtual room and will need to provide the informations for the virtual room of the virtual laboratory.



European Network For 3D Printing Of Biomimetic Mechatronic Systems

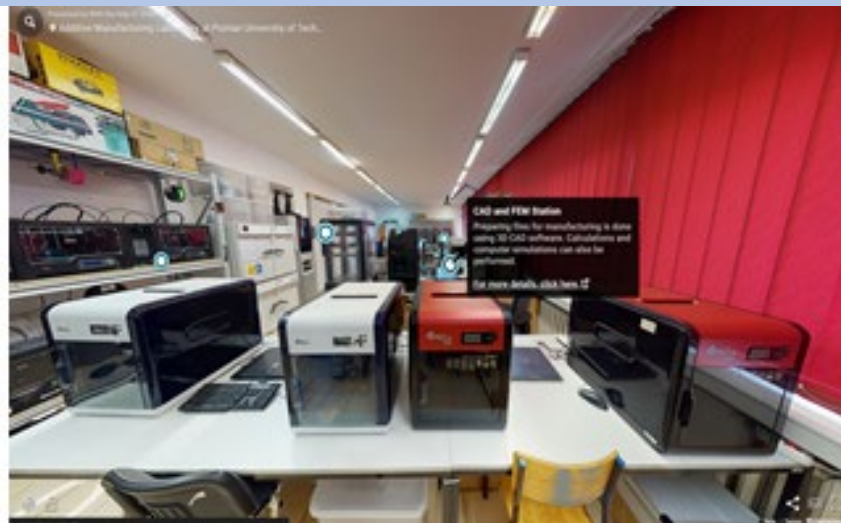
Quick overview of the Intellectual outputs related to the EMERALD project



Virtual platform laboratory (360 photos of the institutions involved in the EMERALD project)

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Quick overview of the Intellectual outputs related to the EMERALD project



Virtual platform laboratory (with elements of VR/AR integrated and considered also in the platform)

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Quick overview of the Intellectual outputs related to the EMERALD project

I04 - EMERALD e-case studies for project based learning method used in developing, testing and manufacturing of new biomimetic mechatronic systems by 3D printing technologies
 Start Date : 15 Feb 2022 End Date : 29 Sep 2023
 Responsible: Poznan University of Technology

The main aim of the I04 : ➤ the implementation of the communication and dissemination strategy for increasing awareness, understanding and engagement with users and target groups
 ➤ **4 CASE STUDIES** of biomimetic mechatronic systems made by 3D printing for people with special needs.

Open access on the platform?

Content?

Template?

Report?

	RESPONSIBLES
Designating of one person from each technical team of the EMERALD consortium as MENTOR for the students which will work on these topics.	UiA & TUCN & UPB& PUT
Selection of the 4 case studies	PUT / all partners
3 different TEAMS comprising 5-7 students from different countries of the consortium will start to work on the topic, starting from the CAD & CAE methods	all partners
Validation of the solutions proposed by the students	all partners
Selection of the material and 3D printing process by the students	UPB & TUCN & PUT
Programming tests & procedures	UiA & BIZZCOM
Final feedback	UiA

Starting:
15.02.2022

Deadline:
29.09.2023

For each case study according to the skills and competences of the EMERALD partners consortium, from the Technical team there will be nominated 1-2 responsible persons. 3 different teams comprising 5-7 students from different countries of the consortium will start to work on the topic. Validation of the solutions proposed by the students will be made with the help of their mentor (responsible professor of the EMERALD consortium) .

**WORK IN
PROGRESS**

**WORK IN
PROGRESS**

Main KPIs of the EMERALD project

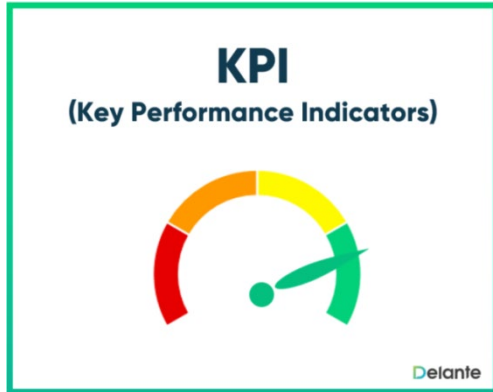
104 - EMERALD e-case studies for project based learning method used in developing, testing and manufacturing of new biomimetic mechatronic systems by 3D printing technologies

RESULTS (KPIs):

- ✓ 4 case study reports
- ✓ 1 open access book
- ✓ 1 open access toolkit manual
- ✓ 4 academic / scientific papers (ISI with Impact factor) are expected to be delivered at the end and shared via a-platform of EMERALD project as good practice use for dissemination
- ✓ e-learning platform conceived by the EMERALD consortium is intended to be used finally as one powerful tool for attracting the major stakeholders in the field of bio-mechatronics /3D printing domains) to scale up the solutions to build one active and representative network for 3D printing of biomimetic mechatronic systems in Europe (EMERALD network)

DISSEMINATION:

1. **Chapters that might be used by students for BSc projects / reports** that emphasize the case studies and use of EMERALD resources in developing, producing or testing new types of biomimetic mechatronic systems by 3D printing (reports will be shared via the e-learning platform of EMERALD project in open-access mode in order to emphasize how EMERALD resources were used in sorting out real issues in close correlation with the persons with special needs I adapted for these case studies);
2. **Case studies developed, tested and made at this level** will provide important feedbacks regarding the EMERALD resources and regarding the new biomimetic mechatronic systems developed for people with special needs.
3. Since topic of the EMERALD project and content is in the interest of SMEs and Medical Institutions, **transfer of know-how from the universities engaged in the EMERALD consortium to stakeholders**, as well as building strategic partnerships and **applying for new EU projects** is highly foreseen to be reached at dissemination level in the future as well.
4. **patenting process of the solutions developed by the EMERALD consortium** (patent submitting application)
5. **Advertising is not for dissemination**, but is needed for promoting of the consortium and events (logo of the project, advertising, web page, newspapers) etc.



Disseminating plan /conceived for the EMERALD project

DISSEMINATION PLAN




EMERALD
The Education, Scholarships, Apprenticeship and Youth Entrepreneurship
EUROPEAN NETWORK FOR 3D PRINTING OF BIOMIMETIC MECHATRONIC SYSTEMS
MODULE *number*
Name of Module

Project Title	European network for 3D printing of biomimetic mechatronic systems 714704819
Output	EM - EMERALD eBook for developing of biomimetic mechatronic systems
Module	Module "number" *Name of Module*
Date of Delivery	July 2022
Authors	
Version	FINAL VARIANT, *date*




Article
Mechanical and Wetting Properties of Ta₂O₅ and ZnO Coatings on Alloy Substrate of Cardiovascular Stents Manufactured by Casting and DMLS

Diana-Irinel Băilă ^{1,*}, Răzvan Păcurar ^{2,*}, Tom Savu ¹, Cătălin Zaharia ³, Roxana Truşcă ⁴, Ovidiu Nemes ⁵, Filip Gónski ⁶, Ancuţa Păcurar ², Alin Pleşa ⁷ and Emilia Sabău ²

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 - ⁵ Department of Environmental Engineering and Sustainable Development Entrepreneurship, Faculty of Materials and Environmental Engineering, Technical University of Cluj-Napoca, Bv. Muncii, No. 103-105, 400641 Cluj-Napoca, Romania
 - ⁶ Faculty of Mechanical Engineering, Poznan University of Technology, 60-965 Poznan, Poland
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- * Correspondence: baila_d@yahoo.com (D-I.B.); razvan.pacurar@sem.utcluj.ro (R.P.)



