



BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the
Erasmus+ Programme
of the European Union

Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period – BRIGHT

2020-1-RO01-KA226-HE-095517

Assoc. Prof.dr.eng. Razvan Pacurar

Department of Manufacturing Engineering,

Faculty of Industrial Engineering, Robotics & Production Management, TUCN, RO

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Erasmus+ KA 226 project for Higher Education =strategic partnership for Digital Education=

European Commission > Erasmus+ > Erasmus+ project results > Erasmus+ project card >

Erasmus+

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Coordinator
TU Cluj-Napoca (RO)



Partners from Higher Education institutions

Total Budget:
187.480 EUR

Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period

5 Participating countries:

[VIEW PROJECT MAP](#) [DOWNLOAD AS PDF](#)

Start: 01-03-2021 - End: 28-02-2023
Project Reference: 2020-1-RO01-KA226-HE-095517
EU Grant: 187480 EUR

Programme: Erasmus+
Key Action: Cooperation for Innovation and the exchange of good practices
Action Type: Partnerships for Digital Education Readiness

[Open and distance learning](#) [Health and wellbeing](#)
[New innovative curricula/educational methods/development of training courses](#)

Summary

Coordinator

UNIVERSITATEA TEHNICA CLUJ-NAPOCA
STR MEMORANDUMULUI 28
400114
CLUJ NAPOCA
<http://www.utcluj.ro>
Organisation type: Higher education institution (tertiary level)

Partners

- POLITECHNIKA POZNANSKA
- SLOVENSKA TECHNICKA UNIVERZITA V BRATISLAVE
- BIZZCOM s.r.o.
- SVEUCILISTE JURJA DOBRILE U PULI
- UNIVERZITET U NISU
- B. M. PLAST DRUŠTVO S OGRANIČENOM ODGOVORNOSTU ZA PROIZVODNJU PROIZVODA OD METALA I PLASTIKE



Univ of Nis (SRB)



Poznan Univ of Technology (PL)



STU Bratislava (SK)



Juraj Dobrila Univ (HR)

Total Duration:
2 years

Starting date:
31.03.2021

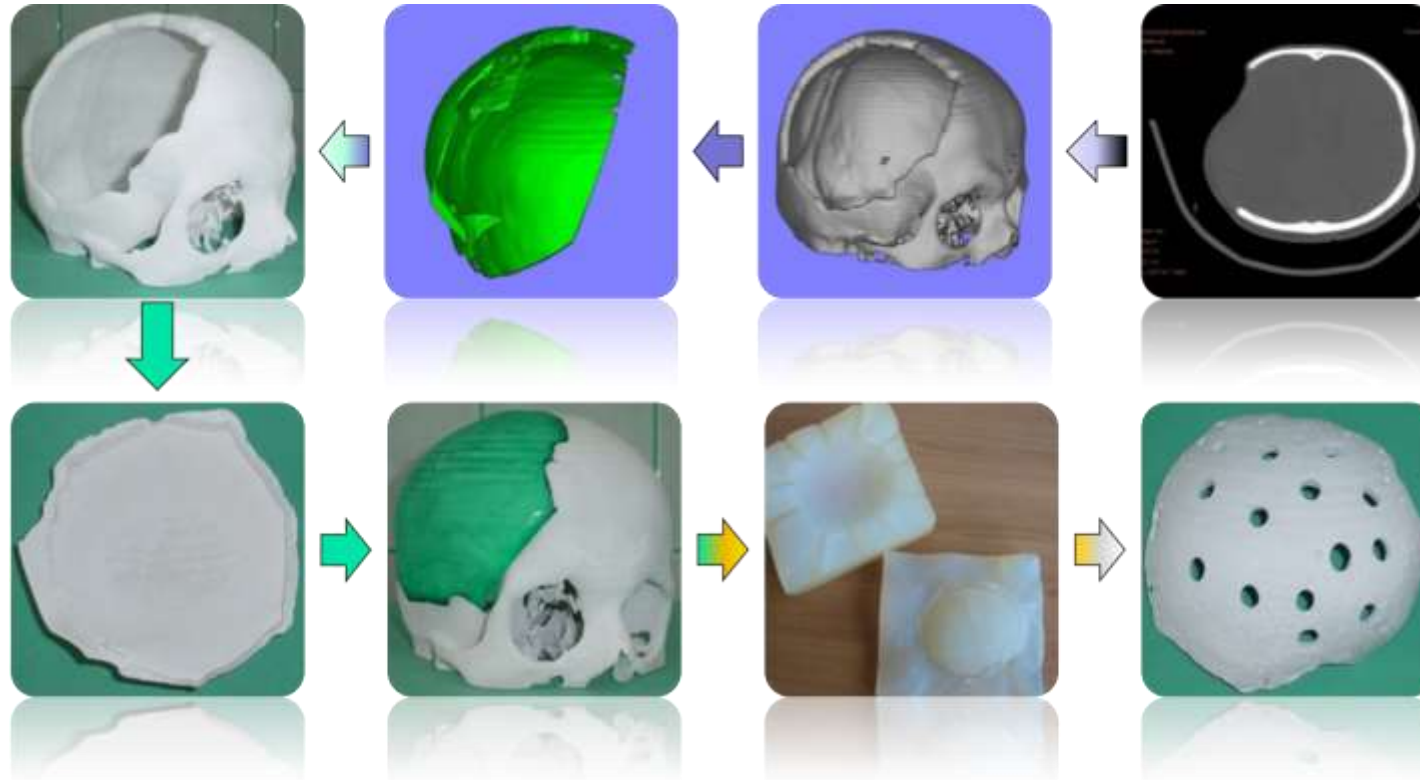
Ending date:
28.02.2023

bm plast (HR)

(SK)



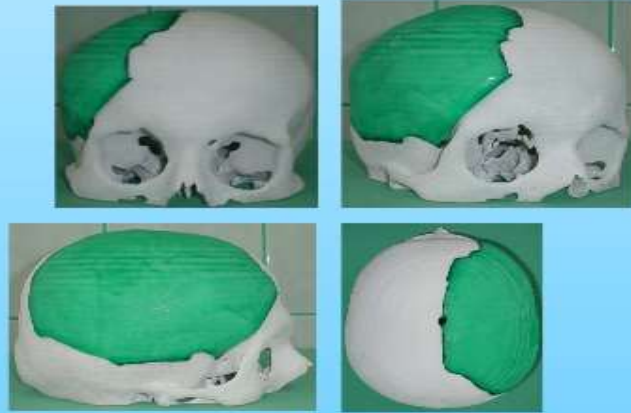
**First step in writing a success proposal
scientific background (strong elements) - previous experience
(research projects)**



Medical applications – National Research grant – CEEEX – 2005-2008 (Department of Manufacturing Engineering, TUCN)

First step in writing a success proposal scientific background (strong elements) - previous experience (research projects)

The master model, made at DME - TUCN



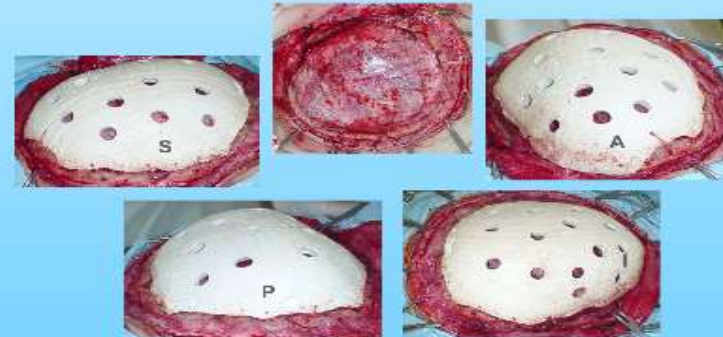
Vacuum casting of the silicone rubber
moulds, made at DME - TUCN



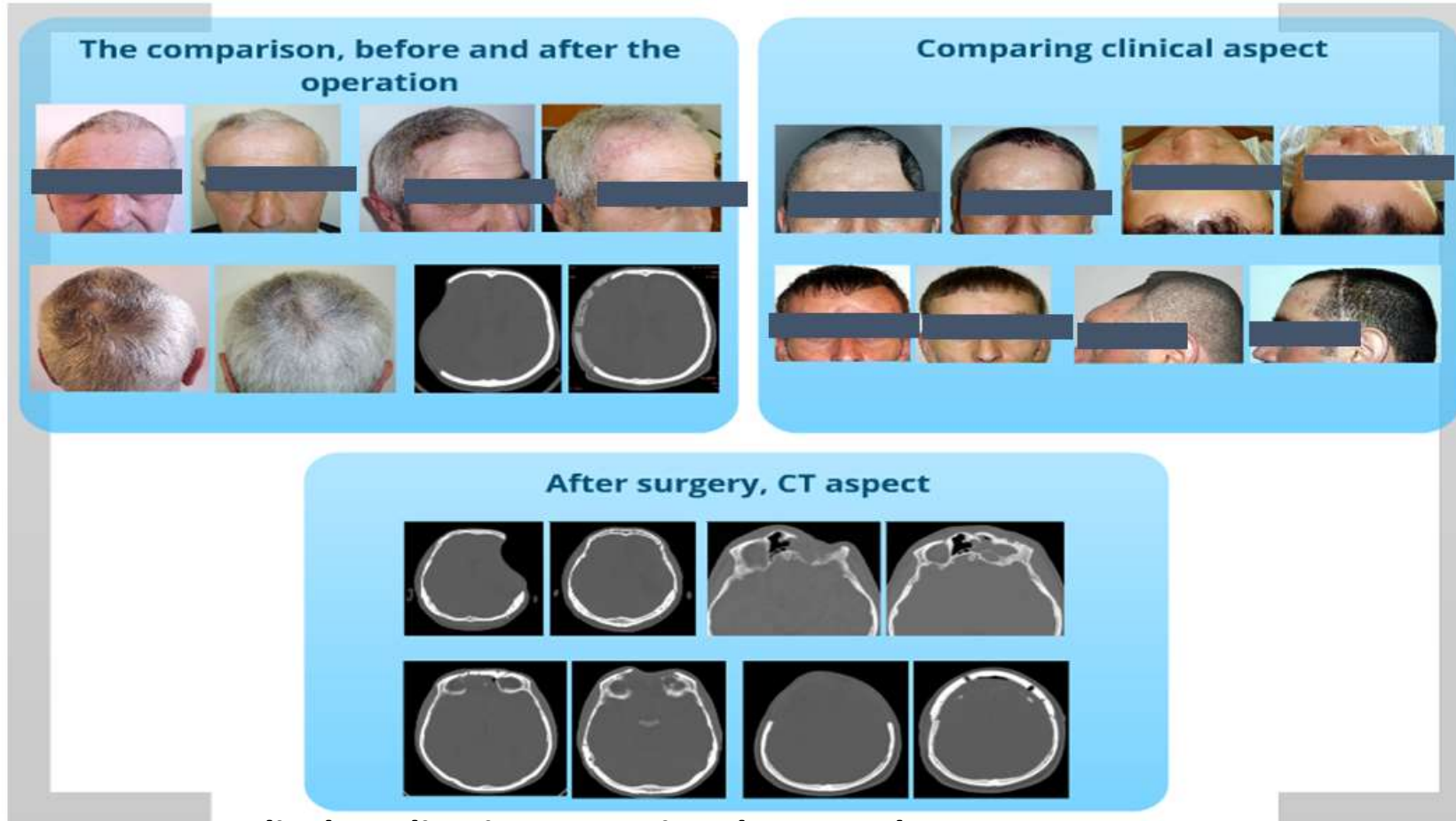
Finishing and milling the implant



Fixing the implant - surgical operation

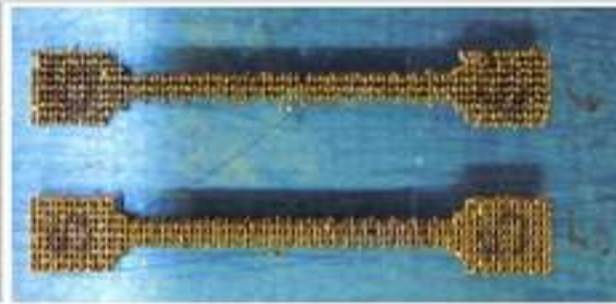
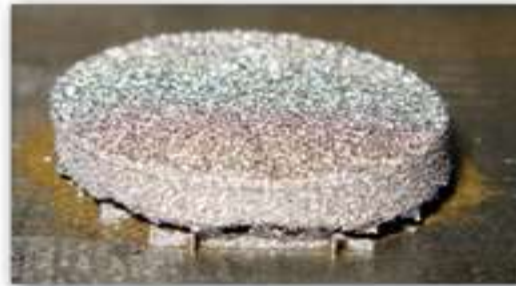


First step in writing a success proposal scientific background (strong elements) - previous experience (research projects)



Medical applications – National Research grant – CEEEX – 2005-2008 -
(Department of Manufacturing Engineering, TUCN)

**First step in writing a success proposal
scientific background (strong elements) - previous experience
(research projects)**



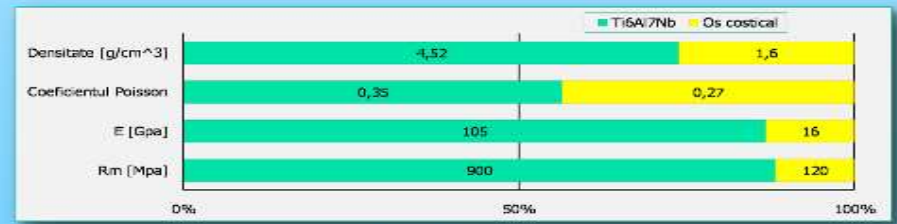
**Medical applications – National Research grant – PCCE - BIOMAPIM – 2010-2013
- (Department of Manufacturing Engineering , TUCN)**

First step in writing a success proposal scientific background (strong elements) - previous experience (research projects)

Comparison between the mechanical characteristics of the cortical bone and Ti6Al7Nb

	Al	Nb	Ta	Fe	O	C	N	H	Ti
Min [%]	5,5	6,5	-	-	-	-	-	-	88,0
Max [%]	6,5	7,5	0,50	0,26	0,20	0,08	0,05	0,009	84,9

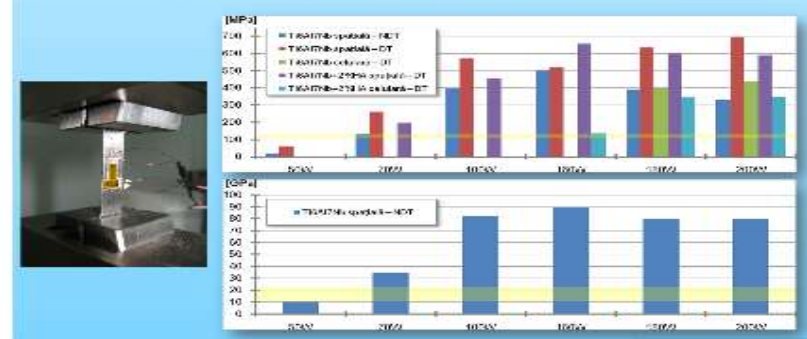
Caracteristica	T ₁ [°C]	T ₂ [°C]	Densitatea [g/cm ³]	R _m [MPa]	R _{m0,2} [Pa]	A [%]	E [GPa]	Coefficientul Poisson
Valoarea	1536-1646	1010±15	4,52	900	800	10	105	0,35-0,37



Experimental SLM research at DME

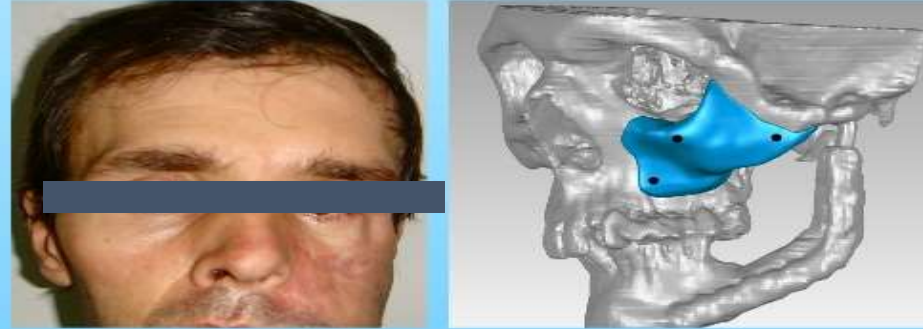


Mechanical characteristics

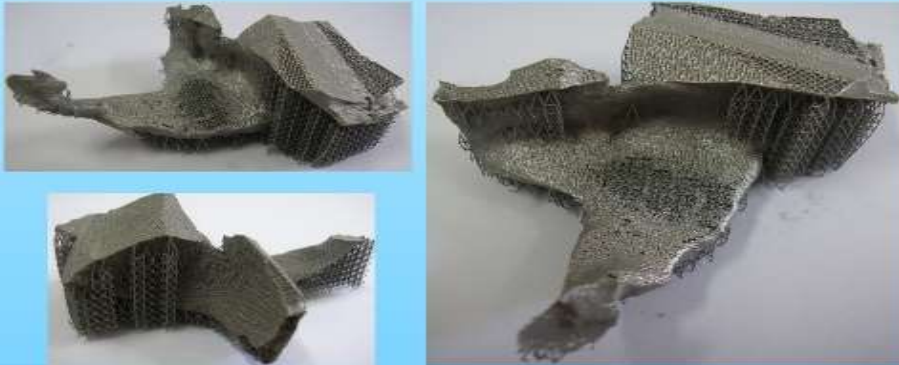


**First step in writing a success proposal
scientific background (strong elements) - previous experience
(research projects)**

**First surgical operation made in Romania, using a
metal implant made by SLM**



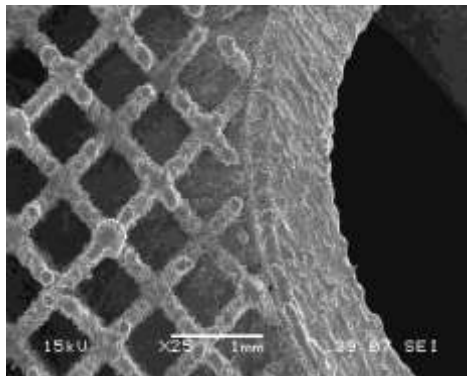
Titanium implants made by SLM at DME-TUCN



**First step in writing a success proposal
scientific background (strong elements) - previous experience
(research projects)**



Manufactured area	Scanning strategy	Laser power[W]	Scanning speed[mm/s]	Layer thickness [µm]
Implant supports	Hatch Solid	100	505	30
Solid areas	Stripes with skin	100	550	30
Porous structure	Stripes with skin	175	470	30



Customized medical implant made at SLM Solutions GmbH in Lubeck, Germany, using SLM 250 HL equipment

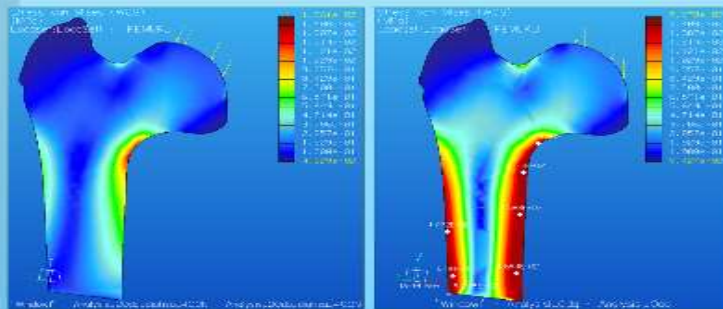
First step in writing a success proposal scientific background (strong elements) - previous experience (research projects)

Controlling porosity by the process parameters



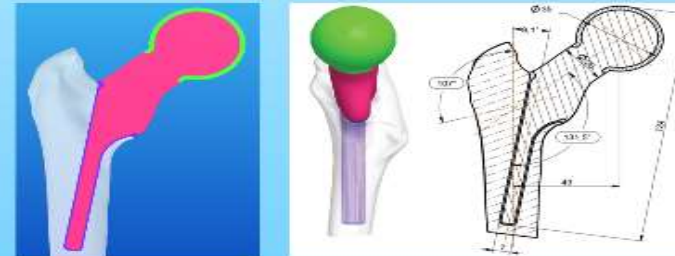
Samples made out of Ti based materials, with 0.6 mm hatching distance on X and Y

