



POZNAN UNIVERSITY OF TECHNOLOGY



Faculty of Mechanical Engineering Institutes

Applied Mechanics

Mechanical Technology

Faculty of Mechanical
Engineering

Materials Technology

Machine Design



research workstation with hydraulic and pneumatic systems



image recording and analysis station equipped with a fast Cronos 1.4 camera and a lighting system



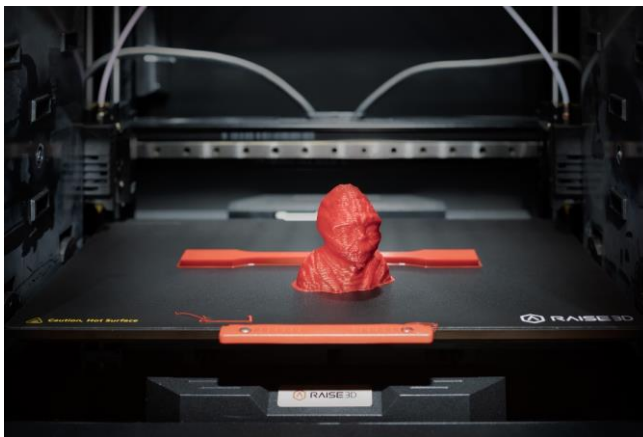
Laboratory of
Strength of Materials and Structures

Laboratory of
Vibration & Machine Dynamics

Institute of Applied Mechanics



3D Cube Pro



XYZprinting da Vinci
1.0 Pro

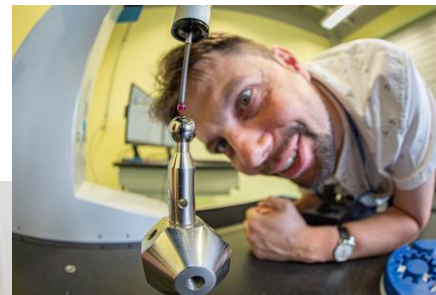
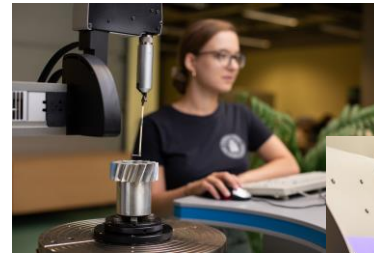
Nobel 1.0 Advanced SLA



Laboratory of Rapid Prototyping



Machining Laboratory



Laboratory of Coordinate Metrology



Specialized software for programming and simulating the work of robotic stations in offline mode:

- RobotStudio,
- RoboGuide,
- DTPS-G2PCTool,

enable programming of manipulation and technological robots, e.g. welding and designing robotic stations and simulating their work in a virtual environment.

	ABB	ABB	FANUC	PANASONIC
type	IRB 140T	FlexPicker 360	M16iB-10L	TA-1400
degrees of freedom	6	3/4	6	6
lifting capacity [kg]	6	1/3	10	6
robot repeatability [mm]	0,03	0,1	0,1	0,1
robot mass [kg]	98	120	230	161
control system	IRC5	IRC	R30iA	G2



Foundry Laboratory



Plastics Laboratory





Smart Factory Laboratory



VR & AR Laboratory

Rapid Prototyping Laboratory





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

KICKOFF MEETING – CLUJ NAPOCA – 28.02.2022



Filip GÓRSKI, DSc, PhD, BEng
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POZNAN UNIVERSITY OF TECHNOLOGY

EMERALD TEAM

Team leader:

**Filip GÓRSKI, DSc, PhD, BEng,
Associate Professor, VR & 3D printing head**

Team members:

Remigiusz ŁABUDZKI, PhD, BEng

Radosław WICHNIAREK, PhD, BEng

Dominik RYBARCZYK, PhD, BEng

Roman REGULSKI, MSc, BEng

Magdalena ŻUKOWSKA, MSc, BEng

Justyna RYBARCZYK, MSc, BEng

**Faculty of Mechanical Engineering
Institute of Materials Technology
Institute of Mechanical Technology**

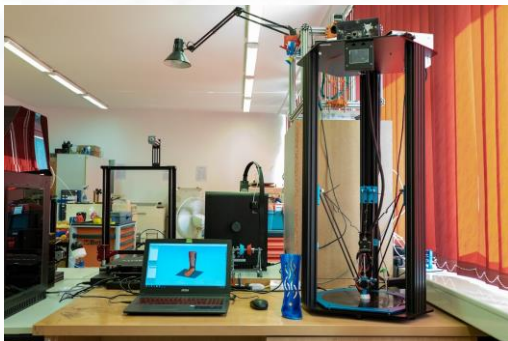


POZNAN UNIVERSITY OF TECHNOLOGY

EMERALD TEAM

Team skills:

- CAD/CAM/CAE, design automation,
- medical data processing,
- anatomical & medical design (prostheses, orthoses, implants...)
- 3d scanning, reverse engineering, mesh processing,
- 3d printing in FDM and SLA, Vacuum Casting,
- robot programming, PLC, vision systems,
- Virtual/Augmented/Mixed Reality systems development



Available laboratories:

- Rapid Manufacturing
- Virtual Reality
- Mechatronics
- Measurement Systems



EXPERIENCE IN PREVIOUS PROJECTS

EXAMPLES

1) AutoMedPrint – Automation of design and rapid manufacturing of orthopedical and prosthetic supplies by anatomical measurement, automedprint.put.poznan.pl
R&D project

2) BRIGHT

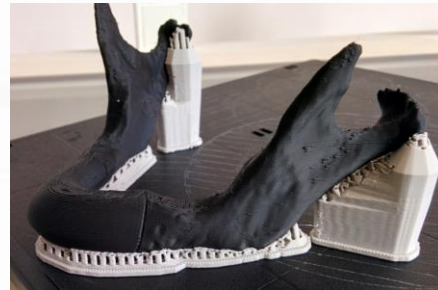
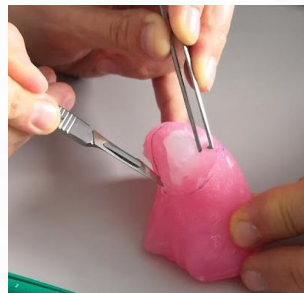
Boosting the scientific excellence and innovation capacity of 3D printing methods in pandemic period, bright-project.eu
Erasmus+

3) ErgoDesign

Improving digital skills for Ergonomics and Bioengineering
Innovations for inclusive Health Care
Erasmus+



EXPERIENCE IN PREVIOUS PROJECTS



EMERALD INTELLECTUAL OUTPUT 4

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

Aim: implementation of the communication and dissemination strategy – creating case study reports and publications

Main assumptions/deliverables:

- 4 case studies of biomimetic mechatronic systems made by 3D printing for people with special needs
- 3 different teams, 5-7 students from different countries, realization of the complete process (CAD->CAE->printing->programming->assembly)
- 4 case study reports
- 1 open access book
- 1 open access toolkit manual
- 4 academic papers (ISI, IF)

Time period: 15.02.2022 – 29.09.2023 (whole project!)



EMERALD INTELLECTUAL OUTPUT 4

Plan of conduct and responsibilities – full scale

0. Management and overall work distribution – PUT
1. Selection and medical description of cases (1 case = 1 person with special need, e.g. an amputee) – PUT
2. Measurement, anatomical digitization, data processing – PUT
3. Design of devices – mechanical part – PUT
4. Material selection – University of Bucharest
5. Design of devices – electronics & drive – Agder/Bizzcom/PUT
6. VR/AR visualization – BizzCom
7. CAE analysis – TUCN
8. 3D printing, post processing – all eligible partners
9. Assembly, programming – Agder/Bizzcom/PUT
10. Testing with patients, feedback – PUT
11. Preparing scientific papers – all University partners (1 each)!
12. Preparing toolkit manual – PUT + partner contributions
13. Preparing open access book – all partners



THANK YOU FOR YOUR ATTENTION!

Iceland
Liechtenstein
Norway grants