Publishing of EMERALD books and ISI articles



Disseminating plan /actions / involving stakeholders that are interested for the EMERALD project

DISSEMINATION PLAN



Manufacturing 2022
ISI conference



Springer Publishing House



Participating and publishing articles at important scientific conferences and other important events

Disseminating plan /conceived for the EMERALD project

The Eurasia Proceedings of
Science, Technology,
Engineering & Mathematics

EPSTEM

VOLUME 18 ICBASET CONFERENCE
ISSN: 2602-3199
ISBN: 978-605-73797-9-5

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Publishing

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ISSN: 2602-3199

The Eurasia Proceedings of Science, Technology, Engineering & Mathematics (EPSTEM), 2022
Volume 18, Pages 55-63

ICBASET 2022: International Conference on Basic Sciences, Engineering and Technology

**Moisture Absorption Behavior of CP5 Composite
Materials Used in Industry**

BABA DIANA-IRINEL
University Politehnica of Bucharest

PĂCĂRĂR RĂZVAN
Technical University of Cluj-Napoca

PĂCĂRĂR ANCUȚA
Technical University of Cluj-Napoca

Abstract. In engineering practice, perhaps the most interesting aspect of woodworking deals with the relationship between wood and moisture. The plywood composite presents hygroscopicity characteristic, as the wood and reaction almost like a sponge, will gain or lose moisture from the air based upon the conditions of the surrounding environment. When the tree is in the green state, is first felled, it contains a very large amount of moisture existing in two different forms: as free water that is contained as liquid in the pores or vessels of the wood itself and as bound water, trapped within the cell walls. After that the wood is exposed to the air and immediately loose free water and the wood does not contract or otherwise change in dimension, it is in the state of drying and it is called the fiber saturation point. The moisture content in each piece of CP5 composite material is expressed as a percentage of the weight of the water and oven-dry weight of CP5 composite material. The moisture absorption depends on the wood type, density of wood and it is influenced by the environmental temperature, this is an aspect very important in the furniture industry. The moisture absorption test is generally used for quality control purposes and to measure the degradation of the quality for the wood and composite materials.

DISSEMINATION PLAN



Papers presented and published at International Scientific
Conferences – SGEM 2022 & EPSTEM 2022

Disseminating plan /conceived for the EMERALD project



DISSEMINATION PLAN



Special Issue "Smart Materials, Intelligent Structures and Innovative Applications of 3D Printing and Bio-Printing Methods"

- Special Issue Editors
- Special Issue Information
- Keywords
- Published Papers

A special issue of *Materials* (ISSN 1996-1944). This special issue belongs to the section "Manufacturing Processes and Systems".



Special Issue Editors

Dr. Razvan Ioan Pacurar E-Mail Website SciProfiles
Guest Editor

Department of Manufacturing Engineering, Faculty of Industrial Engineering, Robotics and Production Management, Technical University of Cluj-Napoca, 400114 Cluj-Napoca, Romania
Interests: additive manufacturing; 3D printing; bio-printing; rapid tooling; hybrid manufacturing; topological optimization; computer aided design; computer aided engineering



Dr. Filip Górski E-Mail Website SciProfiles
Guest Editor

Faculty of Mechanical Engineering and Management, Poznan University of Technology, 60-965 Poznań, Poland
Interests: CAD/CAM/CAE systems; reverse engineering; 3D printing; virtual reality
Special Issues, Collections and Topics in MDPI journals



TUCN (Razvan Pacurar) / UPT (Filip Gorski) -Guest editors to MDPI Materials ISI journal – Q1 – ISI journal with IF 3.748

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3. Main actions of the EMERALD project. Summarizing of the planned actions

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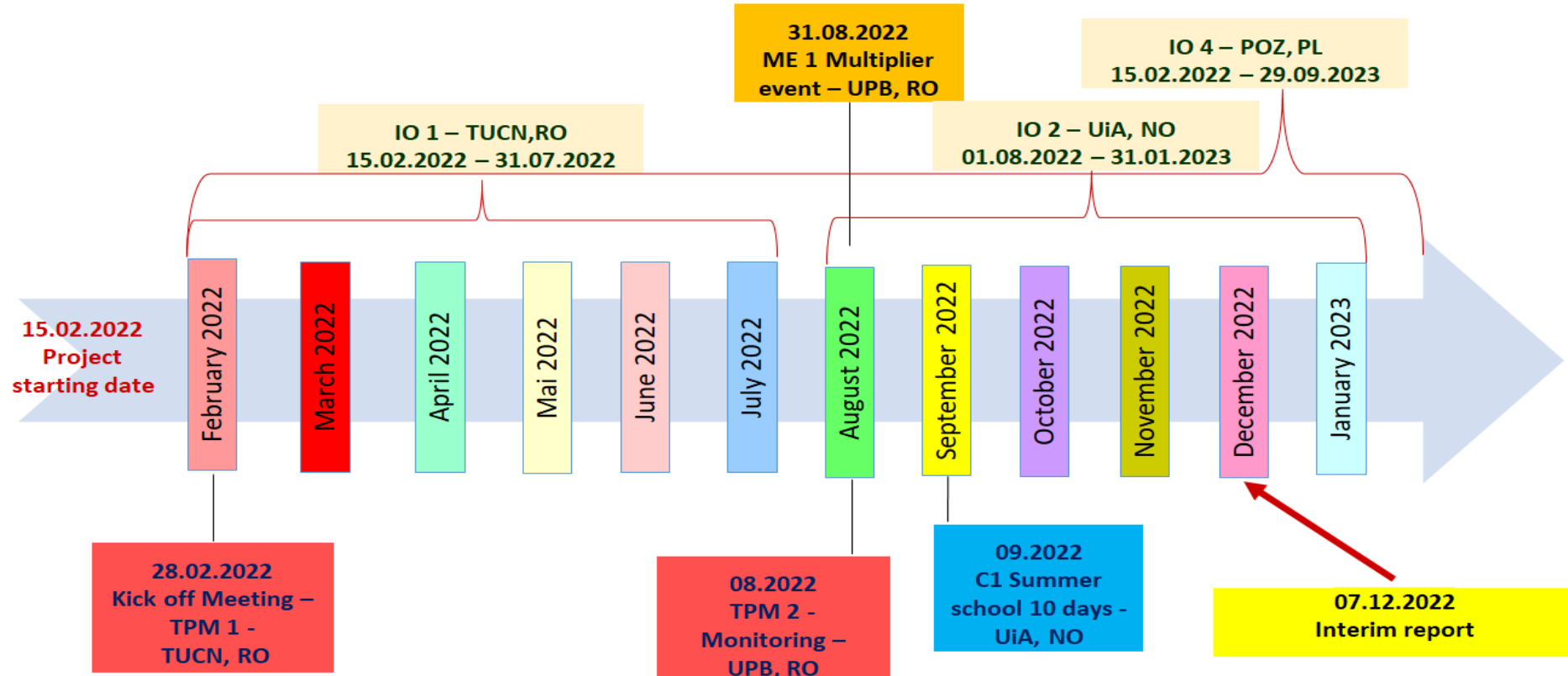
Main actions of the EMERALD project