Stresses from the femur section, under 400 N force load



Multistructured endo-prosthesis - structure distribution. Geometrical characteristics

- magenta – 50W, red – 70W, green – 100W
- Solution with redesigned insert – multistructured endoprosthesis
- Considered materials – structures made with 50W, 70 W and 100 W

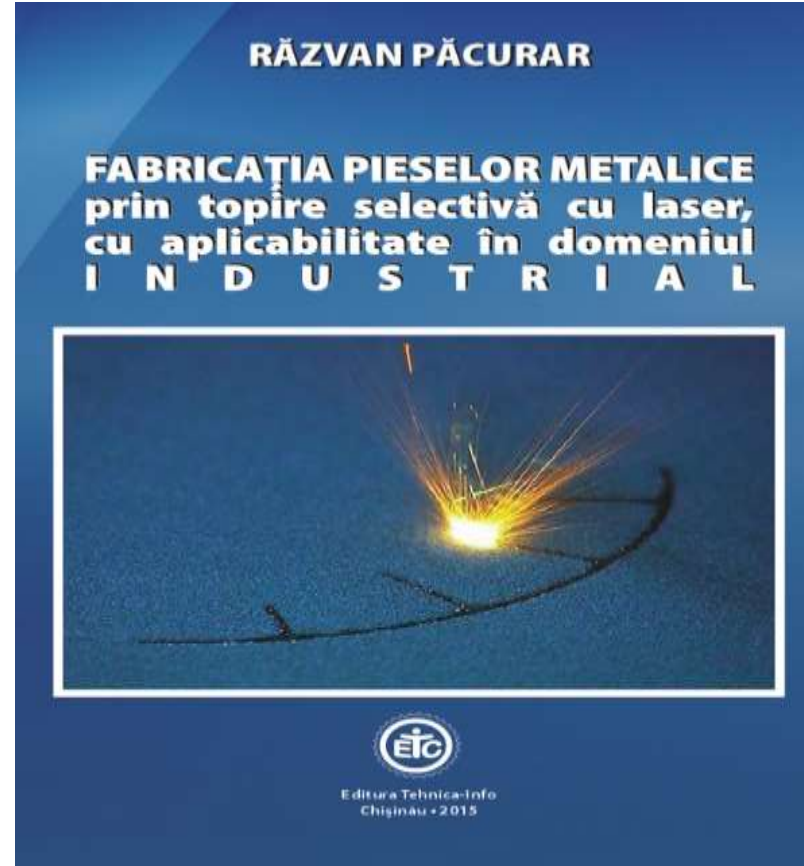


**First step in writing a success proposal
scientific background (strong elements) - previous experience
(research projects)**



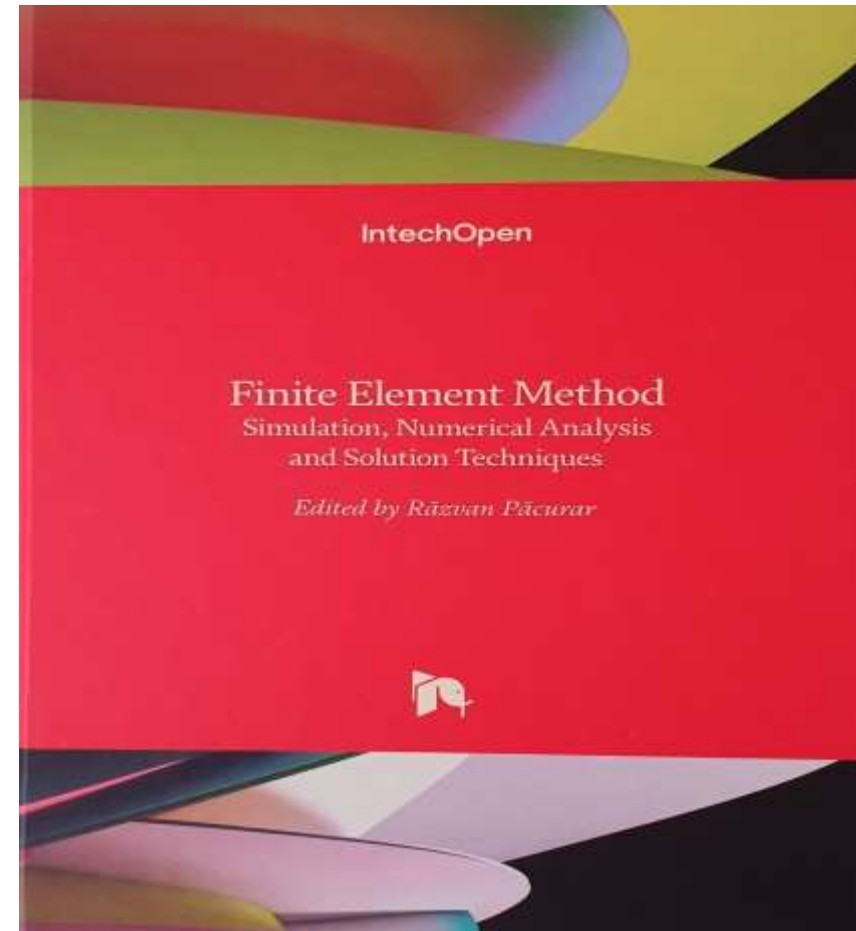
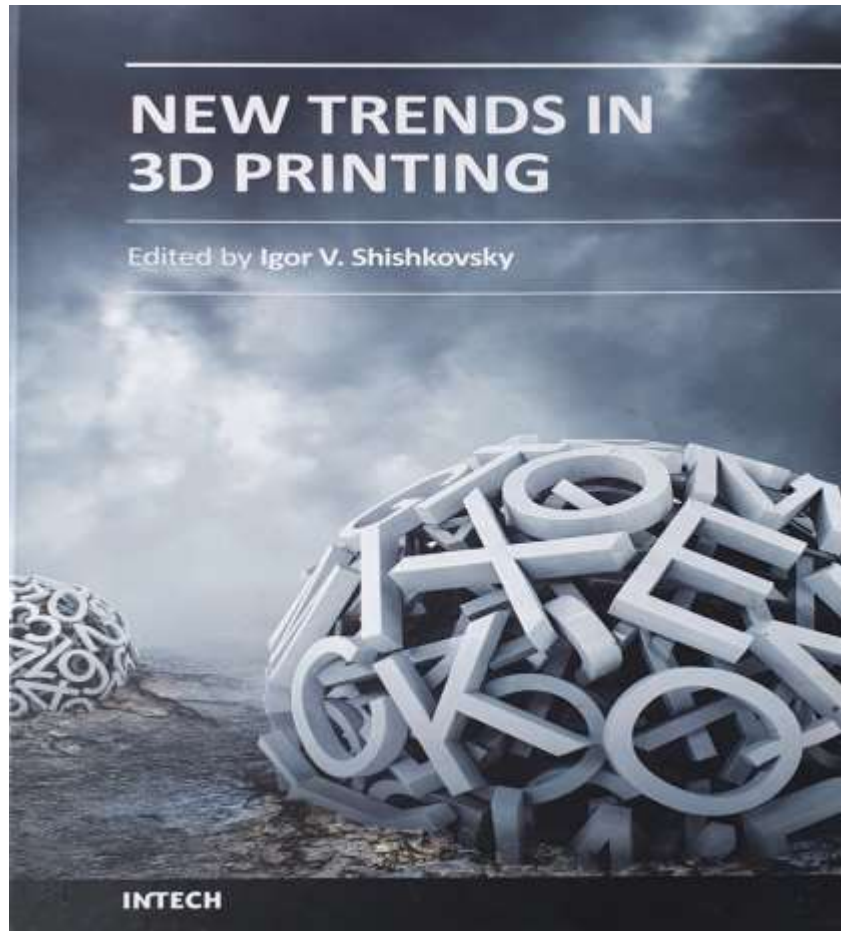
Medical applications – National Research grant – PCCE - BIOMAPIM – 2010-2013- (Department of Manufacturing Engineering , TUCN)

**First step in writing a success proposal
scientific background (strong elements) - previous experience
(books published in the field of the proposal)**



**Books / chapters of books published related to
research developed in the field of AM technologies**

**First step in writing a success proposal
scientific background (strong elements) - previous experience
(books published in the field of the proposal)**



First step in writing a success proposal scientific background (strong elements) - previous experience (scientific prizes and awards in the field of project proposal)

Premii ale Academiei Romane decernate in anul 2017

Premii ale Academiei Romane pe anul 2015 decernate in anul 2017

In domeniul Stiintelor Tehnice

Premiul HENRI COANDĂ

Lucrarea: Aplicațiile medicale ale tehnologiilor de fabricație prin adăugare de material

- autori : Petru Berce, Nicolae Bâlc, Dan Leordean, Cristina Borzan, Horea Chezan, Voicu Mager și Cristian Berce



Supporting letters from the major stakeholders in the field of project application



ROMANIA
CITY OF CLUJ-NAPOCA
MAYOR'S OFFICE
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email: administratie@clujnapoca.ro; telephone: +36-264-591.271; fax: +40-264-599.129
www.primariacajnapoca.ro | www.cajnapoca.ro | www.visitclujnapoca.ro

No.512057/105/19.10.2020

Cluj-Napoca, October 19th, 2020

Dear Associate Professor Răzvan Păcurar,

The purpose of this letter is to express our support for the project proposal entitled "BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" that is prepared for the program Erasmus+ Partnerships for Digital Education Readiness in the field of Higher Education (KA226-HED).

The topics of the BRIGHT project are of great interest for our entire community in the context of the CoVID 19. We are convinced that the proposed project can contribute in establishing strategic partnerships not only in teaching and training activities on-line for the students, but also in finding innovative methods to support hospitals and local community in joining our efforts in fighting against the CoVID 19.

Based on this aspects, we hereby wish to express our endorsement of the project entitled "BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" and we wish to express our institutional support in promoting and sustaining the aims and objectives of the BRIGHT project on local community level, so as the solutions proposed by the BRIGHT project could be used and implemented in saving lives of patients, especially in crisis periods caused by CoVID 19.

In addition, we will be glad, if it results necessary, to discuss any other possible ways of cooperation in this regard.

Yours sincerely,

Emil Boc

Mayor of Cluj-Napoca City



Dear Associate Professor Razvan Pacurar,

The purpose of this letter is to express our support for the project proposal entitled "BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" that is prepared for the program Erasmus+ Partnerships for Digital Education Readiness in the field of Higher Education (KA226-HED).

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In addition, we will be glad, if it results necessary, to discuss any other possible ways of cooperation in this regard.

Yours sincerely,

Valter Flego
Member of the European Parliament

Local office of MEP
Giardini 2, 52100 Pula

16/10/2020



Str. Dimitrie Cantemir 1
400067 Cluj-Napoca, Romania
www.transilvania-it.ro contact@transilvania-it.ro
Bianca Munteanu@transilvania-it.ro

Cluj-Napoca, 12.10.2020

To:

Assoc.Prof. PhD Razvan Pacurar
Manufacturing Engineering Department
Technical University of Cluj-Napoca
B-dul Muncii, no. 103-105, 400641
e-mail: razvan.pacurar@tucn.ckluj.ro

In support for the BRIGHT Project Proposal.

Dear Assoc. Professor Razvan Pacurar,

After being acquainted with the information provided by you, I hereby endorse the project proposal "BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" coordinated by TUCN - Technical University of Cluj-Napoca, Romania, for the program Erasmus+ Partnerships for Digital Education Readiness in the field of Higher Education (KA226-HED).

I confirm that the aforementioned project proposal provides topics of interest for our activity and we will try to support the project by:

- Attending webinars, workshops, seminars and demos
- Participating in dissemination of project results.

In addition, we will be glad, if it is necessary, to discuss any other possible ways of cooperation in this regard. Please, do not hesitate to contact me if you have any questions or concerns.

Yours sincerely,
Bianca Munteanu

Cluster Manager Transilvania

ROMANIA - MINISTERUL EDUCAȚIEI ȘI CERCETĂRII ȘI INOVĂRII
UNIVERSITATEA DE MEDICINĂ ȘI FARMACIE "IULIU HAȚEGANU" CLUJ-NAPOCA
FACULTATEA DE MEDICINĂ
DEPARTAMENTUL DE MEDICINĂ CONSILIARĂ
DISCIPLINA SĂNĂTATE PUBLICĂ ȘI MANAGEMENT
400083 Cluj-Napoca, România
Str. Avram Iancu nr. 31, et. 3
Tel: +40 264 414566
www.umfcluj.ro



Cluj-Napoca, September 2020

Letter of support

The purpose of this letter is to express our full support for the project entitled "BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" coordinated by TUCN - Technical University of Cluj-Napoca, Romania, for the program Erasmus+ Partnerships for Digital Education Readiness in the field of Higher Education (KA226-HED).

We are very interested about this topic in the context of the pandemic, since we really believe that the use of 3D printing solutions to produce parts that can be used in the hospitals for saving lives of the patients is a reliable one and could be used for producing parts that are vital in the context of the pandemic, especially in crisis periods, when the situations in hospital is really critical.

In this sense, we express our fully support for the BRIGHT: Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period" project coordinated by TUCN and we are convinced that the proposed project can contribute to the establishing of strategic partnerships between our institutions, in joining all our efforts for solving medical difficult issues related to the context of the pandemic.

We definitely consider this project as part of our strategy for developing of products, testing of new materials or equipment items for the medical sector, designing and testing of new products by 3D printing or producing parts that are needed especially in emergency situations and can be produced by 3D printing technologies in pandemic.

We confirm that the aforementioned project proposal provides definitely topics of high interest for our Institution and we will do all of our best to support and be actively involved in the BRIGHT project.

Yours sincerely,

Prof. Univ. Dr. Borzan Cristina



Main objectives and expected outcomes of the BRIGHT 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 the field of **3D printing methods used for producing medical parts in pandemic period**, comprised in:

- BRIGHT **support e-courses** related to the objective (based on one curriculum defined by the BRIGHT consortium in preamble)
- BRIGHT **e-toolkit manual** for digital learning (correlated with the support courses)
- BRIGHT **e-learning virtual laboratory** platform for developing, producing and testing of medical parts made by 3D printing (in correlation with the support courses and the toolkit)
- BRIGHT **e-learning webinars** on the use of 3D printing technologies in development, producing and testing of medical parts in pandemic period (video that shows in details all stages that are required to be fulfilled in the Rapid product development of a medical part by 3D printing (the videos are correlated with the support courses, toolkit and examples provided for teaching purposes on the e-virtual laboratory platform)
- BRIGHT **e-case studies** for project based learning method used in developing, testing and manufacturing of new medical products by 3D printing technologies in pandemic period (case studies are launched on the e-platform of BRIGHT project so professors and students can use the resources provided so far (i-iv) for developing, producing and testing of medical parts that are coming from medical sector, in cooperation with BRIGHT consortium and support of the SMEs)

The advantages of the BRIGHT methods will be that the **professors and students will gain knowledge and competences related to the developing, designing, producing by 3D printing methods and testing of medical products that are aimed to support medical institutions in the context of the pandemic.**

Quick overview of the Intellectual outputs related to the BRIGHT project

IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period (Prof. Milos Simonovic, University of Nis, Serbia)

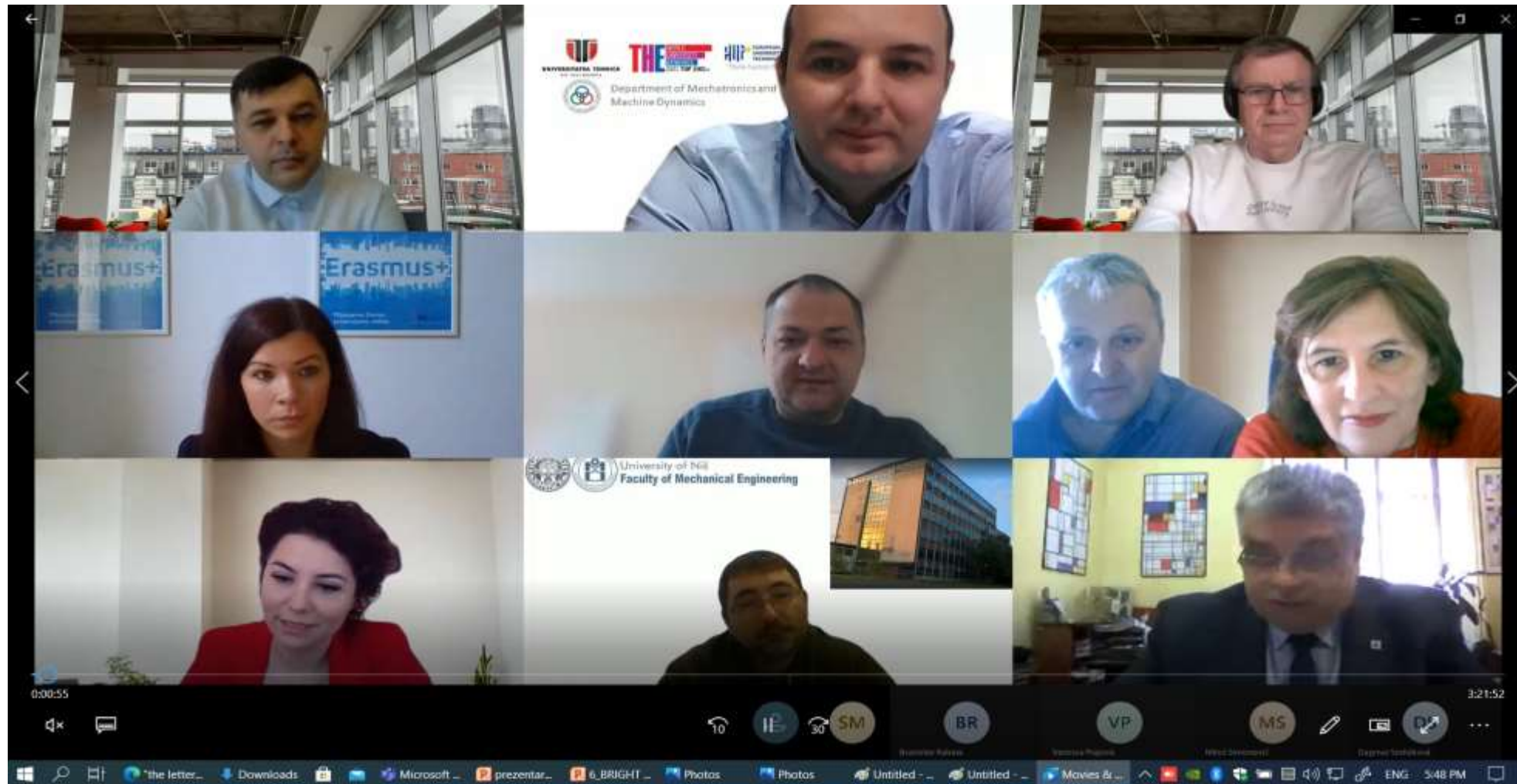
IO2 - BRIGHT e-toolkit manual for digital learning in producing medical parts by 3D printing methods in the context of the pandemic (Assoc. Prof. Răzvan Păcurar, TUCN, project manager)

IO3 - BRIGHT e-learning virtual laboratory platform for boosting the scientific capacity and innovation in teaching processes related to medical parts made by 3D printing methods in pandemic period (Assoc. prof. MSc. Eng. Peter Košťál, STU Bratislava)

IO4 - BRIGHT e-learning webinars on the use of 3D printing technologies in development, testing and producing of medical parts in pandemic period (Prof.dr.eng. Remigiusz Łabudzki, Technical Univ. of Poznan, Poland)

IO5 - BRIGHT e-case studies for project based learning method used in developing, testing and manufacturing of new medical products by 3D printing technologies in pandemic period (Assoc. Prof. Sven Maricic, University of Juraj Dobrila, Croatia)

BRIGHT – Kick off meeting – 19.03.2021 – TUCN, RO



BRIGHT – Kick off meeting – 19.03.2021 – TUCN, RO



IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period (**Prof. Milos Simonovic, University of Nis, Serbia**)

	1. CAD	Univ. of Poznan
	2. CAE	TUCN & University of Nis
	3. Materials Science and Strength of Materials	Univ. of Poznan & Univ Juraj Dobrila
	4. Flexible manufacturing systems	STU Bratislava
	5. 3D printing and Rapid Tooling methods for medicine	TUCN & University of Nis
Open access on the Platform?	6. Process optimization and software control	University of Nis
Reports?	7. Medical Engineering standards and tests	Univ Juraj Dobrila

Starting:
1.03.2021

Template?

