RAPID PROTOTYPING LABORATORY

Contact details

Name	**Rapid Prototyping Laboratory**
Acronym	**FARAP**
Logo	
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Areas of expertise

Industrial Engineering (Rapid Prototyping of complex parts and master models for Rapid Tooling)
CAD/CAM Systems
Biomedical engineering (Prototypes, customized implants, new biocompatible materials)

Team

Prof. Dr. Eng. Petru Berce, Prof.dr.ing. Nicolae Balc,Assoc. Prof. Dr. Eng. Răzvan Păcurar Assoc. Prof. Dr. Eng. Mihai Damian, Assoc. Prof. Dr. Eng. Cristian Caizar, Assist. Prof. Dr. Eng. Horea Chezan, Assoc. Prof. Dr. Eng. Dan Leordean, Assoc. Prof. Dr. Eng Radu Sever Adrian, Assist. Prof. Dr. Eng. Ancuţa Păcurar, Assist.Prof.Dr.Eng. Cristina Borzan

Representative projects

OP3MET, **"Optical 3D Metrology - Automated in-line metrology for quality assurance in the manufacturing industry"**, European FP6 Project, (2006-2008)
Adm-ERA, **"Reinforcing Additive Manufacturing research cooperation between the Central Metallurgical Research and Development Institute and the European Research Area"**, European FP7 Project, (2011-2013)
BIOMAPIM, **"New Biocompatible Materials for personalized implants made by SLS and SLM"**, PCCE, (2010-2013)
"Innovative Manufacturing Network", (2005-2008)
"**AMaTUC – Boosting the scientific excellence and innovation capacity in additive manufacturing of the Technical University of Cluj-Napoca**", HORIZON 2020 – twinning, 2016-2018

Significant results

The most representative publications of the past 5 years:

1. Berce, P. Advances in Additive Manufacturing and Their Applications, Metals, 2024, 14(2), 165
2. Cosma, C., Teusan, C., Gogola, P., Berce, P.Balc,N. Investigation of the Interface between Laser-Melted CoCr and a Stainless Steel Substrate. In:Metals, 2022, 12(6), 965
3. Pacurar, R.; Berce, P.; Petrilak, A.; Neme¸s, O.; Borzan, C. ¸S.M.; Harnicárová, M.; Pacurar, A. Selective Laser Melting of PA 2200 for Hip Implant Applications: Finite Element Analysis, Process Optimization, and Morphological and Mechanical Characterization. Materials 2021, 14, 4240. https://doi.org/10.3390/ma14154240 (ISI-Q1, IF: 3,623)
4. O. Jucan, R. Gadalean, H. Chicinas, M. Hering, N. Balc, C. Popa, "Study on the indirect selective laser sintering (SLS) of WC-Co/PA12 powders for the manufacturing of cemented carbide parts", International Journal of Refractory Metals and Hard Materials, Elsevier, Volume: 96, 2021, (ISI-Q1, FI: 3.407); https://doi.org/10.1016/j.ijrmhm.2021.105498;

5. D. Ostas, M. Hedesiu, C.R. Roman, C. Cosma, M. Ciurea, H. Rotaru, Design Workflow for Mandibular Reconstruction. Opportunities and Limitations of In-house Virtual Surgical Planning, Journal of Medical and Biological Engineering, vol. 1, 2021, (IF 1.5).
6. C. Cosma, M. Moldovan, M. Simion, N. Balc, Impact of laser parameters on additively manufactured cobalt-chromium restorations, Journal of Prosthetic Dentistry, vol. 1, 2021 (IF 3.4).
7. S. Cuc, A. Burde, C. Cosma, D. Leordean, M. Rusu, N. Balc, D. Prodan, M. Moldovan, Adhesion between Biocomposites and Different Metallic Structures Additive Manufactured, Coatings, vol. 11 (4), 483, 2021 (IF 2.8).
8. Cosma, C; Drstvensek, I; Berce, P; Prunean, S.; Legutko, S; Popa, C.; Balc, N; „Physical-Mechanical Characteristics and Microstructure of Ti6Al7Nb Lattice Structures Manufactured by Selective Laser Melting", MATERIALS, Volume: 13 Issue: 18, 2020. Article Number: 4123, DOI:10.3390/ma13184123,
9. M. Harničárová, J. Valíček, M. Kušnerová, Z. Palková, I. Kopal, C. Borzan, M. Kadnár and S. Paulovič, A New Method of Predicting the Structural and Mechanical Change of Materials during Extrusion by the Method of Multiple Plastic Deformations, Materials 2021, 14, 2594, ISSSN 1996-1944, IF 3.057, (Q2).
10. Cosma, C; Kessler, J; Gebhardt, A; Campbell, I; Balc, N., "Improving the Mechanical Strength of Dental Applications and Lattice Structures SLM Processed", Publisher: MDPI, St Alban-Anlage 66, CH-4052 Basel, Switzerland, Volume: 13, Issue 4, Article no: 905, 2020, eISSN: 1996-1944, DOI: 10.3390/ma13040905, Published 2020, Q2-FI: 3.057;
11. Perini, M; Bosetti, P; Balc, N," Additive manufacturing for repairing: from damage identification and modeling to DLD", Rapid Prototyping Journal, Publisher: Emerald Group Publishing LTD, UK, Volume: 26, Issue 5, ISSN: 1355-2546 / eISSN: 1758-7670, DOI: 10.1108/RPJ-03-2019-0090, Published 2020, Q1-FI: 3.937;
12. Armencea, G., Cosma, C., Dinu, C., Onisor, F., Lazar, M., Berce, P., Balc, N., Baciut, M., Bran, S., Technical queries of a 3D design custom-made implant made from titanium particles for maxillofacial bone reconstruction, Particulate Science and Technology, Volume: 38 Issue 6 Pages 676-684, TAYLOR & FRANCIS INC, ISSN: 0272-6351, DOI: 10.1080/02726351.2019.1578846, Published 2020, Q3- FI=1.619
13. C. Cosma, J. Kessler, A. Gebhardt, I. Campbell, N. Balc, Improving the Mechanical Strength of Dental Applications and Lattice Structures SLM Processed, Materials, vol. 13 (4), 905, 2020 (IF 3.0).
14. M Todea, A Vulpoi, C Popa, P Berce, S Simon. Effect of different surface treatments on bioactivity of porous titanium implants, In: Journal of materials science & technology 35 (3), 418-426, 2019

The offer addressed to the economic environment

Research & development	Develop new materials, suitable for Rapid Prototyping using the SLS and SLM equipment. Rapid Prototyping using the well known CNC machines, available within DME-TUCN
Consulting	Select the optimal RP technological route
Training	Training for people from industry, in the following fields: - Using the modern RP equipment; - CNC machining; - Metrology and Quality Engineering.

Last updated: 01/20/2025