EMERALD - Calendar of the project / deadlines / milestones

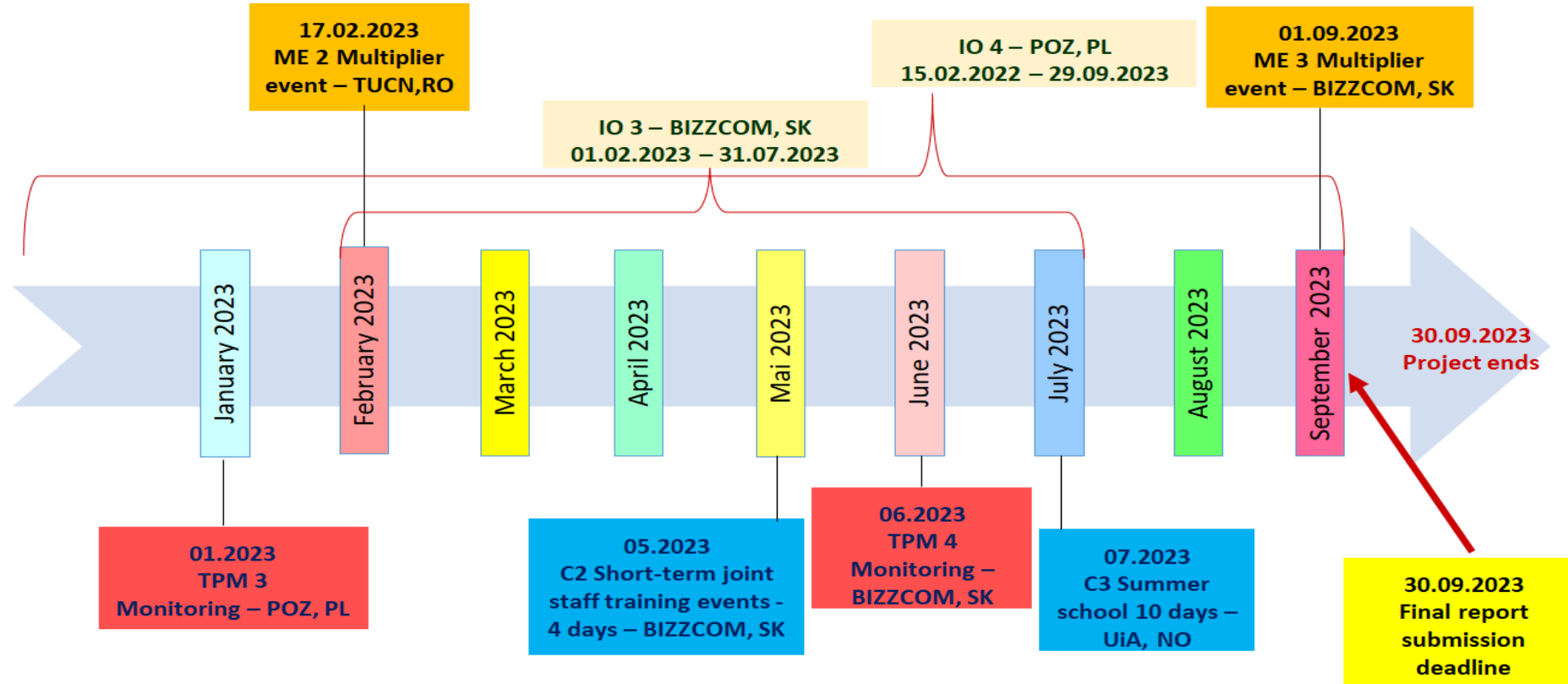
TPM	Transnational project meetings
ME	Multiplier Events
C	Intensive Programmes for higher education / Short-term joint staff training events

European Network For 3D Printing Of Biomimetic Mechatronic Systems

EMERALD - Calendar of the project / milestones – February 2022 – January 2023



EMERALD - Calendar of the project / milestones – February – September 2023



Main actions of the EMERALD project

EMERALD - Calendar of the project / deadlines / milestones

TPM	Transnational project meetings
ME	Multiplier Events
C	Intensive Programmes for higher education / Short-term joint staff training events

European Network For 3D Printing Of Biomimetic Mechatronic Systems

EMERALD – Kick off meeting – 28.02.2022 – TUCN, RO



European Network For 3D Printing Of Biomimetic Mechatronic Systems

EMERALD – Transnational Project Meeting – 30-31.08.2022 – University Politehnica Bucharest, RO



European Network For 3D Printing Of Biomimetic Mechatronic Systems

EMERALD – Transnational Project Meeting – 30-31.01.2023 – Poznan University of Technology, Poland



EMERALD – Monitoring Transnational Meeting - TPM 4 - July 2023 - BIZZCOM company, SK

The event will be organized at the **BIZZCOM company (SK)** together with the Executive team (1 representative of each institution that is involved in the consortium) + 1 representative of the Technical Team, with **the main goals:**

- ▶ to discuss about the finalizing of virtual laboratory platform that is expected to be finalized at the end of July 2023 within IO3
- ▶ to discuss about the case study reports that have to be finished until September 2023
- ▶ to monitor and discuss the status of open access book / toolkit manual / patent submission / diploma projects / academic papers that are expected to be made with the support of the medical institutions and mentors / co-mentors of the EMERALD consortium.
- ▶ aspects related to final scientific / dissemination / financial report will be discussed prior to this meeting as well, so as all planning about final delivery reports will be made in due time prior in advance (1 and half months before) for preliminary checking

Main actions of the EMERALD project

EMERALD - Calendar of the project / deadlines / milestones

	EMERALD - Calendar of the project / deadlines / milestones
TPM	Transnational project meetings
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Multiplier events organized within the EMERALD project in 2022-2023

	ORGANIZING INSTITUTION	DATE	LOCAL PARTICIPANTS	FOREIGN PARTICIPANTS
ME 1	University Politehnica Bucharest, Romania	2 SEPTEMBER 2022	40	-
ME 2	Technical University of Cluj-Napoca, Romania	17 FEBRUARY 2023	40	8
ME 3	BIZZCOM company ,Slovakia	11 SEPTEMBER 2023	40	-



EMERALD Multiplier Event on:

Research base learning method for teaching in bio-mechatronics



www.project-emerald.eu

Registration until 30th of August 2022

Organized by the Politehnica University of Bucharest, Romania
in cooperation with the EMERALD project consortium partners



EMERALD: European network for 3D printing of biomimetic mechatronic systems
EEA & Norway Grant - Contract No. 21-COP-0019

MULTIPLIER EVENT ON RESEARCH BASE LEARNING METHOD FOR TEACHING IN BIO-MECHATRONICS

POLITEHNICA University of Bucharest, Romania

Program

Date: 02.09.2022, between 9.00-14.00, UPB Central Library, Hall 2.2

Hour	Activity
9:00	Participants registration
9:15	Event opening Prof. Nicolae Ionescu (Politehnica University of Bucharest) / Prof. Tom Savu (Politehnica University of Bucharest) – Dep TCM
9:30	EMERALD Project Presentation Assoc. Prof. Diana Băilă (Politehnica University of Bucharest)
9:45	ANPCDEFP – Radu Stoika – EEA Norway grants – aims, particularities and opportunities
10:00	EMERALD Project – Main Aims, Actions and Activities of the project Assoc. Prof. Răzvan Păcurar (Technical University of Cluj-Napoca, Romania)
10:15	University of Agder Norway – Presentation Prof. Filippo Sanfilippo
10:30	Poznan University of Technology – Presentation Prof. Filip Gorski
10:45	LEYCOM Company – Presentation (Additive manufacturing of prostheses: SLM, SLA, SLS, FRESH 3D Printing, etc)