Content?

Deadline:
31.07.2021

For each module according to the skills and competences of the BRIGHT 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 related to 3D printing methods and the particular applications of these technologies for **producing medical parts** / testing of new materials, etc.



BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA ROMANIA

BRIGTH International Summer School on:
3D printing
for medical applications

19 - 30
JULY
2021

WHO can apply
Bachelor students (BSc)
Master students (MSc)
PHD students

SPECIALIZATIONS:
Manufacturing Engineering
Mechatronics & Robotics
Mechanical & Bio-Mechanical Engineering
Science of Materials
Physics & Chemistry
Medicine & Pharmacy

More details
www.bright-project.eu
Registration until 1st of July 2021

Organized by
Technical University of Cluj-Napoca
In cooperation with

Co-funded by the
Erasmus+ Programme
of the European Union

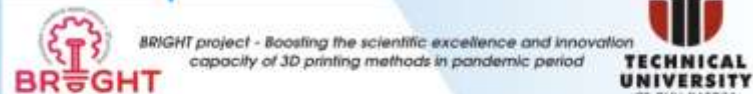
Logos: University of AG, University of Medicine and Pharmacy, STU, bm plast, bizzcom

1. CAD
2. CAE
3. 3D printing and Rapid Tooling methods for medicine
4. Process optimization and software control
5. Materials Science and Strength of Materials
6. Flexible manufacturing systems
7. Medical Engineering standards and tests

8. Virtual / augmented reality (VR / AR) experience
9. 3D printing companies presentations / 3D printing experience
10. Medical institutions presentations (about needs in pandemic)

11. Game on competition
12. Bright challenge debate
13. Virtual tours / visits
14. Round tables with experts coming from engineering / industrial / medical sectors

BRIGHT International Summer School – TUCN – 19 -31.07.2021



BRIGHT International Summer School on: **3D printing** for medical applications



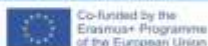
19 - 30
JULY
2021

**WHO
can apply**

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

SPECIALIZATIONS:

Manufacturing Engineering
Mechanics & Robotics
Mechanical & Bio-Mechanical Engineering
Science of Materials
Physics & Chemistry
Medicine & Pharmacy



More details

www.bright-project.eu

Registration until 1st of July 2021

Organized by
Technical University of Cluj-Napoca
in cooperation with



INTERNATIONAL SUMMER SCHOOL	
Final program	Eastern European Time (EET)
Monday 19.07.2021	
9:00 - 9:30 Opening and Welcome ceremony Rector of the Technical University of Cluj-Napoca, Romania: Prof.dr.ing. Vasile Tope City Hall Institution of Cluj-Napoca, Romania: Mayor Emil Boc Vice Rector with International relations of Technical University of Cluj-Napoca, Romania: Prof.dr.ing. Dan Măndru Dean of Faculty of Industrial Engineering, Robotics and Production Management (TUCN): Prof.dr.ing. Cornelia Brivescu Head of Manufacturing Engineering Department (TUCN): Assoc.Prof.dr.ing. Adrian Trif	
9:30 - 10:30 BRIGHT project and Summer School presentation: Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO Partners of BRIGHT project presentation	
10:30 - 10:45 25 years of success in 3D printing at TUCN: Prof.dr.ing. Petru Berce, TUCN, RO	
10:45 - 12:00 Applications of 3D printing in medicine developed within the National Centre of Innovative Manufacturing (TUCN): Prof.dr.ing. Niclas Bălc, TUCN, RO	
12:00 - 13:00 Lunch break	
13:00 - 14:00 CAD – Computer Aided Design (lecture): Prof.dr.ing. Filip Gorski, Univ. of Poznan, PL	
14:00 - 14:30 Presentation of the medical parts to be developed and realized by 3D printing + launching of teams competition: Prof.dr.ing. Filip Gorski, Univ. of Poznan, PL	
14:30 - 16:00 Dividing in groups. Groups socializing activity	
Tuesday 20.07.2021	
9:00 - 10:00 CAD laboratory part 1: selecting and working on medical parts prototypes design (groups)	
10:00 - 11:00 Structural optimization: topology optimization: Prof.dr.ing. Nikola Kostov, Univ. of Nis, SRB	
11:00 - 11:30 Medical imaging and project based learning: Prof.dr.ing. Nikola Vitkovic, Univ. of Nis, SRB	
11:30 - 12:00 Computational Design and Digital Fabrication: Prof.dr.ing. Panagiotis Kyriakos, Univ. of Western Macedonia, Greece	
12:00 - 13:00 Lunch break	
13:00 - 14:00 3D scanning for medical applications: Lecture dr.ing. Stefan Bodi, TUCN, RO	
14:00 - 15:00 Materials Science and Strength of Materials in medicine (lecture): Prof. dr.ing. Remigiusz Labudzki, Univ. of Pomezan, PL	
15:00 - 16:00 Defining the specific types of samples to be realized by 3D printing and to be tested (seminar): Assoc.Prof.dr.ing. Sorin Cornea, TUCN, RO	
Wednesday 21.07.2021	
9:00 - 10:30 CAD laboratory part 2: working on medical parts prototypes and designing of samples (groups)	
10:30 - 11:00 Validation of the proposed solutions by CAD experts – feedback (seminar): Prof.dr.ing. Filip Gorski, Univ. of Poznan, PL	
11:00 - 12:00 CAE – Computer Aided Engineering (lecture): Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
12:00 - 13:00 Lunch break	
13:00 - 14:30 CAE laboratory: working on medical parts prototypes and samples design (groups)	
14:30 - 16:00 Presentation of Materialise company (Leuven, Belgium): CAE / VR / 3D printing: Diana Skopina	
Thursday 22.07.2021	
9:00 - 10:00 Validation of the proposed solutions by CAE experts – feedback (seminar): Assoc.Prof.dr.ing. Sorin Cornea, TUCN, RO	
10:00 - 11:00 3D printing and Rapid Tooling (lecture): Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
11:00 - 12:00 Presentation of SLM Solutions company (Lubeck, Germany): Robin Bappert	
12:00 - 13:00 Lunch break	
13:00 - 14:00 3D printing laboratory 1: preparing the medical parts and samples to be printed (groups)	
14:00 - 15:00 Presentation of Speed3D company (Lubeck, Germany): Cold spray 3D metal printing, a new and fast technology for independent metal manufacturing: Stefan Ritt	
15:00 - 16:00 Presentation of Omni 3D company (Poznan, Poland): Mr. Krzysztof Kardach - Chief Technologist: Omni3D	
Friday 23.07.2021	
9:00 - 10:00 3D printing experience – feedback of the experts (workshop/ seminar): Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
10:00 - 11:00 3D printing laboratory 2: printing of the improved variants of medical parts and samples (groups)	
11:00 - 12:00 Process optimization and software control (lecture): Prof. dr.ing. Nikola Vitkovic, Univ. of Nis, SRB	
12:00 - 13:00 Lunch break	
13:00 - 13:30 Innovative strategies for medical applications: Corina Buzatu (City Hall Institution of Cluj-Napoca, Romania)	
13:30 - 14:00 Conclusions and round table discussion with all participants at the end of the 1 st week	
14:00 - 16:00 Virtual tour of Transylvania region	

INTERNATIONAL SUMMER SCHOOL	
Final program	Eastern European Time (EET)
Monday 26.07.2021	
9:00 - 9:30 Welcome introductory speech about the aims and objective of week no. 2 - Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
9:30 - 10:30 3D printing experience – final feedback on behalf of the 3D printing experts (seminar): Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
10:30 - 11:00 Experimental and computational strength analysis in biomedical engineering: Prof.dr.ing. Cristian Dutescu, TUCN, RO	
11:00 - 12:00 Morpho-structural analysis of structures made of biomaterials: Prof.dr.ing. David Nemes, TUCN, RO & Assoc. Prof. dr. ing. Diana Bălibă, Politechnic University of Bucharest, RO	
12:00 - 13:00 Lunch break	
13:00 - 14:00 3D printed microfluidic systems for biomedical applications: Prof.dr.ing. Popa Catalin, TUCN, RO	
14:00 - 15:00 Mechanical testing of samples realized by 3D printing processes and SEM analysis: Mechanical testing of orthosis: PhD.ing. Radzslaw Wichniarek, Univ. of Poznan, PL Mechanical testing of standard samples: MSc.ing. Filip Sierbowski, Univ. of Poznan, PL Preparation and SEM microscopic examinations: MSc.ing. Maria Rafajczak, Univ. of Poznan, PL	
15:00 - 16:00 Presentation of 3D systems company (Baden, Germany): Business Development Manager Healthcare: Stefan Kapp, DE	
Tuesday 27.07.2021	
9:00 - 10:00 Validation and Interpretation of the results by mechanical and SEM testing experts – feedback (seminar): Prof.dr.ing. Remigiusz Labudzki, PhD.ing. Radzslaw Wichniarek, MSc.ing. Filip Sierbowski, MSc.ing. Maria Rafajczak & Lecture dr.ing. Cristian Vitcu	
10:00 - 11:00 BRIGHT - preparing of the final presentations by students (groups)	
11:00 - 12:00 The engineering behind 3D printing of a human pancreas: Calin Brandabur, Syntex 3D company, Romania	
12:00 - 13:00 Lunch break	
13:00 - 14:00 Presentation of amisionTEC Bio-printing company (Gladbeck, Germany): dipl.chem. Carlos Cervalho, DE	
14:00 - 15:00 Presentation of Stratasys company: Anatomically realistic 3D printed models from Stratasys, Mr. Amadoul Toutain, Senior Manager Healthcare EMEA Stratasys (Baden, Germany) and Cristian Focul (Halechologies, Romania)	
15:00 - 16:00 Virtual reality laboratory for medical applications: Prof.dr.ing. Miha Manic, Virginia Commonwealth University, USA	
Wednesday 28.07.2021	
9:00 - 10:00 Flexible manufacturing systems in medical applications (lecture): Prof.dr.ing. Peter Kostar, STU, SK	
10:00 - 11:00 Using and Integrating CAD / CAM solutions in medicine manufacturing: Prof.dr.ing. Peter Kostar, STU, SK	
11:00 - 12:00 Biomedical applications and challenges: Prof.dr.ing. Miroslav Trajanovic, Univ. of Nis, SRB	
12:00 - 13:00 Lunch break	
13:00 - 14:00 Innovative Robots for Medical Applications: New Trends and Challenges: Prof.dr.ing. Doina Pasia, TUCN, RO	
14:00 - 15:00 The applications of 3D rapid prototyping technologies in craniomaxillofacial surgery: dr. Horatiu Rotaru, Univ. of Medicine and Pharmacy, RO	
15:00 - 16:00 Presentation of CAD Works company (Craiova, Romania): SolidWorks, SolidCAM & 3D Printing: Dumitru Jucan, RO	
Thursday 29.07.2021	
9:00 - 10:00 Medical engineering standards and tests (lecture): Assoc.Prof.dr.ing. Sven Maric, UNIPU, HR	
10:00 - 10:30 The use of VR and AR for medical applications: Assoc.Prof.dr.ing. Sven Maric, UNIPU, HR Ciprian Oseanu, TUCN, RO; Lecturer dr.ing. Alin Plesu, TUCN, RO	
10:30 - 11:00 Mesh applications for VR: Assoc.Prof.dr.ing. Dan Sergiu Stan, TUCN, RO	
12:00 - 13:00 Lunch break	
13:00 - 14:00 Presentation of Sufix 3D company (Belgrade, Serbia): Affordable professional 3D solutions for Medical applications: Milol Montirovic & Mladen Bogocnik, SRB	
14:00 - 14:30 Presentation of VR / AR applications developed by BIZZCOM company (Bucary, Slovakia): Branislav Rabara, SK	
14:30 - 15:00 BRIGHT evaluation of students	
15:00 - 16:00 BRIGHT test corrections. BRIGHT answering related to the test questions. Fulfiling of BRIGHT final questionnaire (groups)	
Friday 30.07.2021	
9:00 - 10:15 Presenting of the 3D printed parts and reports related to the research performed by the groups (seminar): Prof.dr.ing. Filip Gorski, Univ. of Poznan, PL	
10:15 - 10:30 BRIGHT winning awards - prof. dr.ing. Filip Gorski, Univ. of Poznan, PL + Associate Prof.dr.ing. Răzvan Păcurar, TUCN, RO	
10:30 - 11:00 Presenting of developing common research projects focused on specific topics related to medicine – Development Agency of The North-West Region of Romania (part 1): Cristian Ogoan, Department of Intelligent Specialization, RO	
11:00 - 11:30 Presenting of developing common research projects focused on specific topics related to medicine – Development Agency of The North-West Region of Romania (part 2): Laviniu Chig, Department of INNO Platform, RO	
11:30 - 12:00 Presenting and opportunities of joining research projects, Banca Municipală Transilvania IT Cluster, RO	
12:00 - 12:15 Presenting and opportunities of joining research projects at local and regional level, Emilia Sotolan, City Hall Institution of Cluj-Napoca, RO	
12:15 - 13:00 Round table with medical and industrial partners of BRIGHT. Defining of potential common topics for future collaboration. Defining of possible diploma projects - Assoc.Prof.dr.ing. Dan Sergiu Stan, TUCN, RO	
13:00 - 14:00 Lunch break	
14:00 - 14:30 Presenting of disseminating opportunities MDPI Romania: HR Manager Ivana Pejin and Ms. Anca Banu, RO	
14:30 - 15:00 Presenting of publishing opportunities & launching of new book, Danjela Duric, Intech Publishing House of Rijeka, HR	
15:00 - 16:00 BRIGHT closing ceremony. Future perspectives & activities of the BRIGHT project – Assoc.Prof.dr.ing. Răzvan Păcurar, TUCN, RO	

Highly intense program but with many achieved goals

<https://bright-project.eu/>



for the BRIGHT project

BRIGHT International Summer School – TUCN – 19 -31.07.2021

Big thank to all the participants to the BRIGHT International Summer School 2021 edition

BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA ROMANIA

BRIGHT International Summer School on:
3D printing
for medical applications

19 - 30 JULY 2021

WHO can apply
Bachelor students (BSc)
Master students (MSc)
PhD students

SPECIALIZATIONS:
Manufacturing Engineering
Mechatronics & Robotics
Mechanical & Bio-Mechanical Engineering
Science of Materials
Physics & Chemistry
Medicine & Pharmacy

Co-funded by the Erasmus+ Programme of the European Union

www.bright-project.eu
Registration until 1st of July 2021

Organized by
Technical University of Cluj-Napoca
In cooperation with



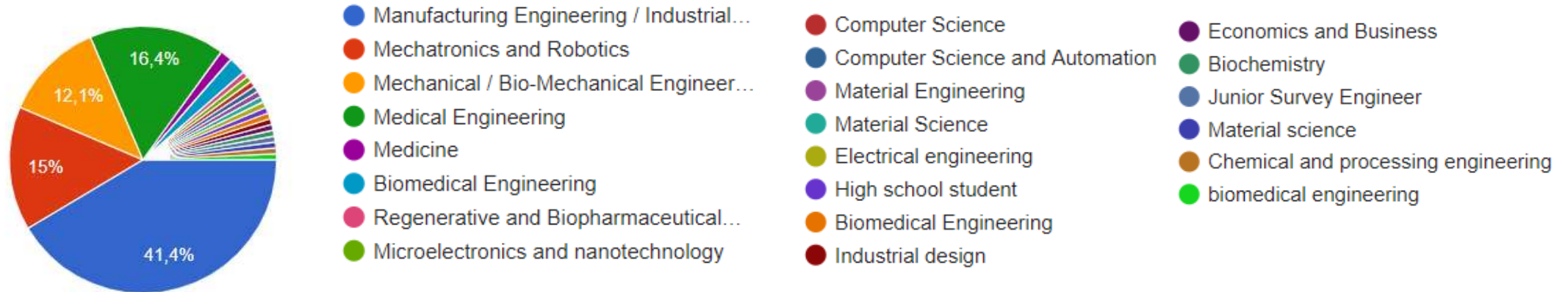
BRIGHT International Summer School KPIs
WOW! 350 participants from more than 20 countries registered!!!



Fulfilling of BRIGHT questionnaire on the BRIGHT project website

Specialization

140 de r. 133 insuri



Specializations of BRIGHT International Summer School 2021 participants

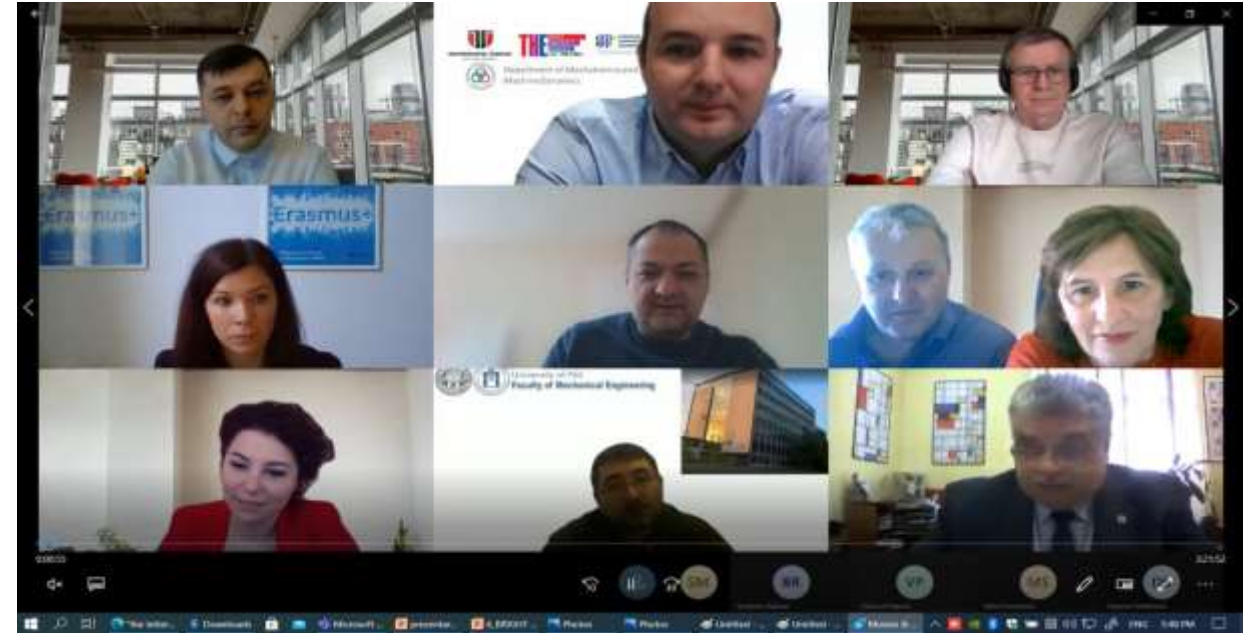
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1st week progress – Opening ceremony



Opening ceremony



Project and partners' presentation

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Presentation of the course modules that were prepared for IO1 which was ending in 31.07.2021



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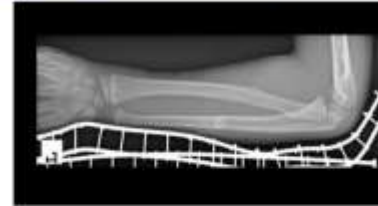


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Computer Aided Design of 3D printed medical products

Filip GÓRSKI, PhD, DSc, BEng, Associate Professor
Poznan University of Technology,
Faculty of Mechanical Engineering
filip.gorski@put.poznan.pl

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Janek and his fancy 3D printed broken arm stabilizer
3 iterations in 3 days!