Multiplier event – UPB – 02 September 2022

11:00	Coffee Break
11:15	Intelligent (Smart) Materials Prof. Zaharia Cătălin (Politehnica University of Bucharest)
11:45	ADMASY'S Company – Presentation NUTECHNOLOGIES Company – Presentation
12:15	BIZZCOM Company - Slovakia Director Eng. Branislav Rabara
12:30	« Ilie Murgulescu » Institute of Physical – Chemistry – Romanian Academy - Bucharest Oxide nanomaterials used for sensors CS3 Eng. Oana Cătălina Mocioiu
13:00	Round table discussions about future potential collaboration in the bio-mechatronics / 3D printing domain - Assoc. Prof. Diana Băilă (Politehnica University of Bucharest)
13:30	Final conclusions
14:00	Lunch time

EMERALD project consortium partners:



Multiplier event – University Politehnica Bucharest – 02 September 2022



Multiplier event – University Politehnica of Bucharest, Romania – 2nd of September 2022



EMERALD Multiplier Event – UPB – plenary presentations

Multiplier event – University Politehnica Bucharest – 02 September 2022



EMERALD Multiplier Event - visiting the Bio-technology laboratory - Department of Bioresources and Polymer Science of UPB

Multiplier event – University Politehnica Bucharest – 02 September 2022



EMERALD Multiplier Event – 3D printing live demonstrations made by the companies / 3D printed parts for the EMERALD consortium partners' realized by the companies



EMERALD project - European Network for 3D printing of Biomimetic Mechatronic Systems

EMERALD Multiplier Event on:

Applied Research Teaching Methods for 3D printing in bio-mechatronics

17 February 2023

WHO can apply

Students (BSc / MSc / PhD)
Professors / Researchers
Companies / R&D Institutes

SPECIALIZATIONS:

- Manufacturing Engineering
- Bio-Mechatronics & Robotics
- Mechanical & Bio-Mechanical Engineering
- Computer Science & Automatics
- Science of Materials

More details
www.project-emerald.eu

Organized by the Technical University of Cluj-Napoca, Romania in cooperation with the EMERALD project consortium partners



EMERALD: European network for 3D printing of biomimetic mechatronic systems
EEA & Norway Grant - Contract No. 21-COP-0019

MULTIPLIER EVENT on Applied Research Teaching Methods for 3D printing in Bio-Mechatronics
(organized by the Technical University of Cluj-Napoca, Romania) -
b-dul Muncii 103-105, Cluj-Napoca - room: Aula Centenar
- Event agenda-
17th of February 2023

Session 1 - Higher Education institutions session	
8:30	Registration of participants to the Multiplier Event
9:00	Opening and Welcome ceremony: Rector prof. dr.eng. Vasile Topa (Technical University of Cluj-Napoca, Romania) Vice rector prof. dr.eng. Dan Măndru (Technical University of Cluj-Napoca, Romania) Dean - Faculty of Industrial Engineering, Robotics & Production Engineering - Prof. Corina Birleanu Head of manufacturing Engineering Department, Associate Prof. Adrian Trif City Hall Institution of Cluj-Napoca, Romania
9:20	25 years of success in the field of Additive Manufacturing for Medical Applications in Romania - prof. dr.eng. Nicolae Bălc and prof. dr.eng. Petru Berce (Technical University of Cluj-Napoca, Romania)
9:30	EMERALD project overall presentation - progress, actions, KPIs, perspectives / details about the event - Associate Prof. Răzvan Păcurar (Technical University of Cluj-Napoca, Romania)
9:40	EMERALD- Applied Research Teaching Methods for 3D printing in Bio-Mechatronics -e-toolkits for supporting people with amputated arms (Prof. Filippo Sanfilippo - University of Agder (Norway) - recorded presentation)
9:45	EMERALD- Applied Research Teaching Methods for 3D printing in Bio-Mechatronics -e-toolkits for supporting people with amputated arms (Prof. Filip Gorski - Poznan University of Technology (Poland))
10:00	EMERALD- Applied Research Teaching Methods for 3D printing in Bio-Mechatronics - e-toolkits for supporting people with amputated arms (Associate Prof. Diana Băla - Politehnica University of Bucharest (Romania))
10:10	EMERALD- Applied Research Teaching Methods for 3D printing in Bio-Mechatronics - e-toolkits for supporting people with amputated arms (Branislav Rabara - BIZZCOM Slovakia)
10:20	Eu+ and ERASMUS institutional projects - Ludmila Lutencu (International Relations Office - TUCN, Romania)
10:30	Norwegian grants project calls and opportunities - Ramona Demarcsek (coordinator - TUCN, Romania)
10:40	Coffee break
11:00	3D printing of medical products and bioprinting - Polytechnic University of Cartagena - Spain - Roca Joaquin - Academic Coordinator of the Biomedical Engineering Program at ETSII - Ojados González Dolores - LIDITEB technical coordinator - Ibarra Berrocal Isidro - Senior Administrative Officer (Head of Administration)



11:20	Artificial intelligence for creative engineering and robotics - Prof. Stelian Brad (TUCN, Romania), president of the Cluj IT cluster and coordinator of the European Digital Innovation Hub DIH4Society
11:35	Additive manufacturing support advances of Biomaterials - prof. Popa Cătălin - Dean of the Faculty of Materials and Environmental Engineering (TUCN, Romania)
11:45	Innovations in Medical Robotics - prof. Doina Prială - Head of Doctoral School (TUCN, Romania)
12:00	Coffee break
Session 2 - companies session - from evolution to revolution	
12:15	Vice rector Popescu Daniela - TUCN - opening the sessions organized with the companies
12:25	Admasys - (Markforged, Ultimaker, Formlabs, Minifactory, Evo-Tech, Artec, Shining - representatives in Romania) - company presentation
12:35	Nu Technologies (Stratays / Materialise / Slama - representatives in Romania) - company presentation
12:45	CAD Works (3D systems / HP / Markforged - representatives in Romania) - company presentation
12:55	Leykon (DWS Systems / Massivit / 3NTR / BCN3D / Ultimaker) - representatives in Romania) - company presentation
13:05	symme 3D (the biggest Romanian startup 3D printing company in Romania) - company presentation
13:15	DMG Mori Romania - company presentation
13:25	Pro4D Form (envisionTEC bioplotters / Desktop Metal - representatives in Romania) - company presentation
13:35	Lunch break / press conference
Session 3 - demo room / companies exhibition / TUCN laboratories visit	
14:30	Visiting of TUCN laboratories - Demo room / companies exhibition - main hall, B-dul Muncii - National Centre of Innovative Manufacturing - Robotics and Mechatronics laboratories - CESTER
Session 4 - new project calls / constituting of the EMERALD Network / clusters / R&D agencies	
15:30	Premises of constituting the new EMERALD network for 3D printing in mechatronics Răzvan Păcurar (Technical University of Cluj-Napoca, Romania)
15:35	HORIZON EUROPE open calls - prof. Ovidiu Nemeş (director - Research - TUCN, Romania)
15:50	North West Regional Development Agency, Romania - Lavinia Chiş, INNO Platform Department & Cristian Otaon (Intelligent specialization Department)
16:10	Bianca Muntean - Transylvania IT Cluster - opportunities related to "Health" domain - new project calls
16:30	Oana Buzatu + Mirela Botezan + Răzvan Chereches - CREIC + new project calls and perspectives (City Hall Institution of Cluj-Napoca)
16:40	Q&A with partners comments and discussions on the possibility of joining different projects / consortium / EU Networks
17:00	Closing words / ending of Multiplier Event