CAD module held by Prof. Filip Gorski, Univ of Poznan, PL

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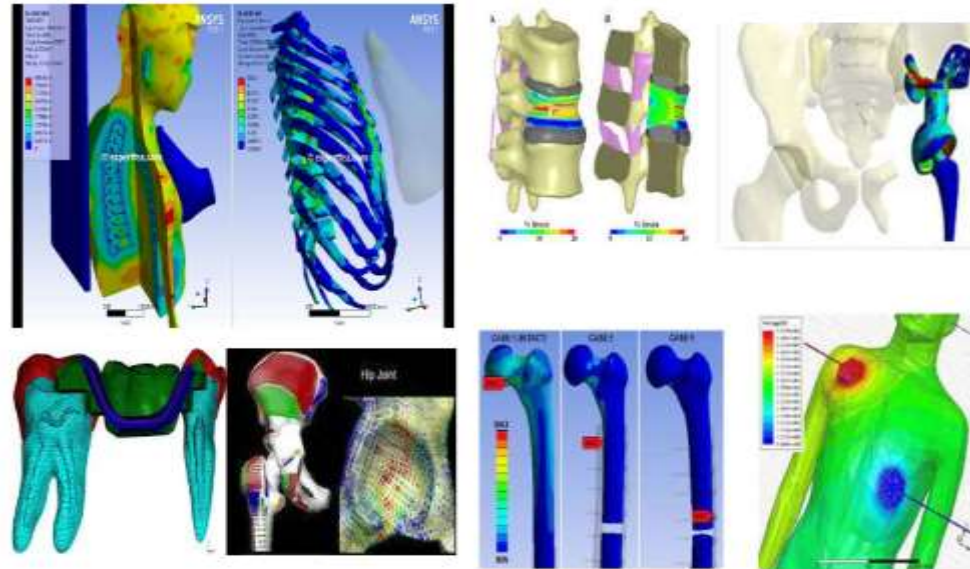


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Computer Aided Engineering for Medical Applications

Assoc. Prof.dr.eng. Razvan Pacurar
Department of Manufacturing Engineering,
Faculty of Industrial Engineering, Robotics & Production Management,
TUCN, RO

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CAE module held by Associate Prof. Razvan Pacurar, TUCN, RO

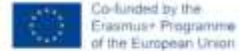
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Presentation of the course modules that were prepared for IO1 which was ending in 31.07.2021



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Multi-materials 3D printing and bio 3D printing technologies

3D Printing and Rapid Tooling Methods for Medical Applications

Assoc. Prof.dr.eng. Razvan Pacurar
Department of Manufacturing Engineering,
Faculty of Industrial Engineering, Robotics & Production Management,
TUCN, RO



Applications of 3D printing and bioprinting technology



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3D printing and Rapid Tooling module held by Associate Prof. Razvan Pacurar, TUCN, RO

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Presentation of the course modules that were prepared for IO1 which was ending in 31.07.2021



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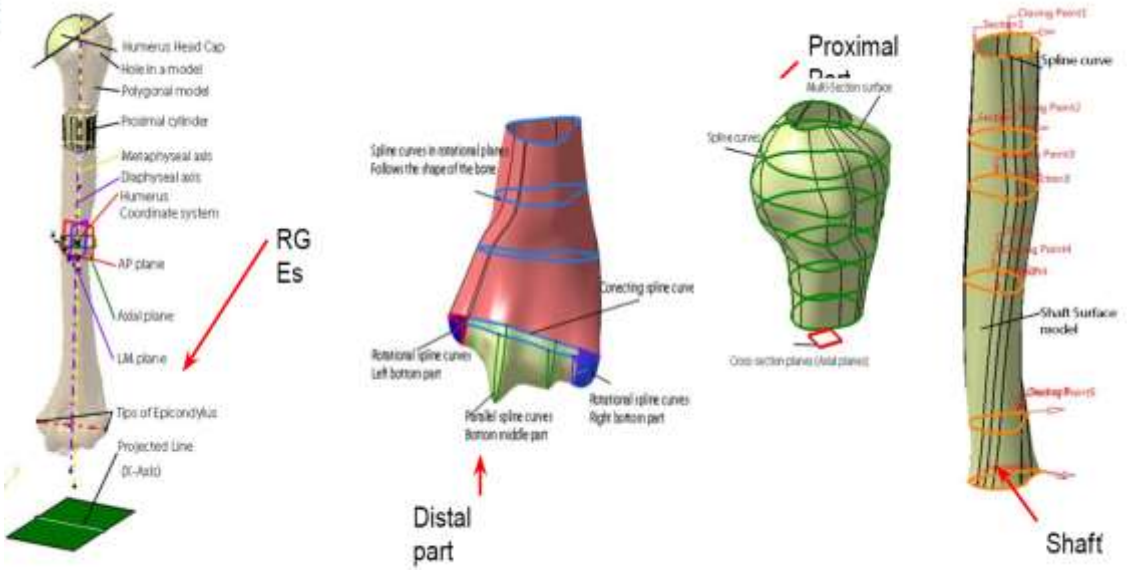


University of Nis
Faculty of Mechanical Engineering

PROCESS OPTIMIZATION AND SOFTWARE CONTROL

Ass. Prof. Nikola Vitković
Laboratory for Intelligent Production Systems – LIPS
Head of Information system
University of Nis, Faculty of Mechanical Engineering, Serbia

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Process optimization and software control module held by Associate Prof. Nikola Vitkovic, Univ. of Nis, SRB

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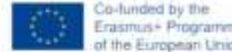


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Presentation of the course modules that were prepared for IO1 which was ending in 31.07.2021



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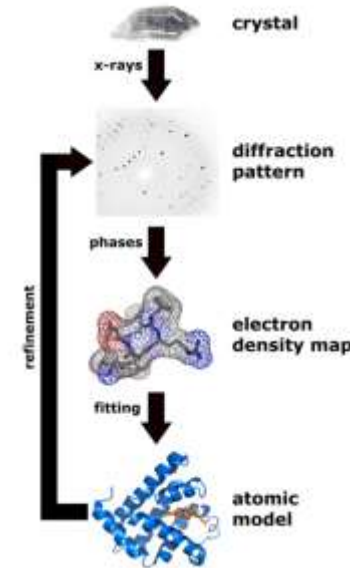


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Materials Science and Strength of Materials in medicine

Remigiusz ŁABUDZKI, PhD Eng (remigiusz.labudzki@put.poznan.pl),
Faculty of Mechanical Engineering
POZNAN UNIVERSITY OF TECHNOLOGY
POLAND

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Materials Science and Strength of Materials held by Prof. Remigiusz Labudzki, Univ of Poznan, PL

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Flexible manufacturing systems in medical applications

Peter Košťál, Vanessa Prajová



New kinematics for industrial robots

A parallel manipulator is a mechanical system that uses several computer-controlled serial chains to support a single platform, or end-effector. Perhaps, the best known parallel manipulator is formed from six linear actuators that support a movable base for devices such as flight simulators. This device is called a Stewart platform in recognition of the engineers who first designed and used them.

video



Medical replacements manufacturing

Join replacements

- In the US alone, surgeons perform more than 600,000 knee replacements and about 330,000 hip replacements each year.



manufacturing_1



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Flexible manufacturing systems in medical applications module held by Prof. Peter Kostal, STU Bratislava, SK

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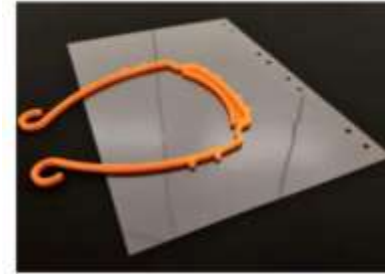
Presentation of the course modules that were prepared for IO1 which was ending in 31.07.2021



Medical Engineering Standards and Tests



Sven Maricic, Ivan Veljovic, Matea Grdic



Medical engineering and test module held by Prof. Sven Maricic, Univ. of Juraj Dobrila, Istria, HR

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BRIGTH International Summer School on:

3D printing

for medical applications

Beside modules related to IO 1 – other lectures related to the topic of the BRIGTH International Summer school were held by colleagues of the BRIGTH consortium, but also out of the consortium (with open access / free of charge)

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Lectures and presentations held by other participants at BRIGHT event



Applications of 3D printing in medicine, developed within the National Centre of Innovative Manufacturing (TUCN)

Nicolae Balc, Petru Berce, Mihaela Băciuț, Grigore Băciuț, Horațiu Rotar, Cristian Dinu
 Horea Chezan, Răzvan Păcurar, Dan Leordean, Cosmin Cosma, Paul Bere, Mihaela Hedeșiu, Avram Manea, Sebastian Stoia, Tiberiu Tamaș, Mădălina Lazăr



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Reverse engineering in medical applications

Lect. Eng. Stefan BODI, Ph.D.

stefan.bodi@muri.utcluj.ro



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Lectures and presentations held by other participants at BRIGTH event



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UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA
DEPARTMENT OF MECHANICAL ENGINEERING

Experimental and computational strength analysis in biomedical engineering

Prof. Dr.-Ing Mircea Cristian DUDESCU

Finite Element Analysis
Static structural / Composites / Explicit Dynamics / Topological optimization

ANSYS Academic and Research 2019R2

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Lectures and presentations held by other participants at BRIGHT event

BIOMAT
BIOMATERIALS RESEARCH GROUP

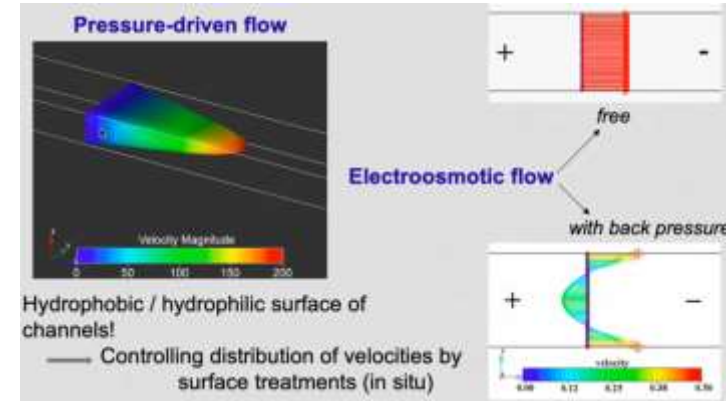
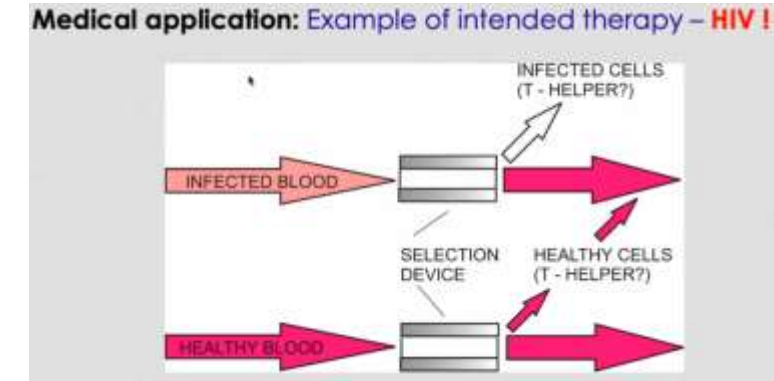
3D PRINTED MICROFLUIDIC SYSTEMS FOR BIOMEDICAL APPLICATIONS

Cătălin Popa, Alexandra Csapai
catalin_popa@stm.utcluj.ro

Technical University of Cluj-Napoca
Faculty of Materials and Environmental Engineering
Department of Materials Science and Engineering
Biomaterials Research Group

"Bionic Man" – Touch Bionics, Smithsonian (2013)

World's most complete bionic man



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Lectures and presentations held by other participants at BRIGHT event



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**Innovative Robots for Medical Applications:
New Trends and Challenges**

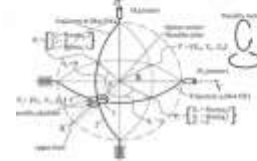
Prof. Doina PISLA, PhD

Technical University of Cluj-Napoca, Romania

28.07.2021



Kinematic scheme and CAD simulations (results published in Sustainability)



Final design



Experimental model



Clinical trials



(published patent OSIM 132233/14.06.2017)

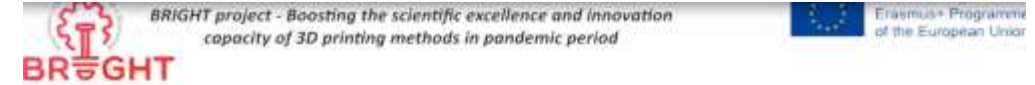
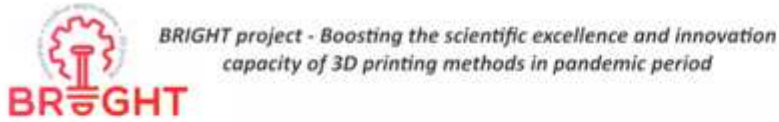
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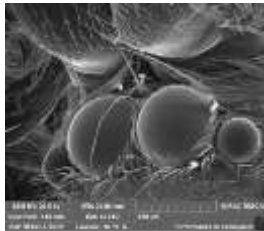


Lectures and presentations held by other participants at BRIGHT event



Mechanical testing of samples realized by 3D printing processes and SEM analyses

Preparation and SEM Microscopic Examinations



MSc. Eng. Maria Ratajczak
maria.ratajczak@put.poznan.pl



Anisotropy of 3D-printed materials

Cristian VILĂU, Dan-Sorin COMȘA
TU Cluj-Napoca, Romania
Tuesday, 27th July 2021, 9:00-10:00 EET



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Lectures and presentations held by other participants at BRIGTH event



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STRUCTURAL OPTIMIZATION: TOPOLOGY OPTIMIZATION

Nikola Korunović, Assoc. Prof.
korunovic.nikola@gmail.com
Jovan Arandjelović, Asst.
Faculty of Mechanical Engineering in Nis



Computational Design and Digital Fabrication Lab

Panagiotis Kyratsis
University of Western Macedonia, Greece
www.kyratsis.com



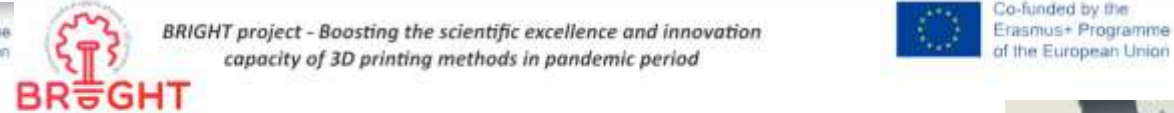
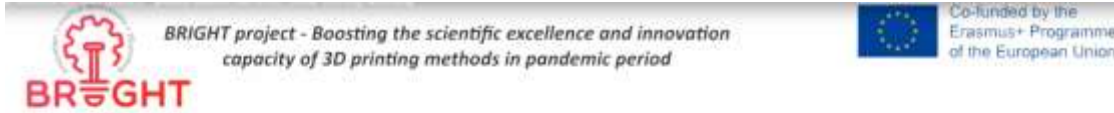
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Seminars held by colleagues at BRIGHT event



Mechanical testing of standard samples

Filip Sarbinowski, MSc Eng
filip.j.sarbinowski@doctorate.put.poznan.pl
 Faculty of Mechanical Engineering
 Poznan University of Technology



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Mechanical testing of orthoses and prostheses

Radosław WICHNIAREK
 Poznan University of Technology,
 Faculty of Mechanical Engineering
radoslaw.wichniarek@put.poznan.pl



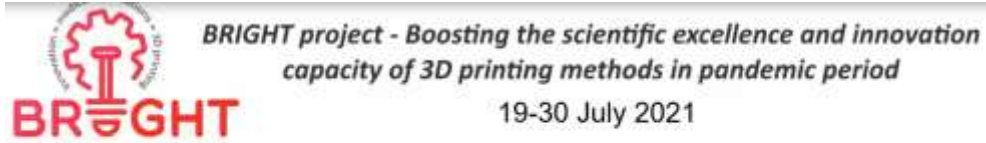
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Lectures and presentations held by other participants at BRIGHT event



Biomedical applications and challenges

- Personalised approach -

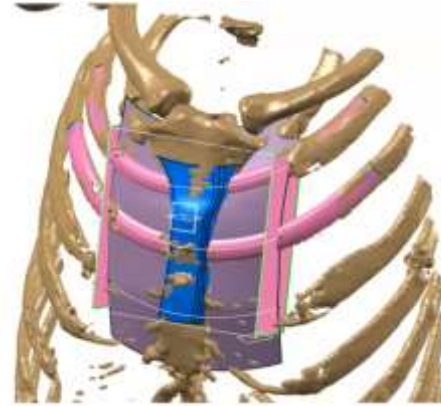
Prof. Dr Miroslav Trajanović

University of Niš, Faculty of Mechanical Engineering

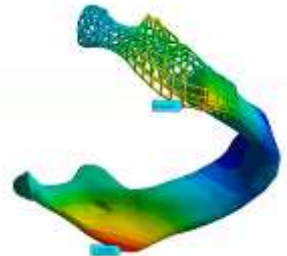
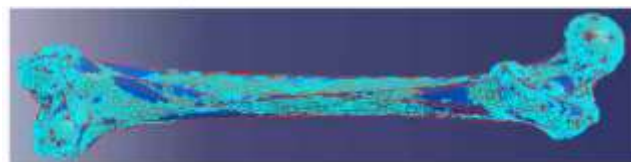
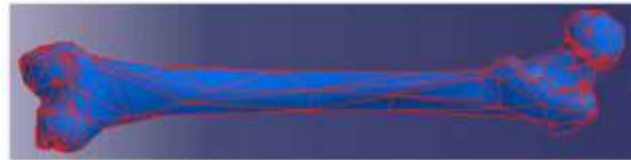
28 July 2021



III41017 Virtual human osteoarticular system and its application in preclinical and clinical practice



- Endoprotheses
- Fixators
- Macro-scaffolds



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Lectures and presentations held by other participants at BRIGTH event

BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period

BRIGTH International Summer School on:

3D printing
for medical applications

Applications of 3D printing in medicine at STU MTF in Trnava

Slovak University of Technology in Bratislava
Faculty of Materials Science and Technology in Trnava
Institute of Production Technologies

Advanced Engineering s.r.o.
Veterná 8760/43
917 01 Trnava, Slovakia

Ivan MOLNÁR, Dávid MICHAL

3 LIFE-SIZE HUMAN MODEL

- Material Extrusion process – FFF additive method – skeleton model
- Fused thermoplastic fibres extruded from the tip of a heated printing head moving in the X and Y axes
- Omni Factory 2.0 (Omni3D) and Sigmax R19 (BCN3D Technologies) production devices/3D printers
- Acrylonitrile Butadiene Styrene (ABS) – plastic material
- Production time – 621 hrs