**Multiplier event -
TUCN - 17th of
February 2023**

European Network For 3D Printing Of Biomimetic Mechatronic Systems

Multiplier event – TUCN – 17 February 2022



Next Multiplier event – BIZZCOM – Bucany, Slovakia – 11th of September 2023

ME3 - EMERALD personalized and project learning methods for Higher education

Start Date : 01 Sep 2023

End Date : 01 Sep 2023

Country of Venue : BIZZCOM company ,Slovakia

Participating Organizations : University Politehnica Bucharest, Technical University of Cluj-Napoca, University of Agder, Bizzcom s.r.o., Poznan University of Technology

Event Description : to present and share the results reached in intellectual output 3, e-learning virtual laboratory (e-learning platform) & and intellectual output 4 related to e-case studies

Organized free of charge ! one day ! and the participants are required to register in the preamble. **Expected number of attendees is about 40 people.**

The target groups: ➤ are colleagues, teaching staff, students, other people involved in Higher education in their respective organizations
Intellectual Outputs Covered : IO3 and IO4

The aims of ME3 are:

- personalized and project learning methods can be used for teaching in higher education using the EMERALD virtual laboratory platform
- presenting and experiencing of the virtual laboratory / AR / mixing AR applications developed by EMERALD consortium
- conclusions, future perspectives of implementing and transferring of the results, publications, dissemination, new project proposals
- future activities/perspectives of EMERALD consortium in digital learning & teaching, implementing & transferring of the results

PROPOSED AGENDA

9:00 - Registration of the participants.	12:00 EMERALD project perspectives in implementing, disseminating and transferring of the results
9:30 - Welcome to the multiplier event at BIZZCOM company (Slovakia)	12:30 Round table, Q & A, final conclusions
10:00 Presenting on how personalized and project teaching methods can be used in teaching in higher education (using the EMERALD resources)	14:00 Live experiencing of the EMERALD VR/ AR e-learning platform
10:30 Overall presentation about e-virtual laboratory / e-learning platform developed by the EMERALD consortium	
11:30 Presenting of EMERALD consortium opportunities (case studies developed based on project base learning methods for people with special needs (practical using of EMERALD e-virtual laboratory / e-learning platform)	

Main actions of the EMERALD project

EMERALD - Calendar of the project / deadlines / milestones

	EMERALD - Calendar of the project / deadlines / milestones
TPM	Transnational project meetings
ME	Multiplier Events
C	Intensive Programmes for higher education / Short-term joint staff training events

LTT activities

Intensive Programmes for higher education / Short-term joint staff training events

	ORGANIZING INSTITUTION	PERIOD / NUMBER OF DAYS	SENDING ORGANISATION	STUDENTS	PROFESSORS	INVITED STAFF	
C 1	University of Agder, NO	SEPTEMBER 2022 / 10 DAYS	Technical University of Cluj-Napoca	5	4	-	UiA – 5 extra participants TOTAL : 30 participants
			University Politehnica Bucharest	5	2	-	
			University of Agder	-	-	-	
			Bizzcom s.r.o.	-	-	2	
			Poznan University of Technology	5	2	-	
C 2	Bizzcom s.r.o., SK	MAY 2023 / 4 DAYS	Technical University of Cluj-Napoca	-	4	-	Bizzcom s.r.o. – 4 extra participants TOTAL:20 participants
			University Politehnica Bucharest	-	4	-	
			University of Agder	-	4	-	
			Bizzcom s.r.o.	-	-	-	
			Poznan University of Technology	-	4	-	
C 3	University of Agder, NO	JULY 2023 / 10 DAYS	Technical University of Cluj-Napoca	5	4	-	UiA – 5 extra participants TOTAL : 30 participants
			University Politehnica Bucharest	5	2	-	
			University of Agder	-	-	-	
			Bizzcom s.r.o.	-	-	2	
			Poznan University of Technology	5	2	-	

European Network For 3D Printing Of Biomimetic Mechatronic Systems

LTT activities

C1 : Intensive Programmes for higher education students – 3D printing and bio-mechatronics

Duration : 10 day(s)

Country of Venue : Norway

Total number of Participants : 30

Date: September 2022

The 1st International summer school organized by the University of Agder.

Participating Organizations : University Politehnica Bucharest, Technical University of Cluj-Napoca, University of Agder, Bizzcom s.r.o., Poznan University of Technology

The target groups: ➤ professors (from EMERALD consortium and engaged in technical activities) & students
Organized free of charge! the participants are required to REGISTER in the preamble.

Aims: Starting from the curriculum that has been defined by the EMERALD project consortium and taking into consideration that at the time of organizing this event, e-support courses are being delivered, EMERALD consortium professors will be able to exercise the usefulness of the information provided in the e-courses on the 1st edition of EMERALD International summer school, by being engaged in teaching activities and sharing the information prepared in the e-course modules (e-book) IO1 with the attending professors & students.

Courses & practical activities related to the IO1 modules

Computer Aided Design,
Computer Aided Engineering,
Computer Programming,
Virtual Reality / Augmented Reality,
Sensors and Electronics,
BioMechatronics,
3D printing and Rapid Tooling methods,
Intelligent materials

Students will be organized in teams and competitions will be launched in order to finally produce the case studies that are being required to be made for the final test (case studies will be the ones stated to be realized in the O2, adapted for people with special needs). At the end of the EMERALD International summer school, all participants will receive an invitation of joining the future activities of EMERALD consortium activities together with their professors (mentors) in the next upcoming year.

Content?

Report?

Certificates ?



1st edition of the EMERALD International Summer School University of Agder (Grimstad, Norway)– 12-23 September 2022

EMERALD International Summer School on:

3D printing in bio-mechatronics



**12-23
SEPTEMBER
2022**

**WHO
can apply**

Bachelor students (BSc)
Master students (MSc)
PhD students

SPECIALIZATIONS:
Manufacturing Engineering
Bio-Mechatronics & Robotics
Mechanical & Bio-Mechanical Engineering
Computer Science & Automatics
Science of Materials

www.project-emerald.eu

Registration until 9th of September 2022

Organized at the University of Agder, Norway by the EMERALD project consortium partners



EMERALD International Summer School on 3D Printing in Bio-Mechatronics – 12-23 September 2022

h	Monday 12.09.2022	Tuesday 13.09.2022	Wednesday 14.09.2022	Thursday 15.09.2022	Friday 16.09.2022	Monday 19.09.2022	Tuesday 20.09.2022	Wednesday 21.09.2022	Thursday 22.09.2022	Friday 23.09.2022	h	
10	Opening ceremony and project presentation	CAD - Lecture	CAE - Lecture	Workshop 3D Printing and Progress report, feedbacks regarding printing process, corrections to be made	Company visit, professional visit of SME company in Kristiansand / Stavanger + visiting of the fjords / socializing activity	General progress of W1 and objectives of W2	Intelligent (smart) materials	Computer Programming case studies	Finalizing progress report, preparing final presentation	Closing and awarding ceremony, future perspectives of the EMERALD project	10	
11	Participants' presentation and program guidelines for summer school	Workshop 3D / Launching of case studies	Workshop 3D CAE & Progress report	Medical and mechanical tests, metrology of mechatronic systems		Feedback on behalf of the EMERALD experts and guidelines for W2	Sensors and electronics	VR and AR programming applications presentation, case studies	Final test, final questionnaires and feedbacks	EMERALD final consortium meeting	11	
12	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time		Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	Lunch & free time	12
13	Visiting of UiA laboratories and city tour of Kristiansand city	Workshop 3D CAD redesigned & Progress report	3D printing and Rapid Tooling for mechatronics	Laboratory on Mechanical test, metrology/ medical institute visit		Bio-mechatronics	Assembling and testing of mechatronic systems conceived and developed	Developing of VR/AR applications	Round table with local representatives of business sector (companies / research institutes) involved in mechatronics)	Free time, sightseeing	13	
14			Workshop 3D Printing and Progress report	Re-designing/ re-analyzing / re-3D printing of the components		Laboratory on / bio-mechatronics			Final student presentations			14
15											15	
WEEK 1						WEEK 2						

European Network For 3D Printing Of Biomimetic Mechatronic Systems

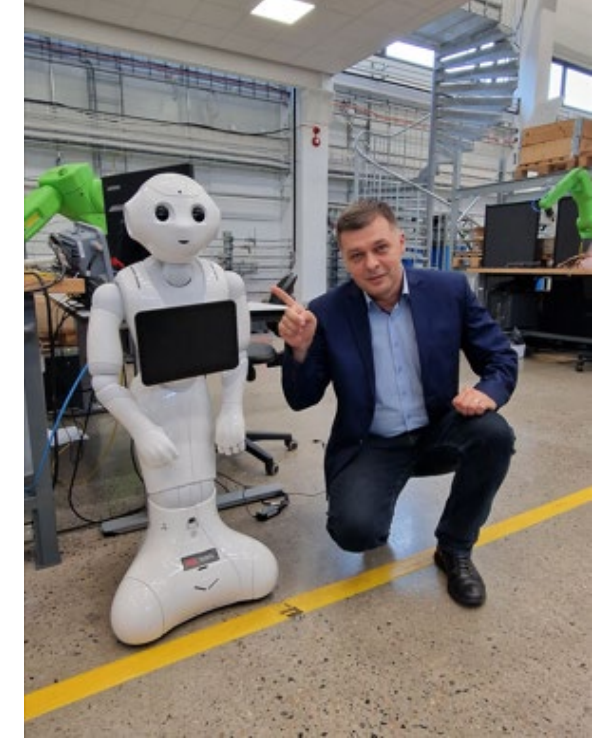
1st edition - EMERALD International Summer School - UiA (Norway) – 12-23 September 2022



EMERALD International summer school – unique of life experience

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Visiting of the MIL laboratory (University of Agder, Norway)

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Case 1: bicycle prosthesis

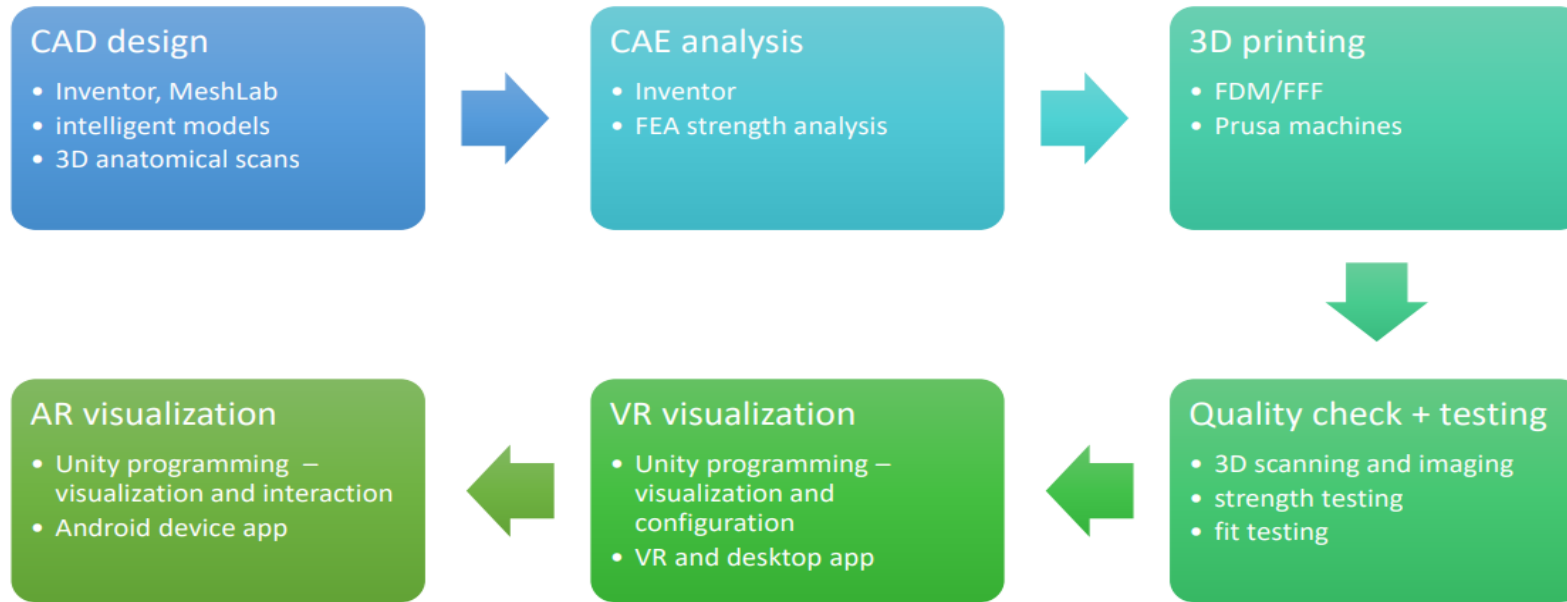


Case 2: hand orthosis

Launching of case studies by Prof. Filip Gorski, Poznan University of Technology, Poland