Fig. 9 Several parts of the skeleton model produced by FFF additive method


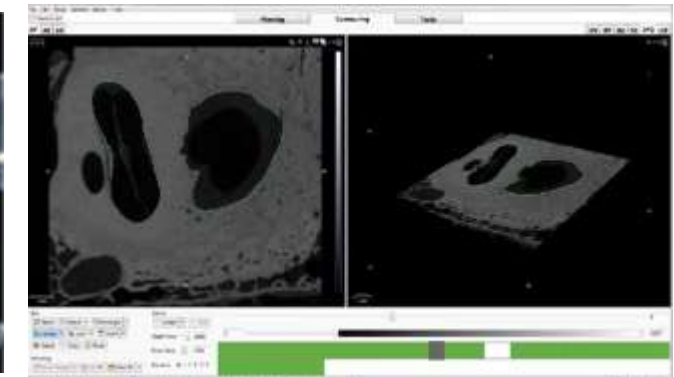
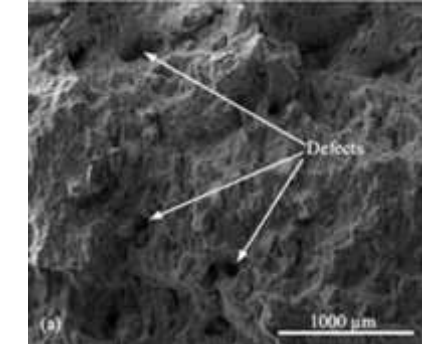
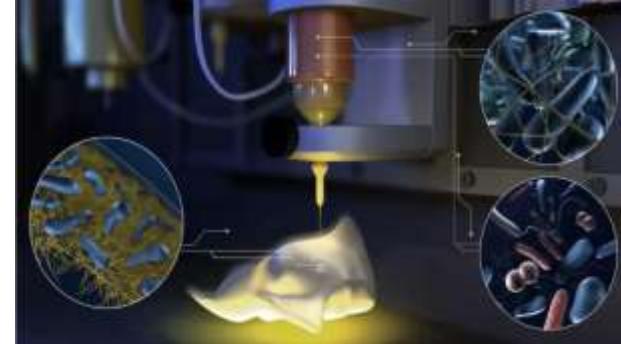


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Lectures and presentations held by other participants at BRIGHT event

Morpho-structural analysis of materials used in Additive Manufacturing

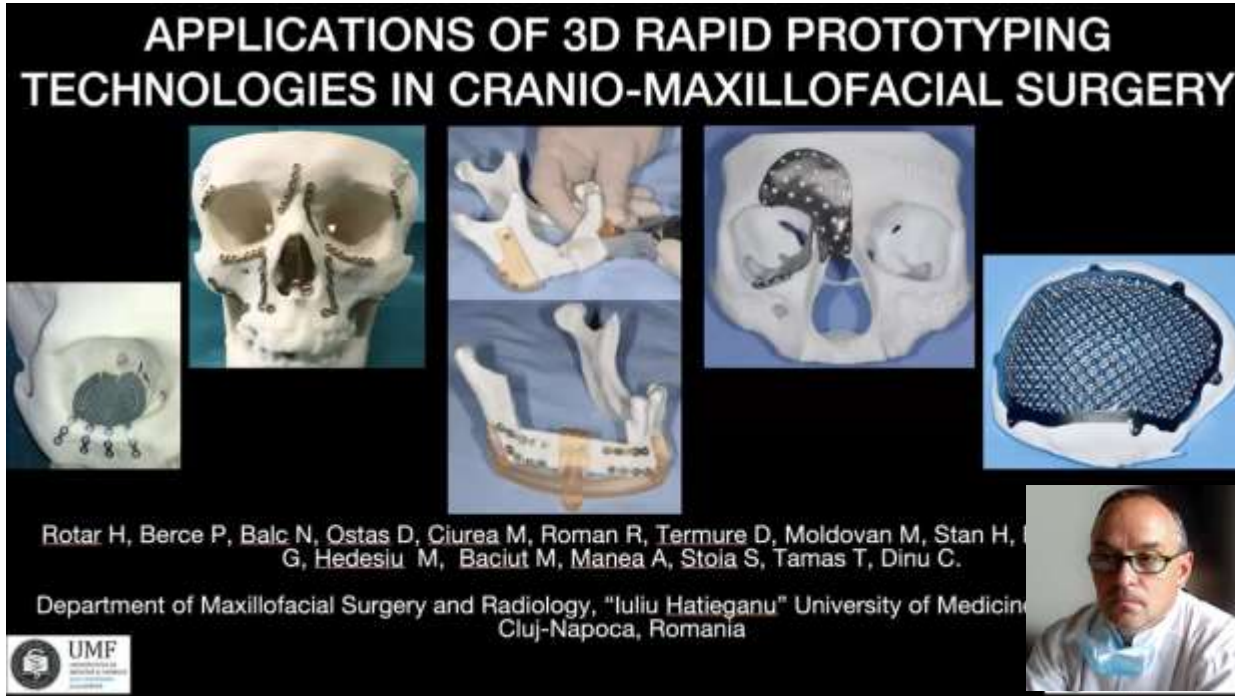
Assoc. Prof. Dr. Eng. Băilă Diana-Irinel
University POLITEHNICA of Bucharest, Romania
Faculty of Industrial Engineering and Robotics

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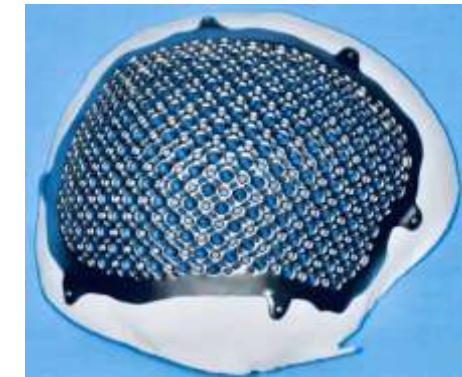
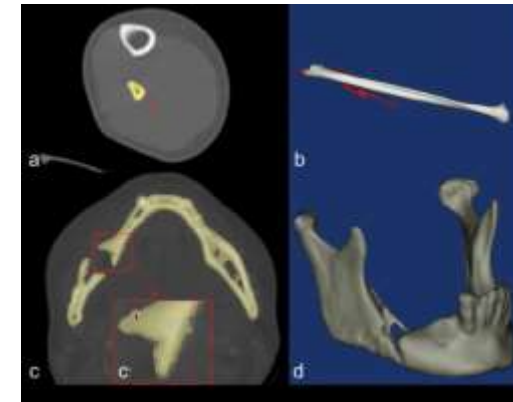
Lectures and presentations held by other participants at BRIGHT event

APPLICATIONS OF 3D RAPID PROTOTYPING TECHNOLOGIES IN CRANIO-MAXILLOFACIAL SURGERY



Rotar H, Berce P, Balc N, Ostas D, Ciurea M, Roman R, Termure D, Moldovan M, Stan H, G, Hedesiu M, Baciut M, Manea A, Stola S, Tamas T, Dinu C.

Department of Maxillofacial Surgery and Radiology, "Iuliu Hatieganu" University of Medicine Cluj-Napoca, Romania

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Lectures and presentations held by other participants at BRIGTH event




*VR in Medical Applications
Surgeon Training for Pelvic Surgeries*



*Milos Manic, PhD, Fellow IEEE
Professor, Virginia Commonwealth University*




VR in Medical Applications
Surgeon Training for Pelvic Surgeries



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Lectures and presentations held by other participants at BRIGTH event



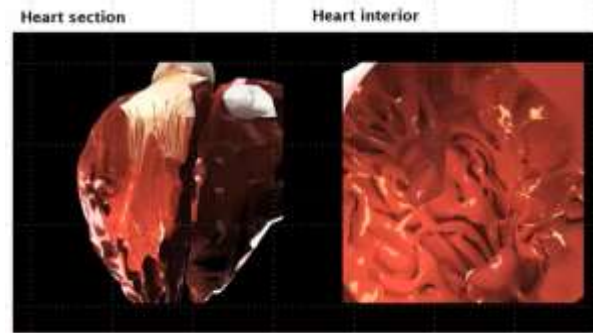
Virtual Reality for SURGICAL simulation

Ciprian Onetiu - Dynamic Digital Design
ciprian@3Ddesign.ro

3D DESIGN
 Branding / VR / AR / Aviatia / Medica / E-Learning platforme

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Logos: TECHNICAL UNIVERSITY OF CLUJ-NAPOCA, STU (Slovak University of Technology in Bratislava), bizzcom, bm plast



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BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



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Applications for VR developed at TU Cluj-Napoca

Assoc. Prof. Dr. Eng. Sergiu-Dan STAN



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Virtual Reality Software



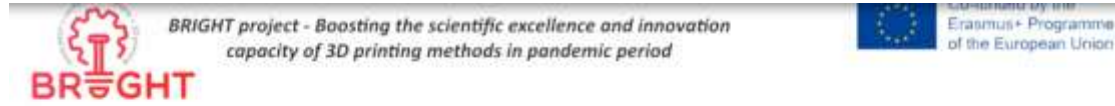
VR devices used



There is also increasing use of the Oculus Rift within curricula in other fields such as marketing, architecture, clinical education, computer science and paramedics.

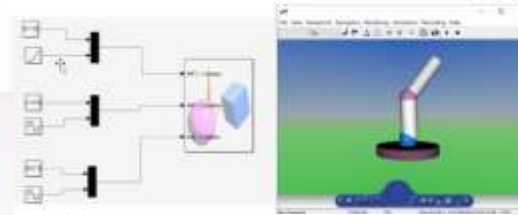
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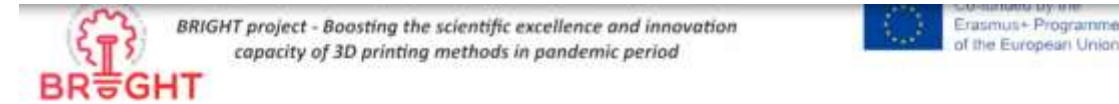


Applications for VR developed at TU Cluj-Napoca

Research. Eng. Alexandru OARCEA

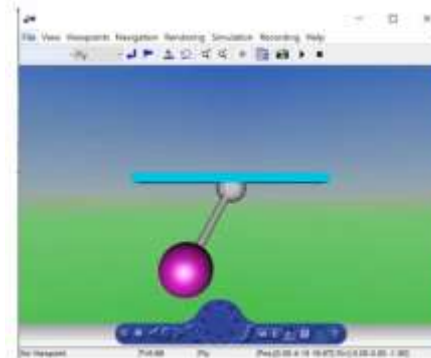


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Applications for VR developed at TU Cluj-Napoca

Research Eng. Victor Cobilean



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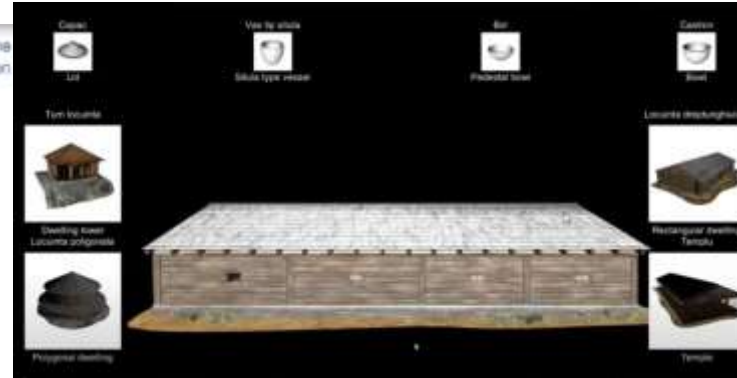
SW to VR

By Lecturer dr.eng. Alin Plesa
Alin.PLESA@mdm.utcluj.ro



Applications for VR developed at TU Cluj-Napoca

Lecturer. Dr. Eng. Florin POPISTER



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Companies and presentations of different important organizations

BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period

TECHNICAL UNIVERSITY OF CLUJ-NAPOCA ROMANIA

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for medical applications

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- Mechatronics & Robotics
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- Science of Materials
- Physics & Chemistry
- Medicine & Pharmaceutics

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materialise mimics care suite
Revolutionizing patient-specific treatment

Prepare your surgeries with precise, image-based planning
Visualize patient anatomy with 3D-printed models
Achieve exact results with our surgical cutting guides
Improve surgery outcomes with patient-specific implants

Cloud-based web viewer: VR friendly

Diana Skopina, Materialise (Leuven, Belgium)



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Selective Laser Melting for Qualified Serial Production of Medical Devices

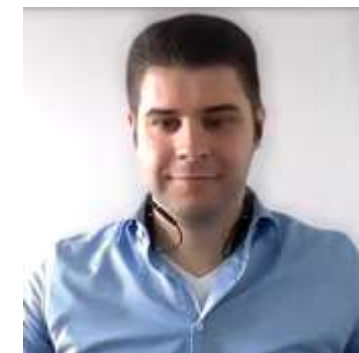
Philip Oris, Business Development Director Healthcare, SLM Solutions
 Robin Bappert, Application Engineer Healthcare, SLM Solutions
 philip.oris@slm-solutions.com robin.bappert@slmsolutions.com



Closed-Loop Powder Handling Automated PSV

1. Powder loading into 90 liter tank
2. Powder exits the hopper into the sieve
3. Powder transported to the machine via pneumatic vacuum system
4. Sieved powder enters the machine then is deposited into the recoater
5. Used powder exits the machine
6. Reclaimed powder returns to the hopper for sieving

- Safety:** Door-integrated glove box eliminates operator exposure to open powder
- Efficiency:** Vacuum hose located in the build chamber delivers powder directly to the sieve
- Quality:** Minimized powder handling outside an inert atmosphere maintains powder quality
- Efficiency:** Reduced auxiliary times by eliminating manual



Robin Bappert, SLM Solutions GmbH (Lubeck, DE)

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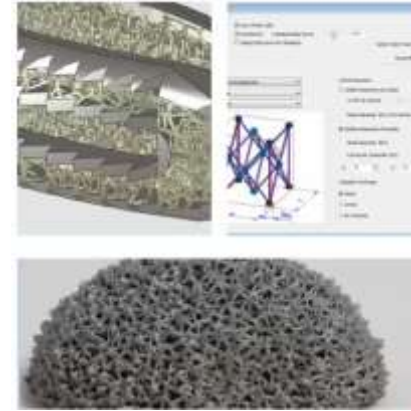
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3D SYSTEMS

3D printing in healthcare applications

Stefan Kapp
Business Development Manager EMEA, Healthcare
Stefan.Kapp@3dsystems.com

We are the leaders in enabling *additive manufacturing solutions* for applications in growing markets that demand *high reliability products*.



Stefan Kapp, 3D systems company (Baden, Germany)



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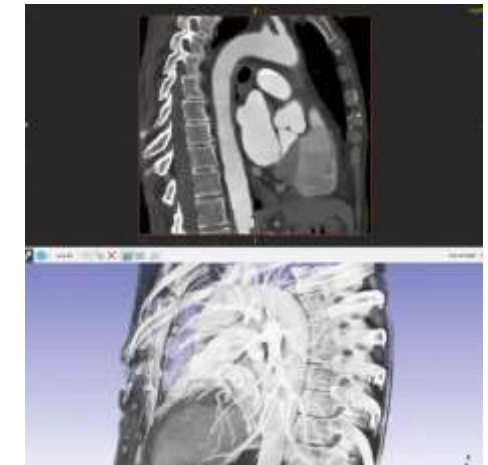


Arnaud Toutain
Healthcare Senior Manager EMEA



POC 3D Printing Workflow: Segmentation

How is it actually being done ?



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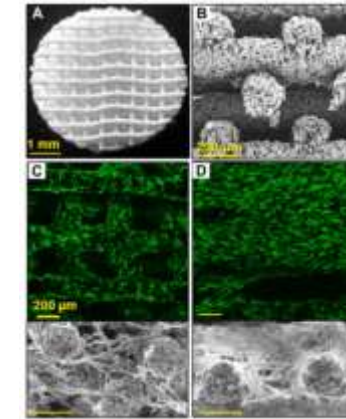
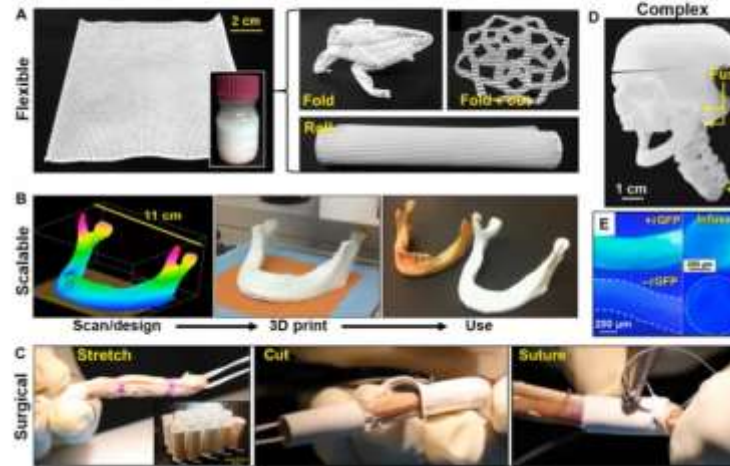
3D-BIOPLOTTER®

A 20 YEAR REVIEW: FROM BONE REGENERATION TO ORGAN PRINTING

Carlos Carvalho



Hyperelastic Bone



Carlos Carvalho– envisionTEC (Gladbeck, DE)



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Presentation of important companies in the field of 3D design and 3D printing



HIGH SPEED, LOW COST 3D METAL PRINTING

Materials (powders)

- Aluminium
- Copper
- Brass
- Steel
- Tungsten

Compressed heated air

- No use of inert gases
- Low cost
- Reduced OH&S risk

Robotic arm / part bed

- Robot 6 axis industrial robot
- Scalable for larger printers

Powder spray nozzle

- Rocket nozzle fires metal powder at supersonic speed
- Tied to the base of the machine



Stefan Ritt, Spee3D (Lubeck, DE)



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HP MultiJet Fusion – un salt în fabricarea digitala

Claudiu Birlogeanu
28 iulie 2021
claudiub@cadworks.ro



CADWORKS



Claudiu Birlogeanu (Craiova, RO)



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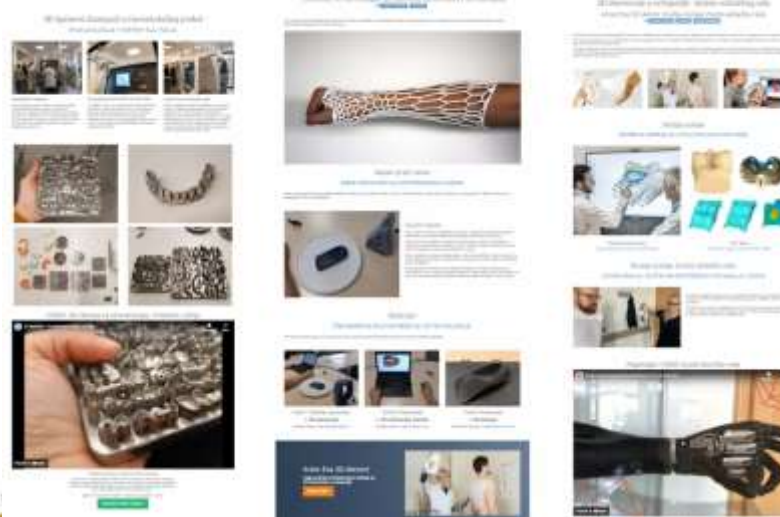
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BRIGHT International Summer School 2021

Affordable Professional 3D Solutions for Medical Applications

Miloš Momirović & Mladen Bogičević
Solfins 3D Company
Belgrade 2021



Milos Momirovic (Belgrade, SRB)



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Pre-operation aid

Remaining broke bone pieces are removed.
Standard titanium grid is shaped into the form of a bone to replace it.
Grid is mounted using titanium screws.
Thanks to the 3D printed model, grid could be shaped prior to operation.

OMNI3D



Photos: www.orthoprint.pl

Krzysztof Kardach, Omni3D (Poznan, PL)



BRIGHT International Summer School – TUCN – 19 -31.07.2021

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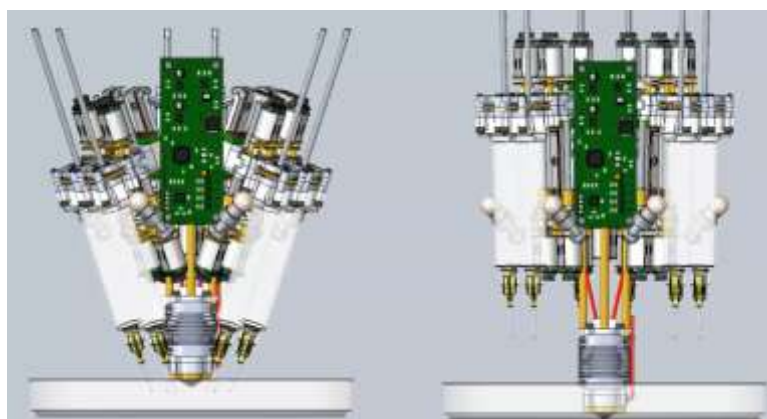
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- Eight independent CPUs**
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
8x Intel Atom E3800
- 7 inch touchscreen display**
7" Touchscreen display
7" Touchscreen display
7" Touchscreen display
7" Touchscreen display
7" Touchscreen display
7" Touchscreen display
7" Touchscreen display
- Multi-colored print heads**
Multi-colored print heads
Multi-colored print heads
Multi-colored print heads
Multi-colored print heads
Multi-colored print heads
Multi-colored print heads
Multi-colored print heads
- Integrated 300Watt 1000W**
Integrated 300Watt 1000W
Integrated 300Watt 1000W
Integrated 300Watt 1000W
Integrated 300Watt 1000W
Integrated 300Watt 1000W
Integrated 300Watt 1000W
Integrated 300Watt 1000W
- High resolution printing system**
High resolution printing system
High resolution printing system
High resolution printing system
High resolution printing system
High resolution printing system
High resolution printing system
High resolution printing system



Calin Brandabur – Symme 3D (Timisoara, RO)



Presentation of important companies in the field of 3D design and 3D printing

bizzcom

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Factory Digital Transformation

bizzcom
 MORE THAN TECHNOLOGY



Factory planning

Environment

- Features
 - Digitalize existing hall
 - Create specific on demand
 - Visualize complex environment
- Benefits
 - Change dimensions in digital
 - Adjustments
 - Visualize customer specifics



Branislav Rabara
 (BiZZCOM, SK)

Presentations on behalf of City Hall institution of Cluj-Napoca

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19 - 30 JULY 2021

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Mechatronics & Bio-Mechatronics Engineering
Science of Materials
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Oana Buzatu,
City Hall institution,
Cluj-Napoca, RO



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Presentations on behalf of Regional Development Agencies (RO)



**Lavinia Chiş, Department of INNO Platform
Development Agency of the North-West Region of Romania**

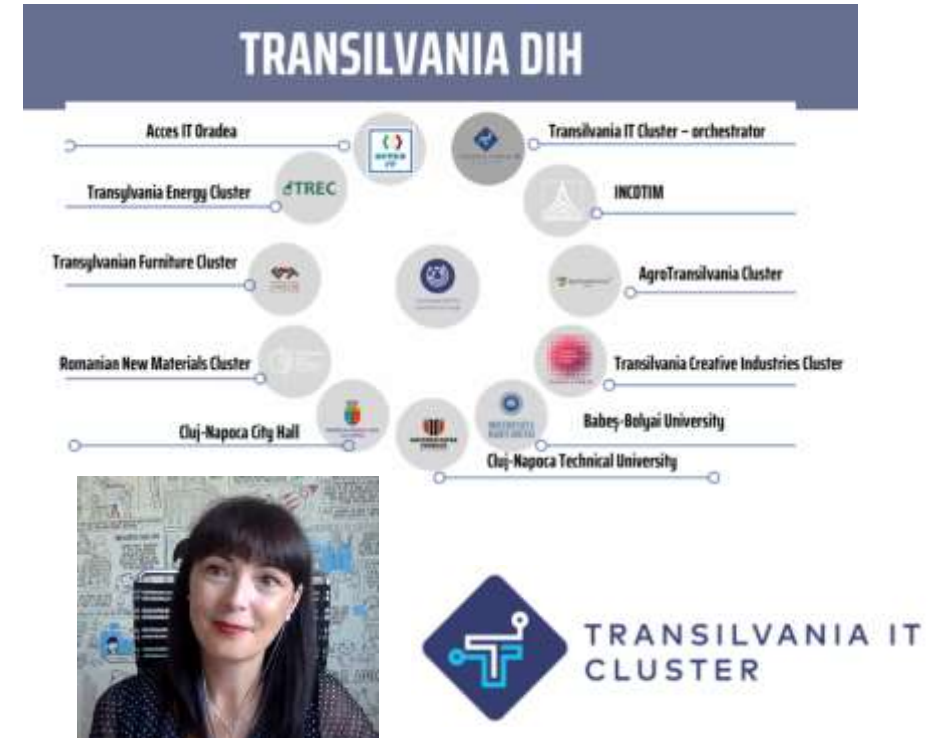
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Presentation on behalf of important local cluster

TRANSILVANIA IT CLUSTER

Bianca Muntean, PhD
Transilvania IT Cluster Manager
Transilvania Digital Innovation Hub Coordinator
EU Cluster Manager of the year 2019-2020

Cluster Management Excellence
EU CLUSTER MANAGER OF THE YEAR 2019

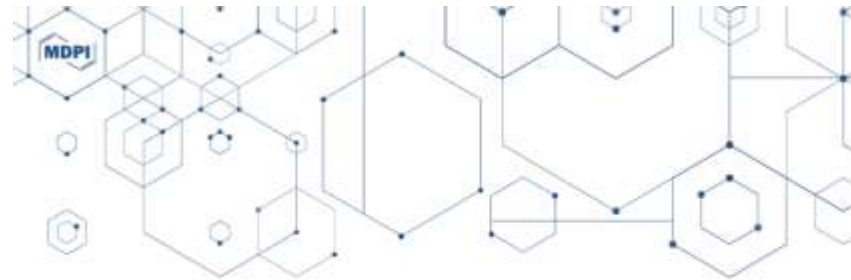


Bianca Muntean, Transilvania IT cluster, RO

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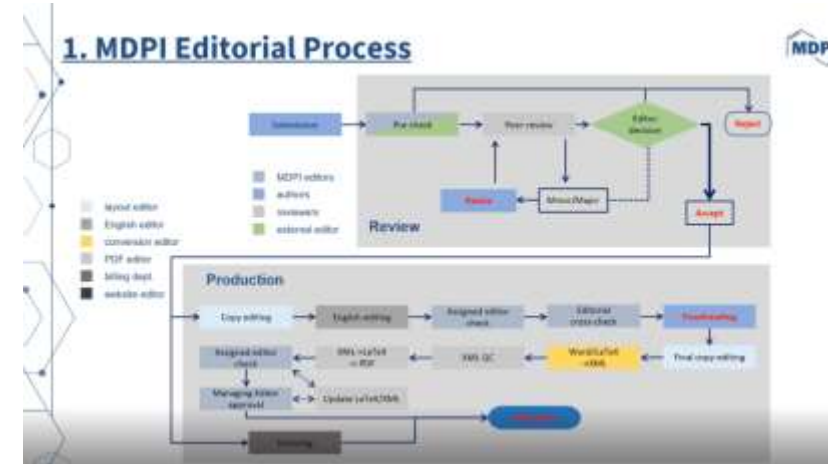
Presentation on behalf of International Publishing Houses about opportunities for disseminating of the results



MDPI Open Access Publishing Romania



<https://www.mdpi.com/journal/materials>



Ms. Irina Pelin and Ms. Anca Banu, MDPI, RO

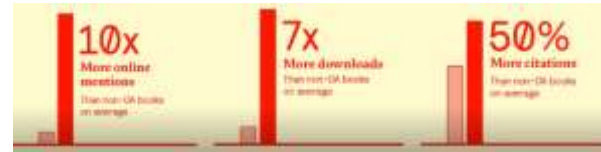
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Presentation on behalf of International Publishing Houses about opportunities for disseminating of the results

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Research funded by the FP7/2007-2013 (26417). Publishing of the book funded by the EC FP7. First Green OA Plus programme.

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Ms. Daniijela Duric, IntechOpen, UK

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One of the main practical challenge of BRIGTH summer school 2021 edition products to be re-designed by the students

PRODUCTS

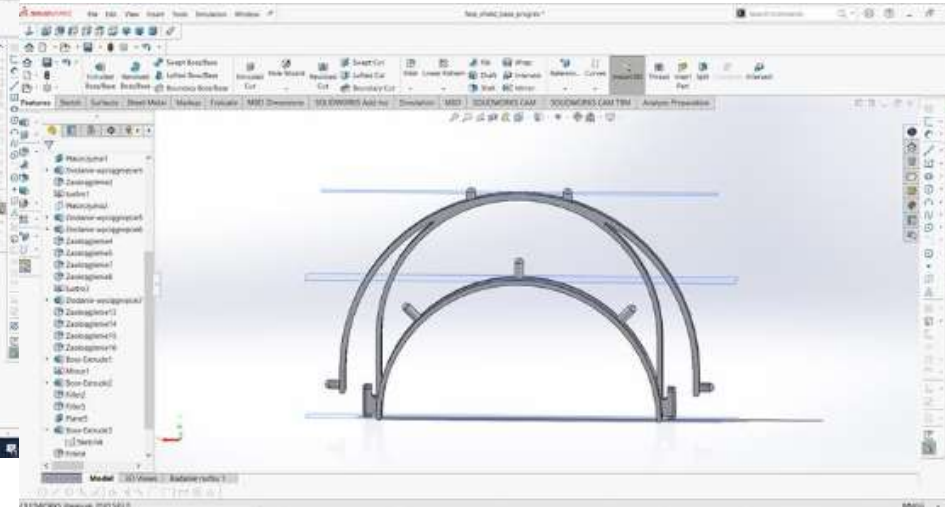
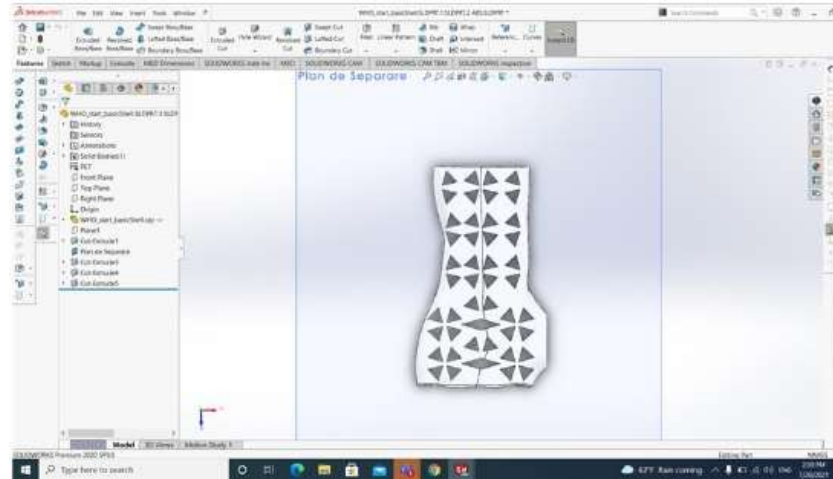
- 1) face shield
- 2) mechanical hand prosthesis
- 3) openwork wrist hand orthosis



Launching of products to be redesigned by the students - Prof. Filip Gorski, Univ of Poznan, PL

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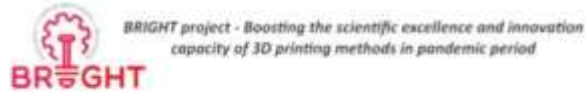
Working progress made by the students – CAD design



Designing of the products + Feedbacks from the CAD experts

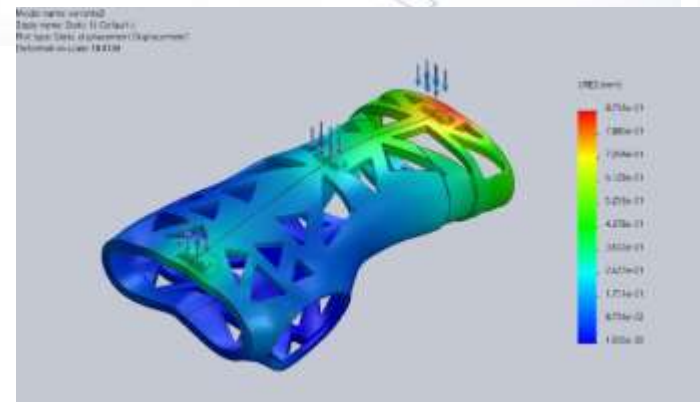
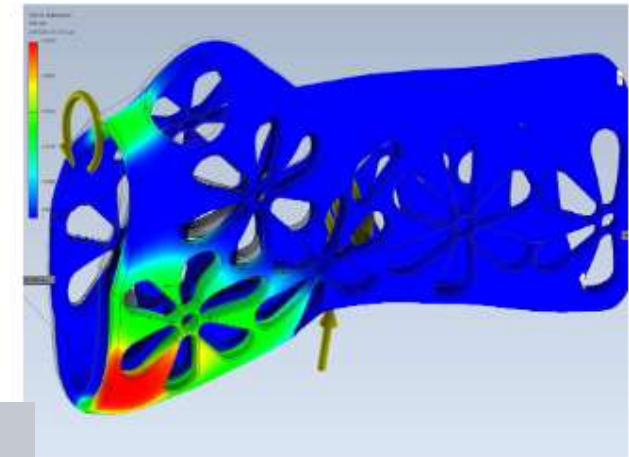
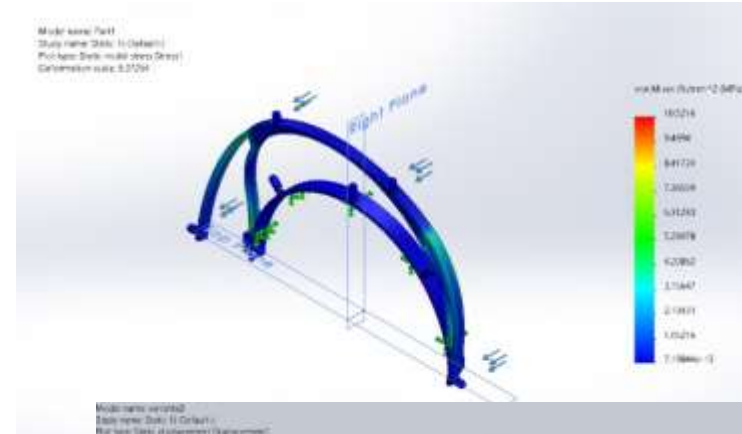
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Working progress made by the students – CAE design



Defining the types of 3D-printed samples to be tested - Seminar -

Dan-Sorin COMȘA, TU Cluj-Napoca, Romania
Tuesday, 20th July 2021, 15:00-16:00 EET



Feedbacks from CAE experts

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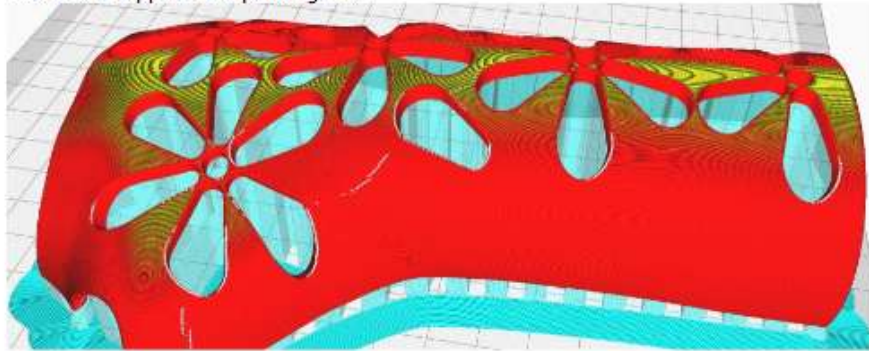


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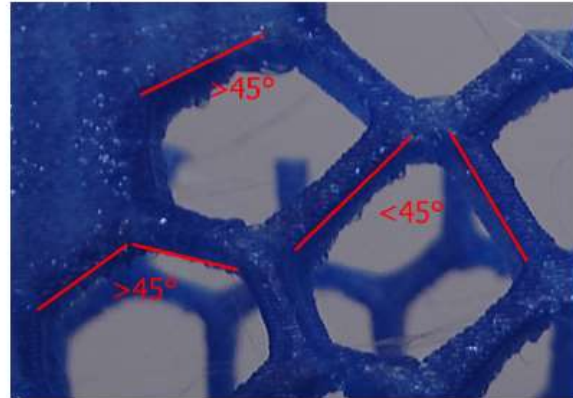
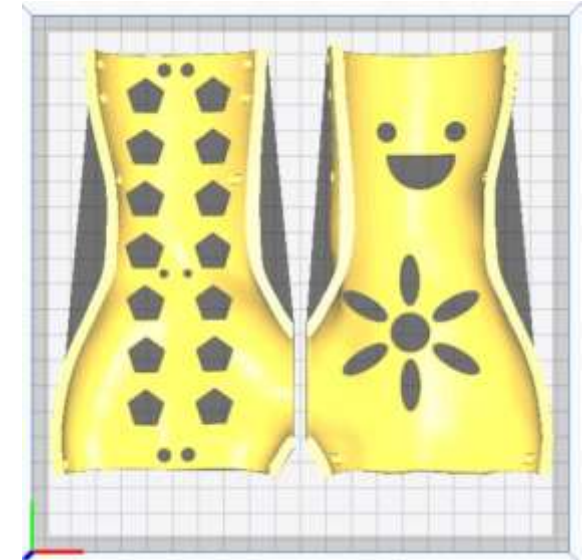


Working progress made by the students – 3D printing

Too much support and printing time.



Rounding the sharp corner!