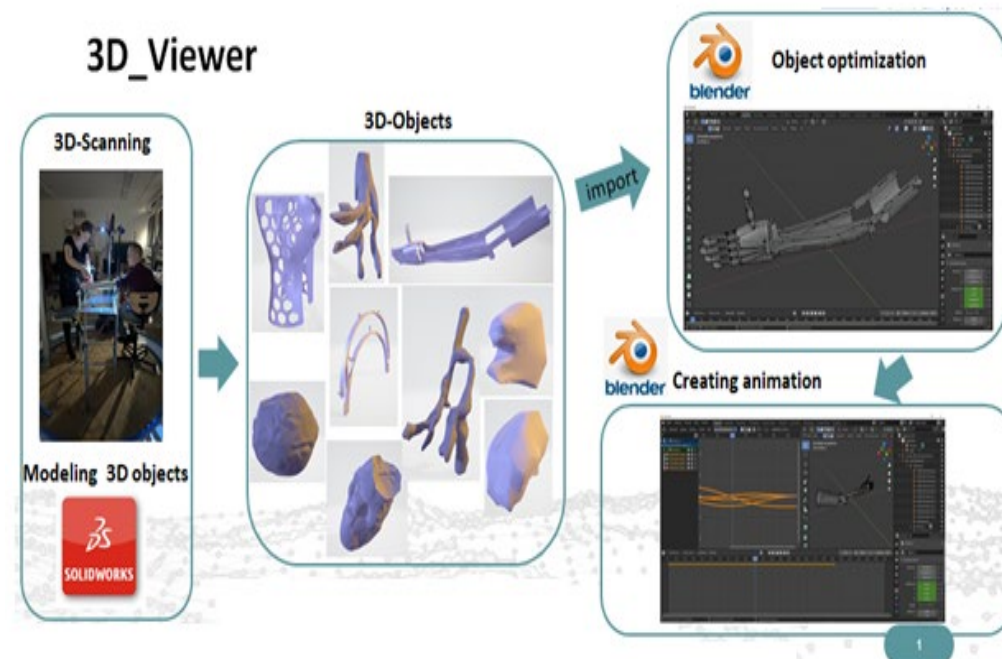
1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022

COURSE OF WORK WITH THE CASES



Launching of case studies and requirements

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



AR presentation held by Michal Gallia, programmer – BIZZCOM s.r.o, Slovakia

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



**Working on CAD / CAE / 3D printing topics for the case studies launched by Prof. Filip Gorski
constructive and nice interactions between students coming from different countries / universities**

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



**Working on the mechatronic system developed by the students at the University of Agder, Norway
constructive and nice interactions between professors and professors coming from different countries / universities**

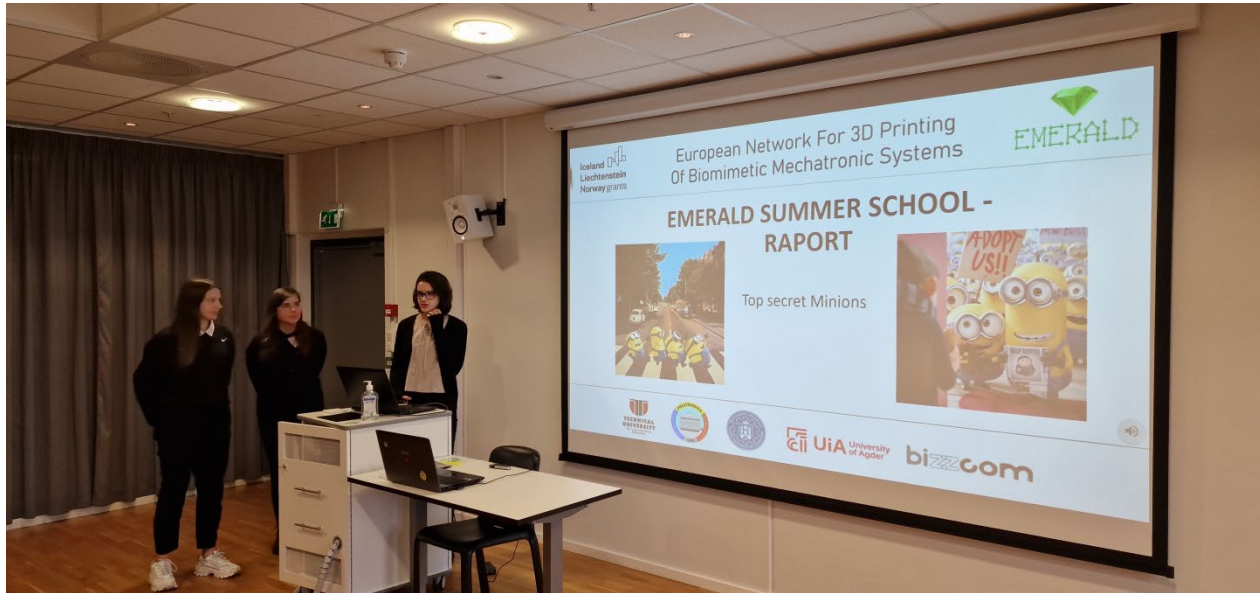
European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022




Final test defended by the EMERALD students

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Final presentations realized by the EMERALD students

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



*Feedback form for the Intensive programme
for higher education learners*

Name of the meeting:	EMERALD International Summer School 2022
Objectives of the meeting:	Summer School "3D printing in bio-mechatronics"
Organizer:	University of Agder (UiA), Norway
Dates of the meeting:	12-23 September 2022
Location of the meeting:	Grimstad, Agder - Norway

Instructions: Please indicate your level of agreement with the statements listed below, on a scale from 1 to 5, where:


1 - Strongly disagree 3 - Neutral 5 - Strongly agree
2 - Disagree 4 - Agree


A. Objectives of the meeting

Statement	Score				
	1	2	3	4	5
1. The objectives of the meeting were clearly defined.					
2. The objectives were met during the meeting.					
3. All the relevant topics were covered during the meeting.					
4. The content was well organized and easy to follow.					
5. I obtained useful information and knowledge that will help me throughout the project.					

B. Organization of the meeting

Statement	Score				
	1	2	3	4	5
6. The meeting was well organized.					
7. The facilitator was knowledgeable about the discussed topics.					
8. The facilitator was dedicated and supportive.					
9. Participation and interaction were encouraged.					
10. The schedule and the agenda were observed throughout the meeting.					
11. The materials distributed were useful.					
12. The time allocated for the meeting and for the activities, was sufficient.					
13. The meeting room and facilities were adequate and comfortable.					





CERTIFICATE OF ATTENDANCE

This is to certify that

Name and Surname


has attended the EMERALD International Summer School on:

3D Printing in Bio-Mechatronics
from 12.09.2022 to 23.09.2022


Organized at the University of Agder, Norway by the EMERALD Project consortium partners

Prof. Dr. Eng. Filippo Sanfilippo,
Partner of EMERALD project

In cooperation with



EMERALD International Summer School on:
3D Printing in Bio-Mechatronics
is organized at the University of Agder, Norway by the
EMERALD Project consortium partners



F-SEE-113/12.2018

The Education, Scholarships, Apprenticeships and Youth
Entrepreneurship Programme – EEA Grants 2014-2021
Project No:
21-COP-0019
Project Title:
European network for 3D printing of biomimetic mechatronic systems

Certificate of attendance Intensive Programme activities

I undersigned Prof. Sunniva Whittaker
position Rector
representing the host organisation: University of Agder (UiA)
address: Postboks 422 , 4604 Kristiansand, Norway
city: Kristiansand, country Norway

certify that the following persons:

	staff	student
Mr. Michal Gallia	X	<input type="checkbox"/>
Mr. Martin Zelenay	X	<input type="checkbox"/>

representing the sending organisation:

complete name: Bizzcom s.r.o.
address: Šľachitelská 591/2, 919 28 Bučany, Slovakia
city: Bučany, country Slovakia
were present from 12.09.2022 to 23.09.2022
attended a short term mobility organised in: Grimstad, Agder, Norway

Short term joint staff training events
 Blended mobility
 Intensive study programme

Place: Kristiansand date 23.09.2022
The host organisation: University of Agder (UiA)
(signature of the legal representative & stamp if applicable)

Feedback forms and certificates provided to the EMERALD International summer school participants