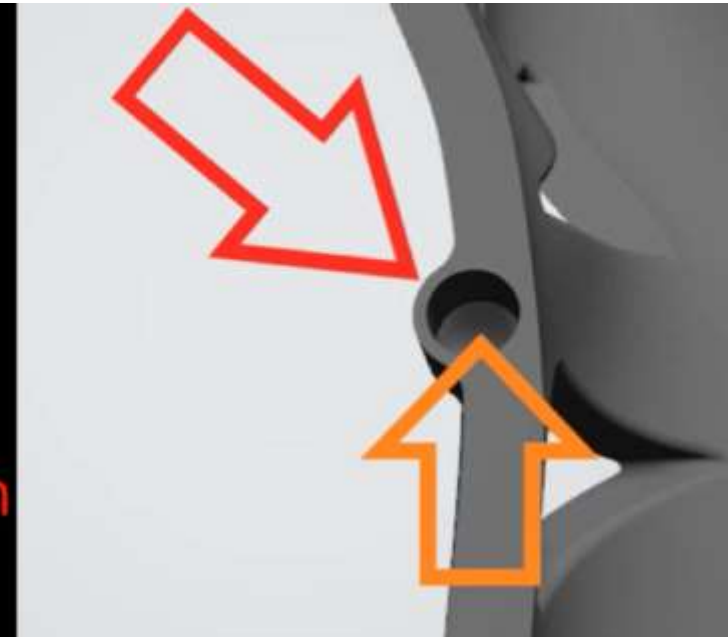
Feedbacks from 3D printing experts

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3D printing – results reached so far and issues to be solved



The alignment system is perfect
 BUT
 The wall is very thin



Feedbacks from 3D printing experts

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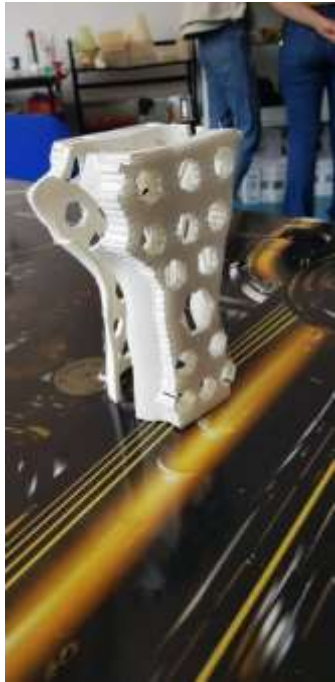
3D printing— results reached so far



Feedbacks from 3D printing experts

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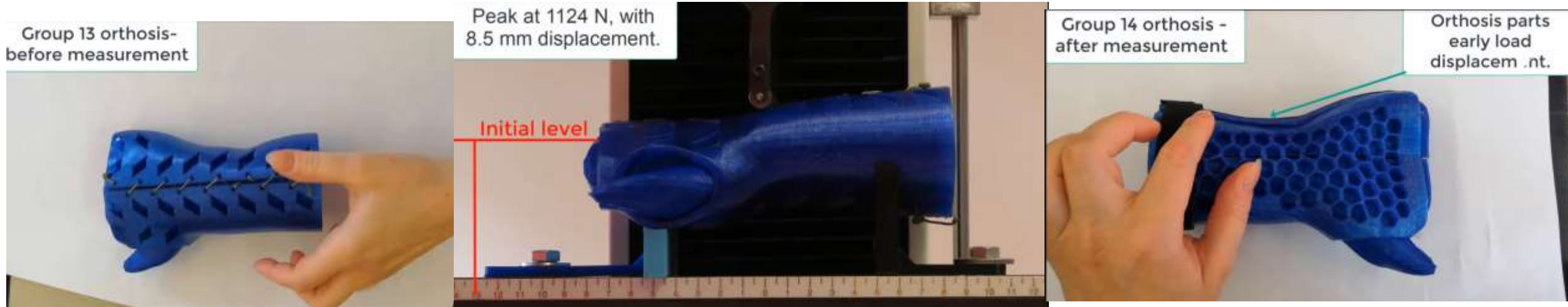
Final surprise of the ending of 1st week (TUCN, RO)



3D printing parts coming to life

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Working progress made by the students – Mechanical testing



Professional Feedback from Mechanical testing experts (Radoslaw Wichniarek, Sorin Comsa and Cristian Vilau)

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Final surprise of the ending of 1st week (TUCN, RO) – laboratory onsite visit



Students coming back to normal activities (onsite)

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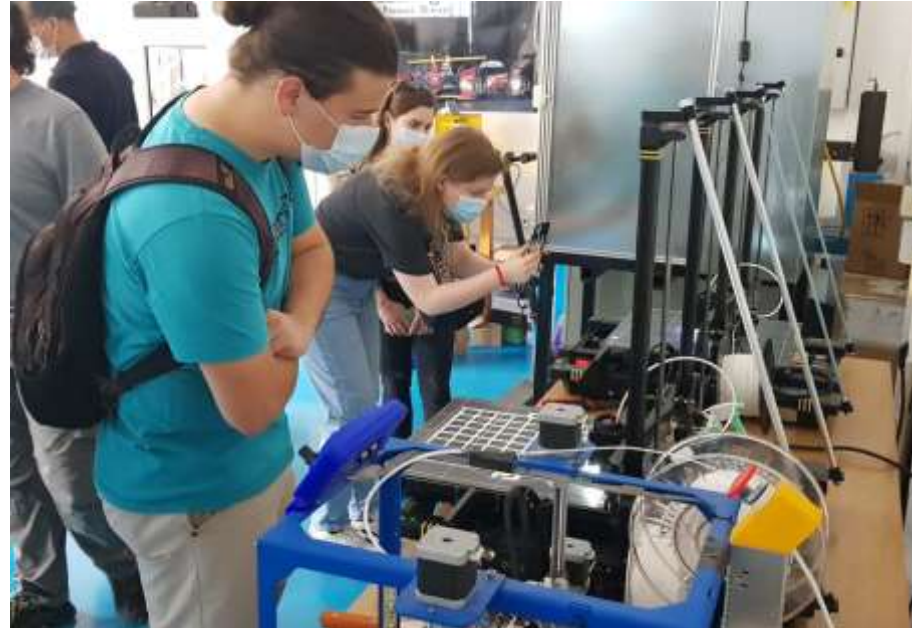
Final surprise of the ending of 1st week (TUCN, RO) – laboratory onsite visit



Students coming back to normal activities (onsite)

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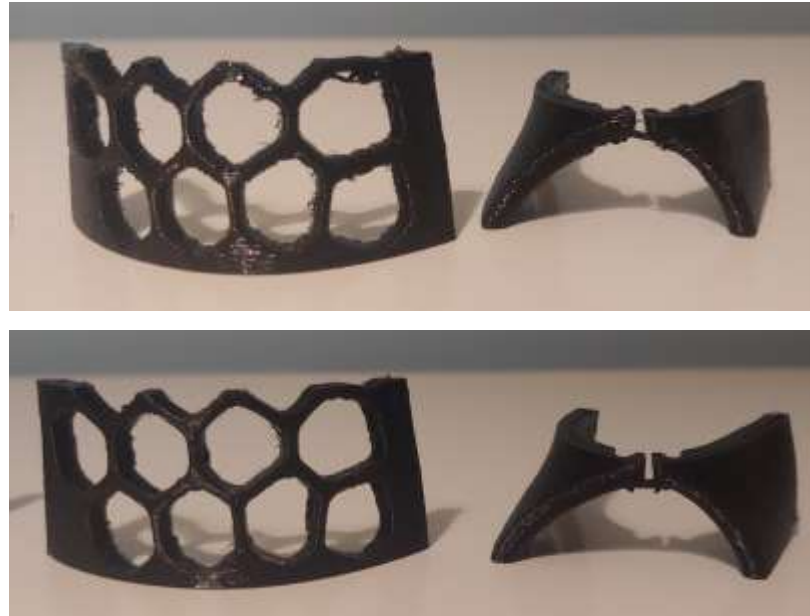
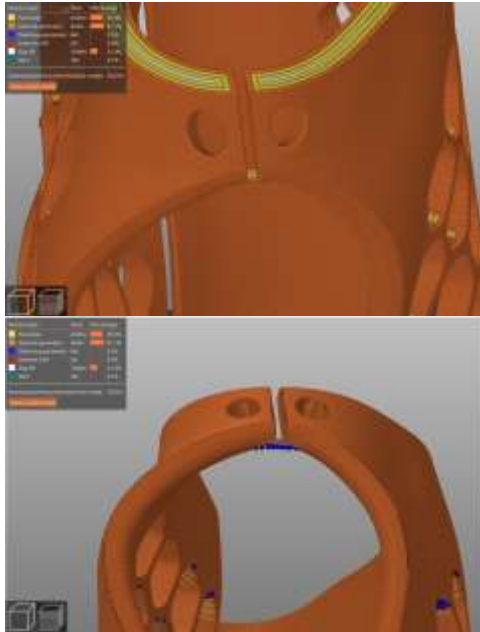
Final surprise of the ending of 1st week (TUCN, RO) – laboratory onsite visit



Students coming back to normal activities (onsite)

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Final Presentations made by the students



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Motivating messages at the end of the presentations made by students

Fantastic 4 members:



Let's keep going with development of 3D printing for medical application for a brighter future ;)

authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Motivating messages at the end of the presentations made by students

“Success is not final, failure is not fatal!” Thank you!



Group 5,
“Engineers of the Future”,
Romania



laurum Diana-Otilia
Ilie Raul-Emanuel
Nemanu Buzdea-lustina
Rapeanu Ioana-Viorica

Rotaru Igor
Tamas Paula-Irina
Vaida Ioana-Alexandra
Vasilachi Ionut
Jeno Tibor Albert

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Motivating messages at the end of the presentations made by students



Monica Rau



Vasile Portius



Ionut Peter



Robert Suflarszky



Pacnejer Andrei



Raluca Rus



Levente Orban



Mihai Pandrea



Ilinca Rus



Prof. Emilia Sabau

Innovate, so our future can be **BRIGHT-er!**

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Motivating messages at the end of the presentations made by students

CREATING LAYER BY LAYER



GROUP 10



Teodora Sburlea



Roxana Ioana Tudor




Andreea Maria Tomsea




Vlad Mihai Olar

ZentaMedical

Boglarka Willing



Tudor Cazacu



THE BEST IDEAS ARE ALWAYS BORN FROM TEAM-WORK!

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Motivating messages at the end of the presentations made by students



Design without borders

We all 3D print in the same language. You can do it do!!

Thank you!!



5G-eeks

Paper or Plastic?

Quattro



5G-eeks



Athanasia Papadopoulou



Anastasia Moschou



Matina Papageorgiou



Lazaros Firtikiadis



Iasonas Chrysostomos Vasileiou



Paper or Plastic?



Juraj Vivoda
Mateo Gregorovič
Anamarija Jurcan



Quattro



Viktorija Šiplova



Haralds Kārlis Sternbergs



Miks Biezbārdis



Oksana Stepanova

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Motivating messages at the end of the presentations made by students

Polishing design



Poltaters

Group no. 14



"Only the one who does not make mistakes is the one who does nothing."



Big thank you to BRIGTH team for a wonderful opportunity to work with experts!

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Motivating messages at the end of the presentations made by students

Cyber Makers from Ukraine

We thanks to all professors, organizers and companies.

It was really Bright Summer School

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Motivating messages at the end of the presentations made by students



Tetyana 



Bogdan 

Trio



Zinaida 



Cassiana 



Stefan 

Thank you for your attention!

Thank you for your support and your valuable feedback!

We had lots of fun and hope to see you next year!

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Feedbacks on behalf of students to presentations made by the BRIGTH students



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Hall of fame - BRIGTest star students of 2021 International Summer School edition



BRIGT Co-funded by the Erasmus+ Programme of the European Union

Hall of fame - BRIGTest star students of 2021 International Summer School edition

5G-eeks

- Matina Papageorgiou
- Athanasia Papadopoulou
- Anastasia Moschou
- Lazaros Firtikiadis
- Iasonas Chrysostomos Vasileiou

Quattro

- Oksana Stepanova
- Haralds Karlis Sternbergs
- Miks Biezbardis
- Viktorija Sipilova

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Pacurar, Technical University of Cluj-Napoca, STU, bizzcom, bm plast

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BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union

Award ceremony of BRIGHT International Summer School 2021 edition



BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union



Award Ceremony

Taking into account in particular the evaluation following criteria:

Complexeness of work

Quality of the presentation

Innovativeness



AWARD CEREMONY



Remigiusz ŁABUDZKI

POZNAN UNIVERSITY OF TECHNOLOGY

POLAND

Professors decided to distinguish 6 teams of students:

3D minds (Poland)

Engineers of the future (Romania)

Zenta Mendical (Romania)

Cyber makers (Ukraine + Slovakia)

Brainstormers (Serbia+Slovakia)

TRIO (Ukraine+Moldova+Romania)

and the **WINNER** is....

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Award ceremony of BRIGTH International Summer School 2021 edition



Award Ceremony

POLTATERS team members:



Award Ceremony

The prize is a 3D logo printed by Rapid Prototyping technique



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Announcements about the main aims of BRIGTH International Summer School 2021 edition!

VERY IMPORTANT TO KNOW!!!!

Certificates with ERASMUS + label were offered to the BRIGTH International summer school participants at the end to the ones that have fulfilled **the following conditions** :

1. the participants have attended to **minimum 75 %** of activities held at the BRIGTH Summer school (this includes lectures, presentations, labs, seminars, etc.);
2. the participants have defended **the final test**;
3. the participants have fulfilled **the final questionnaire**.

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BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union

Strong motivation for the next BRIGTH International Summer school – 2022 edition - in Croatia - to be remembered by all of you! Be sure that you will be there next year dear BRIGTH students! 😊

Most active students at BRIGTH summer school will be supported by the BRIGTH consortium to apply for ERASMUS scholarships for the BRIGTH International Summer School to be organized next year in Croatia (Brijuni Island) (July 2022) + they will have the chance to apply and work for their diploma projects in the field of 3D printing / VR/ AR / medical applications with the support and under supervision of BRIGTH partners consortium)!!!



BRIGTH International Summer School – TUCN – 19 -31.07.2021

Big thanks to all the participants to the BRIGTH International Summer School 2021 edition – Cluj-Napoca, Romania



BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



TECHNICAL UNIVERSITY OF CLUJ-NAPOCA ROMANIA

BRIGTH International Summer School on:

3D printing for medical applications



19 - 30 JULY 2021

WHO can apply
Bachelor students (BSc)
Master students (MSc)
PhD students

SPECIALIZATIONS:
Manufacturing Engineering
Mechatronics & Robotics
Mechanical & Bio-Mechanical Engineering
Science of Materials
Physics & Chemistry
Medicine & Pharmacy

More details

www.bright-project.eu

Registration until 1st of July 2021

Organized by
Technical University of Cluj-Napoca
In cooperation with



Co-funded by the Erasmus+ Programme of the European Union



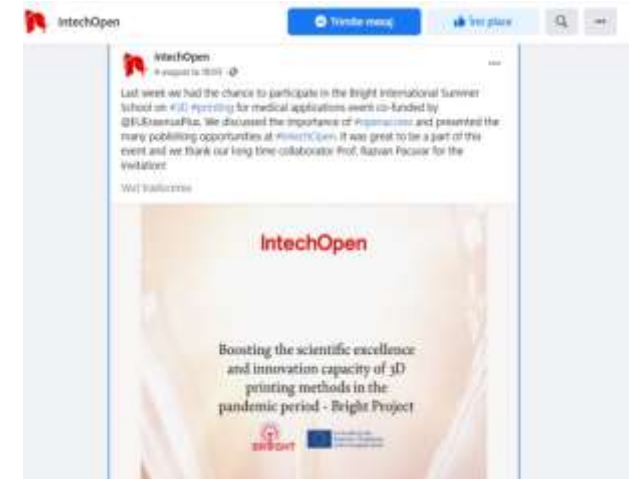
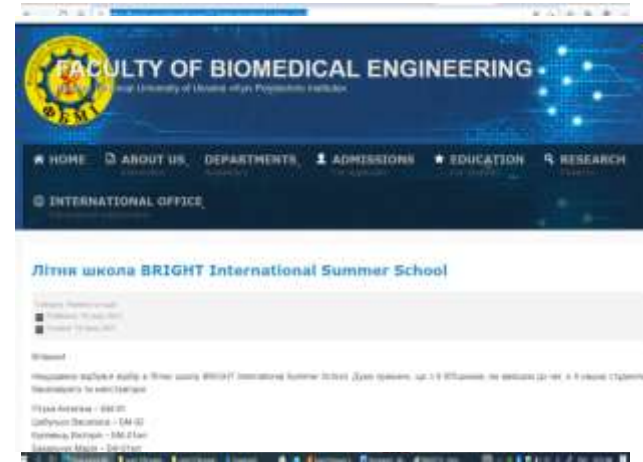


BRIGTH project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union

Positive national and international feedbacks related to the BRIGTH International Summer School 2021 edition



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Positive news in the local press related to the BRIGTH International Summer School 2021 edition

<https://www.vata-medical.ro/realitati/coala-de-vara-despre-imprimarea-3d-a-dispozitivelor-medicale-21868>

Universitatea Tehnică din Cluj-Napoca organizează în colaborare cu experții din consorțiul BRIGTH o școală de vară despre printarea 3D în domeniul medical.

Privit unui anunț publicat pe site-ul bright-project.eu, școala de vară este intitulată **BRIGTH** International Summer School, iar tema de anul acesta este „3D printing for medical applications”.



<https://eclujanu.ro/330-de-tineri-din-20-de-tari-au-venit-la-cluj-napoca-intr-un-program-erasmus-organizat-de-utc-n-umf-cluj/>

Home / Stiri locale / 330 de tineri din 20 de țări au venit la Cluj-Napoca într-un program ERASMUS, organizat de UTCN și UMF Cluj



STIRE LOCALE

330 de tineri din 20 de țări au venit la Cluj-Napoca într-un program ERASMUS, organizat de UTCN și UMF Cluj

2 luni ago • Clujeanul • No Comments



Școala Internațională de Vară în domeniul „împimării 3D cu aplicabilitate în domeniul medical”, din cadrul proiectului Internațional ERASMUS KA2 – BRIGTH debutează astăzi la Cluj-Napoca, iar 330 de tineri din 20 de țări au venit în oraș pentru acest program.



„Cu această ocazie, le-am transmis participanților următorul mesaj: tinerii sunt o sursă neputzabilă de creativitate, având capacitatea să își adapteze aptitudinile astfel încât să facă față cu brio oricărei provocări ale pieței muncii. Faptul că au ales să facă schimb de informații și de cunoștințe într-un astfel de proiect demonstrează că slujbele viitorului se vor baza

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BRIGHT – Transnational Project Meeting – 15 -16. 09.2021 – Nis, SRB



BRIGHT – Transnational Project Meeting – 15 -16. 09.2021 – Nis, SRB



BRIGHT – Multiplier Event – 17. 09.2021 – Nis, SRB



BRIGHT – Multiplier Event– 17.09.2021 – Nis, SRB



Setting updates, tasks and responsibilities for the next period – follow up after the Transnational Project Meeting and Multiplier event organized in Nis (September 2021)

IO2 - BRIGHT e-toolkit manual for digital learning in producing medical parts by 3D printing methods in the context of the pandemic (Assoc. Prof. [Răzvan Păcurar](#), **TUCN**, project manager)

Open access on the platform?	2 Modules	How to produce skull implants using Selective Laser Sintering + Vacuum casting technologies	TUCN, RO + University of Poznan, PL + University of Nis, SRB	Starting: 1.06.2021
		How to produce implants using Selective Laser Melting technologies		Template?
Report?	1 Module	Stereolithography (Digital Light processing method)	University of Nis, SRB + Univ Juraj Dobrila , HU	Content?
	1 Module	Fused Filament Fabrication method or alternative	Univ. of Poznan, PL + Univ Juraj Dobrila , HU	
	1 Module	Fused Deposition Modeling (Reprap technologies)	Univ. of Poznan, PL + B. M. Plast d.o.o. , HR	
	1 Module	Rapid Tooling methods	STU Bratislava, SK + BIZZCOM s.r.o.	Deadline: 30.11.2021
	3D printing of parts		B. M. Plast d.o.o. , HR	
		BIZZCOM s.r.o. , SK		

The partners of the BRIGHT consortium are expected to provide similar toolkits in relation with the medical sector/3D printing by engaging other types of 3D printing that are available and can be used in the medical sector in a similar way.

For each module according to the skills and competences of the BRIGHT 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.

Setting updates, tasks and responsibilities for the next period – follow up after the Transnational Project Meeting and Multiplier event organized in Nis (September 2021)

1. applying for future common projects in the frame of ERASMUS, HORIZON programs, other research projects, etc. (all partners)
2. signing of ERASMUS bilateral agreements / CEEPUS (all partners)
3. Running common BSc./ MSc. Diploma projects, etc.) (all partners)
4. Starting of planning and organizing of TPM / LTT / ME for the next year

Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)



BRIGHT

Erasmus+ strategic partnership for Higher Education
 BOOSTING THE SCIENTIFIC EXCELLENCE AND INNOVATION
 CAPACITY OF 3D PRINTING METHODS IN PANDEMIC PERIOD

MODULE 1 CAD

Project Title	Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period 2020-1-RO01-KA226-HE-095517
Output	IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period
Module	Module 1 CAD
Date of Delivery	July 2021
Authors	Filip GÖRSKI Radomir WICHNIAREK Sven SEARČIČ Nikola VITKOVIČIĆ
Version	V1.2, 3.06.2021



BRIGHT

Erasmus+ strategic partnership for Higher Education
 BOOSTING THE SCIENTIFIC EXCELLENCE AND INNOVATION
 CAPACITY OF 3D PRINTING METHODS IN PANDEMIC PERIOD

MODULE 2 CAE

Project Title	Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period 2020-1-RO01-KA226-HE-095517
Output	IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period
Module	Module 2 CAE
Date of Delivery	July 2021
Authors	Associate prof.dr.eng. Răzvan Păcurar, Associate prof.dr.eng.Nikola Korunovic, Lecturer dr.eng. Cristina Borzan, Lecturer dr.eng. Horea Chezan, Lecturer dr.eng. Vilău Crișian
Version	V1, 31.07.2021



BRIGHT

Erasmus+ strategic partnership for Higher Education
 BOOSTING THE SCIENTIFIC EXCELLENCE AND INNOVATION
 CAPACITY OF 3D PRINTING METHODS IN PANDEMIC PERIOD

MODULE 3 Material Science & Strength of Materials

Project Title	Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period 2020-1-RO01-KA226-HE-095517
Output	IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period
Module	Module 3 Material Science & Strength of Materials
Date of Delivery	July 2021
Authors	Renata LABUZKI Radomir WICHNIAREK Filip SARBNOVSKI Sven MARIČIČ
Version	FINAL VARIANT, 20.07.2021



BRIGHT

Erasmus+ strategic partnership for Higher Education
 BOOSTING THE SCIENTIFIC EXCELLENCE AND INNOVATION
 CAPACITY OF 3D PRINTING METHODS IN PANDEMIC PERIOD

MODULE 4 Flexible manufacturing systems

Project Title	Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period 2020-1-RO01-KA226-HE-095517
Output	IO1 - BRIGHT e-learning support courses for curriculum aiming to boost the scientific excellence and innovation of 3D printing methods used for developing and producing medical parts in pandemic period
Module	Module 4 Flexible manufacturing systems
Date of Delivery	August 2021
Authors	Peter Kralj, Vanesa Prizeta, Miriam Matelová, Erica Hroščová, Andrea Modriková
Version	V0, final 02.8.2021



BRIGHT

Erasmus+ strategic partnership for Higher Education
 BOOSTING THE SCIENTIFIC EXCELLENCE AND INNOVATION
 CAPACITY OF 3D PRINTING METHODS IN PANDEMIC PERIOD

MODULE 5 3D PRINTING

Project Title	Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period 2020-1-RO01-KA226-HE-095517
Output	IO1 - Mapping and scientific literature review on the stakeholders' skills for Industry 4.0
Module	Module 5 3D Printing
Date of Delivery	July 2021
Authors	Associate prof.dr.eng. Răzvan Păcurar, Associate Prof.dr.eng. Nikola Tržabek, Associate prof.dr.eng. Aleksandar Milićević
Version	Final variant, 18.07.2021



Course modules prepared by the consortium within IO1 ready to be published as "open book"



Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)



Open Access Article

Thin Films Deposition of Ta₂O₅ and ZnO by E-Gun Technology on Co-Cr Alloy Manufactured by Direct Metal Laser Sintering

by Diana-Irinel Baltă^{1*}, Cătălin Vitelaru², Roxana Truşcă¹, Lidia Roxandra Constanta², Ancuța Păcurar³, Constantin Anca Parasu² and Răzvan Păcurar^{3*}

- Department of Manufacturing Engineering, Faculty of Industrial Engineering and Robotics, Polytechnic University of Bucharest, Splaiul Independenței nr. 313, Sector 6, 060042 Bucharest, Romania
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Open Access Article

Selective Laser Melting of PA 2200 for Hip Implant Applications: Finite Element Analysis, Process Optimization, and Morphological and Mechanical Characterization

by Răzvan Păcurar^{1*}, Petru Băncu¹, Anica Petrică¹, Ovidiu Nemeş², Cristina Ștefăna Mihai Dorcan³, Mona Harmitarova^{3,4} and Ancuța Păcurar^{1*}

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Open Access Article

Cast Iron Parts Obtained in Ceramic Molds Produced by Binder Jetting 3D Printing—Morphological and Mechanical Characterization

by Răzvan Păcurar^{1*}, Petru Băncu¹, Ovidiu Nemeş^{2*}, Diana-Irinel Baltă¹, Dan Bărgău Stan⁴, Alexandru Onușca⁴, Florin Popșter⁵, Cristina Mihai Dorcan¹, Sven Martić⁶, Stanisław Legutko⁷ and Ancuța Păcurar¹

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Open Access Article

Mathematical Approach in Complex Surfaces Toolpaths

by Florin Popșter^{1*}, Daniela Popescu¹, Ancuța Păcurar² and Răzvan Păcurar^{2*}

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Publications in ISI journals (Q1) – 4 publications in 2021



Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)

The screenshot shows a grants portal with the following content:

- Open calls:**
 - Name:** Preparatory Visits Application Form
Program: ESAYEP - Preparatory Visits
Deadline for submission: 30 Dec 2022 22:00
For a preparatory visit please click here to apply
 - Name:** Mobility Projects 2021 - Application Form
Program: ESAYEP - 2021 Mobility Projects in Higher Education
Deadline for submission: 25 Oct 2021 13:00
For mobility projects please click here to apply
 - Name:** Cooperation Projects in The Higher Education Area 2021 Application Form
Program: ESAYEP - 2021 Cooperation Projects in Higher Education Area
Deadline for submission: 25 Oct 2021 13:00
For cooperation projects please click here to apply
- Applications:**
 - 21-COP-0019 European network for 3D printing of biomimetic mechatronic systems Draft



European network for 3D printing of biomimetic mechatronic systems
===== EMERALD =====

New project proposal – interdisciplinary – involving 3D printing / bio-mechatronics / materials science / computer programming
Augmented / Virtual reality / medical engineering - Iceland, Liechtenstein, Norway grants (EEA)

Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)



MANUFACTURING
www.manufacturing.put.poznan.pl
www.facebook.com/manufacturing2022
manufacturing@put.poznan.pl

Special Session SS_15 Design and rapid manufacturing of customized medical products

Brief description of the specific scientific scope of the Special Session:
Medicine and biomedical engineering are today among the most vital applications of computer aided design and 3D printing (additive manufacturing). Both doctors and patients, as well as scientists can benefit from recent advancements in this technology and its increasing availability at acceptable cost. Customized medical products, both for doctors and patients, become a standard and their design and production processes must be studied, optimized and improved in order to obtain tangible progress. Therefore, this Special Session is dedicated to research and review papers tackling the problems of computer aided design and rapid manufacturing in medical and biomedical engineering applications, especially for customized implants, orthopaedic and prosthetic devices, other artificial organs and new methods of treatment, utilizing devices designed and manufactured individually for a specific patient.

- List of topics of interest:**
1. CAD design of anatomical models,
 2. Processing of medical imaging data for development of customized, anatomically adjusted products,
 3. 3D scanning and reverse engineering techniques in medicine and biomedical engineering,
 4. Mass customization in medicine, design automation,
 5. Selection and improvement of materials for 3D printed medical products,
 6. Optimization of 3D printing processes of customized medical products,
 7. XR techniques (Virtual and Augmented Reality) in design of medical products,
 8. Numerical simulation of 3D-printed structures used in medicine,
 9. Destructive and non-destructive testing of 3D printed individualized medical products.

Members of the Special Session Organizing Committee:

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Manufacturing 2022
ISI conference

Management and Production Engineering Review
MPEER, Management and Production Engineering Review (PL) 19 (2021)
ISSN 2282-1244

BULLETIN OF THE POLISH ACADEMY OF SCIENCES
BIPAP, Bulletin of the Polish Academy of Sciences: Technical Sciences, Special Issue: Sustainability in Production in the aspect of Industry 4.0 (2021-1248, PL, 100 pages)
ISSN 2098-1917

materials
MPEER, Materials, Special Issue: 3D Printing in Medicine and Biomedical Engineering (2021, 3,32, PL, 140 pages)
ISSN 2079-9855

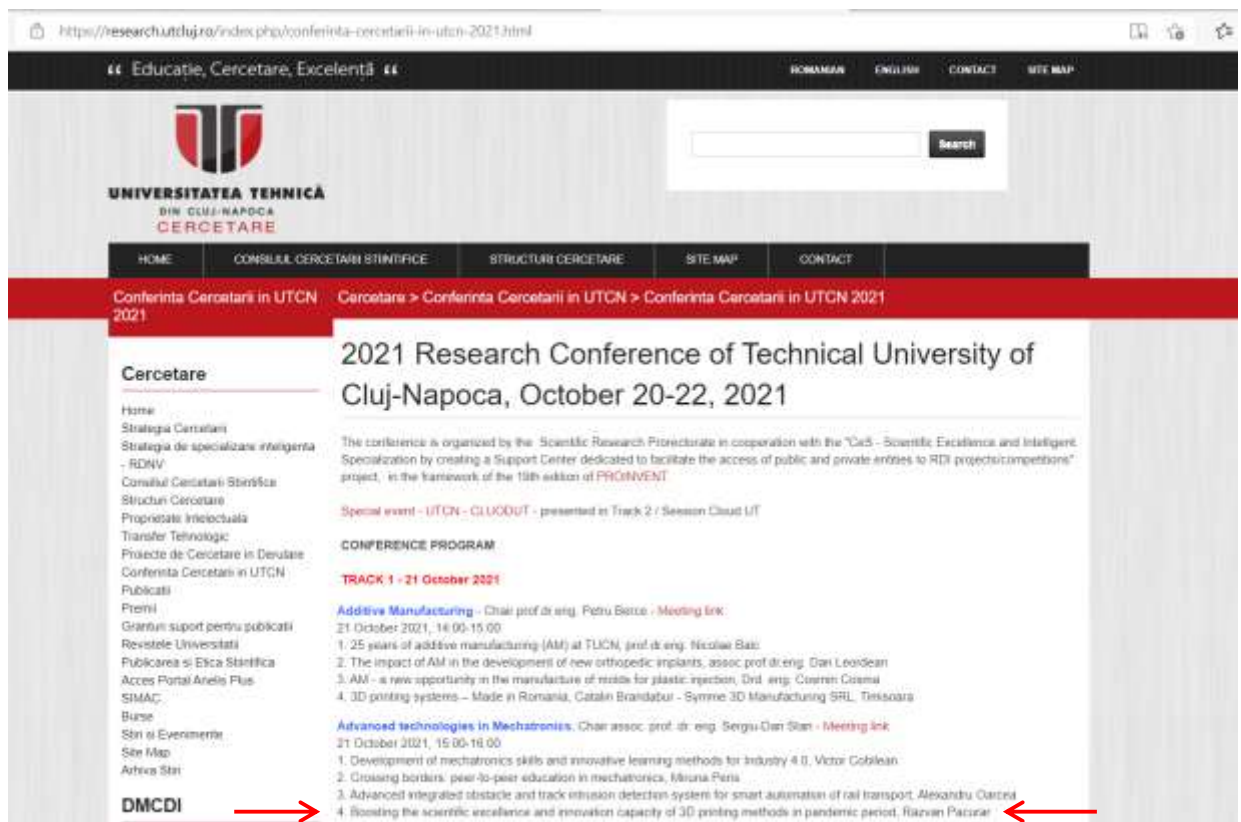
applied sciences
MPEER, Applied Sciences, Special Issue: Smart Manufacturing Systems in Industry 4.0 (2021, 12,168, PL, 70 pages)
ISSN 2076-3417

Submission Deadline: 31.10.2021

Springer Publishing House



Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)



Presentation held at the 2021 Research Conference of Technical University of Cluj-Napoca - 21st of October 2021



Tasks already fulfilled after the TPM and ME organized in Nis (October 2021)



INNOVATIVE MANUFACTURING ENGINEERING & ENERGY INTERNATIONAL CONFERENCE

2021 IManEE

1.0 2.0 3.0 4.0

21-23 OCTOBER 2021

ONLINE EDITION

Friday, 22 October 2021

Plenary Speakers
Live session

9:00 – 9:30 *"Status and development trends of laser processing technology"*

- PhD. Miloš Madić, Faculty of Mechanical Engineering in Niš, University of Niš, Serbia

9:30 – 10:00 *"Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period"*

- PhD. Răzvan Păcurar, Technical University of Cluj-Napoca, Faculty of Machine Manufacturing, Cluj-Napoca, Romania

10:00 – 10:30 *"Stakeholder analysis for the development of LNG bunkering facilities"*

- PhD. Evangelos Bellos, National Technical University of Athens, School of Mechanical Engineering, Greece
- PhD. George Chatzistelios, National Technical University of Athens, School of Mechanical Engineering, Greece
- PhD. Angeliki Deligianni, National Technical University of Athens, School of Mechanical Engineering, Greece
- PhD. Konstantinos Kirytopoulos, National Technical University of Athens, School of Mechanical Engineering, Greece

<https://meet.google.com/fao-bbx-e-fsu>

www.imane.ro

Host: Andrei MIHALACHE

Plenary speaker invitation at the International IManEE 2021 scientific conference in Iasi – www.imane.ro



BSc /MSc/PhD thesis directions organized in mentorate / co-mentorate variant established (still opened to be completed)

1. Automation of the design of the openwork for the WHO orthosis in the selected CAD system.
2. Virtual prosthesis configurator of the Robohand type.
3. Prototyping of a child upper-limb prosthesis for cycling.
4. Prototyping of a device for measuring the strength of the adductors of the hand stump.
5. Optimization of the FFF process from the point of view of the production of orthoses.

This project has been funded with support from the European Commission. This publication [communication] reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union



BSc /MSc/PhD thesis directions organized in mentorate / co-mentorate variant established (still opened to be completed)

6. Designing and realizing of bone structures (lattice structures) by 3D printing (shin, knee, hip, etc.)
7. Designing and manufacturing of customized medical implants by 3D printing methods (metallic implants / structures made of Titanium alloys, Co-Cr, etc.) – hip implants, dental implants, etc.
8. Manufacturing of skull implants / vertebral implants made of PEEK material by 3D printing
9. Manufacturing of medical stents /bye-pass systems made of biocompatible materials by SLA
10. Manufacturing of medical orthoses – hand orthoses, foot orthoses, pelvic orthoses) by 3D printing

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BSc /MSc/PhD thesis directions organized in mentorate / co-mentorate variant established (still opened to be completed)



11. Manufacturing of biomimetic robotic hands / neuro-skeletons / artificial hands for people with special needs (amputated arms, fingers, etc) by 3D printing methods
12. Manufacturing of medical devices for fixing the patients during different surgical operations (by 3D printing methods)
13. Manufacturing of 3D printing / hybrid equipment items that combines 3D printing methods with CNC equipment / mechatronic / robotic systems destined for testing new types of materials
14. Virtual Reality / Augmented Reality / mixed reality applications for medical domain)
15. Manufacturing of tissues, vessels, human organs, biocompatible structures using 3D bioprinting

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Quick overview of the Intellectual outputs related to the BRIGHT project

IO3 - BRIGHT e-learning virtual laboratory platform for boosting the scientific capacity and innovation in teaching processes related to medical parts made by 3D printing methods in pandemic period

(Assoc. prof. MSc. Eng. Peter Košťál, STU Bratislava)

Virtual laboratory with 3 rooms:

Starting:
1.12.2021

Open access on the platform?

VR / AR methods?

Content?

Report?

Deadline:
31.07.2022

Virtual laboratory environment / including of Virtual reality elements in the platform	STU Bratislava
1 room for CAD / CAE programming - preparing the e-library with medical models	TUCN, RO & Univ of Juraj Dobrila, HR
1 room for 3D Printing Processes and Preparation	Univ. of Poznan, PL
1 room of Testing and control	University of Nis, SRB
The real printing of the prepared parts	B. M. Plast d.o.o.,HR & BIZZCOM s.r.o., SK
The testing procedures	all partners

For each room according to the skills and competences of the BRIGHT 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.

Challenge and strong motivation for students 😊

Most active students at BRIGHT summer school will be supported by the BRIGHT consortium to apply for ERASMUS scholarships for the BRIGHT International Summer School to be organized next year in Croatia (Brijuni Island) (July 2022) + they will have the chance to apply and work for their diploma projects in the field of 3D printing / VR/ AR / medical applications with the support and under supervision of BRIGHT partners consortium)!!!



Challenge and strong motivation for students 😊



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

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Acknowledgments

BRIGHT professors from the Board of the University, the Faculty and Department of Manufacturing Engineering (Technical University of Cluj-Napoca, RO)



Rector, prof.dr.eng. Vasile TOPA



Vice rector with International relations, prof. dr.eng. Dan Mandru



Dean of the Faculty of Industrial Engineering, Robotics and Production Management, prof.dr.eng. Corina Birleanu



Head of Department of Manufacturing Engineering, assoc. prof.dr.eng. Adrian Trif



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Acknowledgments

**Technical assistance for the entire
summer school & realizing / updating of BRIGTH web page:
Alexandru Ianosi, TUCN, RO**



BRIGTH concept logo

Lea Grguric, Delnice, HR



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BRIGTH responsible of the groups

Cristina Borzan – assistant chief manager - TUCN, RO



Ancuta Pacurar, TUCN, RO
 Sergiu Dan Stan, TUCN, RO
 Catalin Moldovan , TUCN, RO
 Alexandru Ianosi, TUCN, RO
 Alexandru Oarcea, TUCN, RO
 Victor Cobilean, TUCN, RO
 Mihai Ciupan, TUCN, RO
 Alin Plesa, TUCN, RO
 Vilau Cristian, TUCN, RO
 Emilia Sabau, TUCN, RO



Trifan Vlad, TUCN, RO
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 Miriam Matusova, STU, SK
 Martin Necpal, STU, SK
 Magdalena Zukowska, Poznan, PL
 Krzysztof Lukaszewski, Poznan, PL
 Ivan Veljovic, Istria, HR
 Matea Grdic, Istria, HR

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BRIGHT professors that have delivered presentations related to summer school topic

Prof. Petru Berce, TUCN, RO
Prof Nicolae Balc, TUCN, RO
Prof. Cristian Dudescu, TUCN, RO
Prof. Popa Catalin, TUCN, RO
Prof. Doina Pisla, TUCN, RO
Associate prof. Sorin Comsa, TUCN, RO
Associate prof. Dan Sergiu Stan, TUCN, RO
Lecturer Stefan Bodi, TUCN, RO
Lecturer Alin Plesa, TUCN, RO
Lecturer Florin Popister, TUCN, RO



Researcher Alexandru Oarcea, TUCN, RO
Researcher Victor Coblinean, TUCN, RO
Prof.dr. Horatiu Rotaru, Univ of Medicine, Cluj, RO
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Prof. Radoslaw Wichniarek, Univ. of Poznan, PL
Msc. Eng. Filip Sarbinovski, Univ. of Poznan, PL
Msc. Eng. Maria Ratajczak, Univ. of Poznan, PL
Prof. Nikola Korunovic, Univ of Nis, SRB
Prof. Panagiotis Kyriakis, Univ of W. Macedonia, GR
Prof. Miroslav Trajanovic, Univ. of Nis, SRB
Prof. Milos Manic, Virginia Commonwealth University, USA

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Representatives on behalf of the companies that have made presentations at this edition of BRIGHT International Summer School (2021)



Diana Skopina (Materialise)

Carlos Carvalho (envisionTEC)

Cristian Foral (NU Technologies)

Robin Bappert (SLM Solutions)

Milos Momirovic (Solfins)

Claudiu Birlogeanu (CAD Works)

Stefan Ritt (Spee3D)

Bransilav Rabara (Bizzcom)

Ciprian Onetiu (3DDesign)

Stefan Kapp (3D Systems)

Krzysztof Kardach (Omni 3D)

Narcis Barbarii (PRO-4DFORM)

Arnaud Totain (Stratasys)

Calin Brandabur (Symme 3D)

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Representatives on behalf of the City hall institution, SMEs, R & D sector

City hall representatives (Cluj-Napoca)

Mayor of Cluj-Napoca city, Emil Boc

Emilia Botezan

Oana Buzatu



SMEs representatives, clusters and Developing Agencies

Cristian Otgon (North West Developing Agency, RO)

Lavinia Chis (North West Developing Agency, RO)

Bianca Muntean (Transilvania IT cluster)

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Representatives of disseminating Publishing Houses

MDPI Romania

HR Manager Irina Pelin

Ms. Anca Banu



IntechOpen, UK

Head of Publishing operations, Danijela Duric

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Ms. Milica Mataja-Mafrici

Ms. Milica Aberer



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BRIGHT project - Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period



Co-funded by the Erasmus+ Programme of the European Union

BRIGHT consortium partners (coordinators)



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Prof.dr.eng. Milos Simonovic, University of Nis, SRB



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Prof.dr.eng. Peter Kostal, STU, Bratislava, SK



Prof.dr.eng. Sven Maricic, Juraj Dobrila University, Istria, HR

thank you



Bransilav Rabara, BIZZCOM s.r.o., Bučany, SK



Mate & Senka Babic, B. M. Plast d.o.o, Optajia, HR

thank you



BRIGHT ERASMUS KA 226 project – Follow up / contact



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Facebook, Instagram: <https://www.facebook.com/bright3Dprinting>

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