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Blatchford ortopedi Norway company presentation - case studies revealed by Physiotherapist & Department leader of Blatchford Arendal - Bjarne Lindebø

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Blatchford ortopedi Norway company presentation - case studies revealed by Physiotherapist– Bjarne Lindebø

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Open discussions between Blatchford ortopedi Norway company representatives and professors / students of the EMERALD International summer school in Norway

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Ending up of a very intense , but consistent period of the EMERALD International summer school in Norway (2022 edition)

European Network For 3D Printing Of Biomimetic Mechatronic Systems

1st edition - EMERALD International Summer School - UiA (Norway)– 12-23 September 2022



Ending of the first edition of the EMERALD International summer school

LTT activities

C2 : Short-term joint staff training events – 3D printing and bio-mechatronics

Duration : 4 day(s)

Country of Venue : Slovakia

Total number of Participants : 20

Bucany,
Slovakia

Date: May 2023

The International summer school organized by the BIZZCOM company

Participating Organizations : University Politehnica Bucharest, Technical University of Cluj-Napoca, University of Agder, Bizzcom s.r.o., Poznan University of Technology

Staff for
training
event

Activity : > is focused on the use and testing the functionality of e-virtual laboratory (e-learning) platform developed by the EMERALD consortium for teaching activities related to the manufacturing of biomimetic mechatronic systems by 3D printing

The target groups: > professors > other people / institutions (stakeholders) involved in research activities related to the developing, manufacturing and testing of new biomimetic mechatronic systems made by 3D printing, for people with special needs

VR EMERALD
platform

1-6 May 2023

Testing the functionality of virtual laboratory platform developed within IO3 related to: different scenarios in VR / AR / Mixed Reality applications for people with special needs

IMPORTANT FEEDBACKS

Content?

AR applications

Report?

Certificates ?

LTT activities

C2 : Short-term joint staff training events – 3D printing and bio-mechatronics



LTT activities

C3 : Intensive Programmes for higher education students - 3D printing and bio-mechatronics

Duration : 10 day(s)

Country of Venue : Norway

Total number of Participants : 30

Date: July 2023

The 2nd International summer school organized by the University of Agder.

Participating Organizations : University Politehnica Bucharest, Technical University of Cluj-Napoca, University of Agder, Bizzcom s.r.o., Poznan University of Technology

The target groups: ➤ professors (from EMERALD consortium and engaged in technical activities) & students
Organized free of charge ! the participants are required to REGISTER in the preamble.

Aims: to familiarize the attendees with the personalized and project based teaching methods used in Higher education and the efficiency of these methods in using the EMERALD project resources, especially e-virtual laboratory (e-learning platform) AR / VR / mixed reality applications for getting knowledge and practical skills in developing of new biomimetic mechatronic systems by 3D printing technologies and specific applications related to the programming of biomimetic mechatronic systems AR / VR applications.

Students will be able first to understand the basic principles that are related to CAD/CAE, manufacturing, programming and testing of biomimetic systems using e-virtual laboratory (e-learning) platform.

Professors will present on a course the basics of different case study that is being prepared, with the particularities involved in the case when biomimetic mechatronic systems are required to be materialized for people with special needs, emphasizing the facilities of the virtual laboratory (e-learning platform / AR / VR applications).

In this way the easiness in using the e-learning platform of the EMERALD consortium will be checked based on the feedbacks provided by students.

Testing and experiencing the virtual laboratory platform developed within IO3 related to:
different scenarios in VR / AR / Mixed Reality applications for people with special needs

IMPORTANT FEEDBACKS

Certificates ?

Report?

Main results reached during the EMERALD summer school organized at the University of Agder in July 2023 will be presented in September 2023 at the Multiplier event organized in Slovakia by BIZZCOM

LTT activities

C3 : Intensive Programmes for higher education students - 3D printing and bio-mechatronics



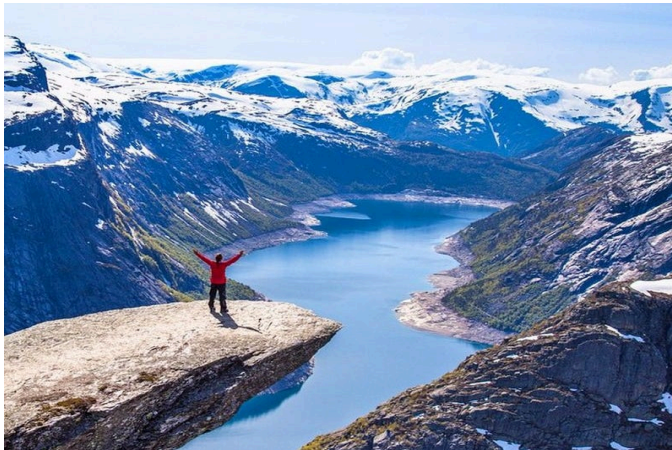
Experiencing of the Virtual platform laboratory conceived by the EMERALD consortium in bio-mechatronics / 3D printing (with AR /VR facilities)

European Network For 3D Printing Of Biomimetic Mechatronic Systems

EMERALD International Summer School – 2023 edition

Strong motivation for the 2nd EMERALD International Summer school – 2023 edition (September 2023)

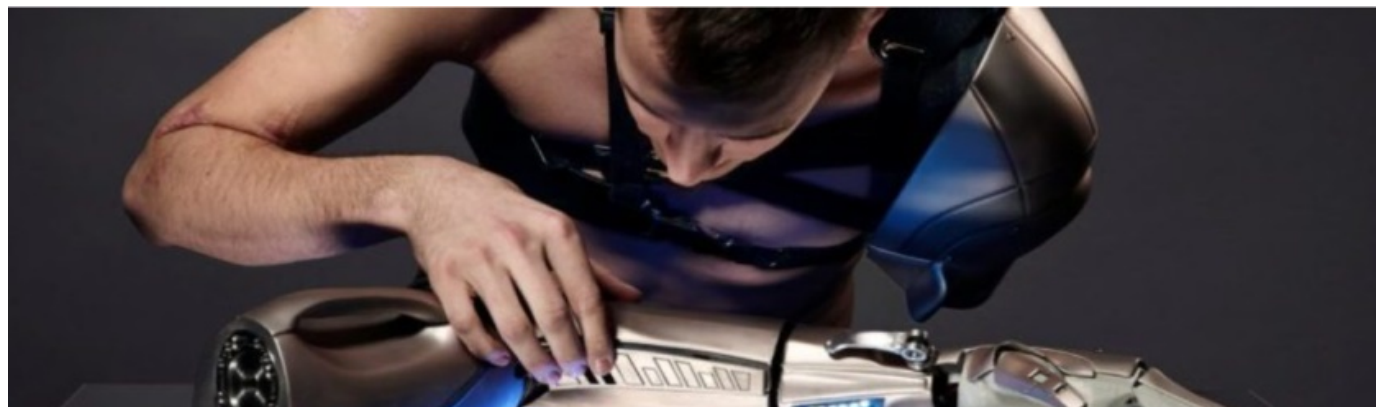
The 2nd EMERALD International Summer School will be organized in Grimstad (Norway) at the University of Agder (15th -24th of September 2023) in the field of 3D printing / VR/ AR / bio-mechatronics!!! = places are quite limited both for professors and students = please contact the EMERALD consortium partners for more details in the next period asap if you are interested to apply for =



European Network For 3D Printing Of Biomimetic Mechatronic Systems



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