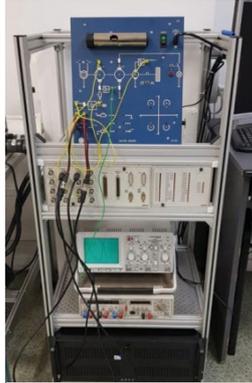
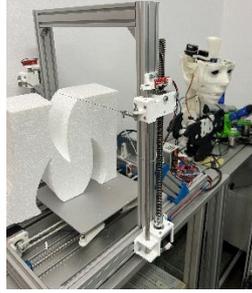


# INTELLIGENT MECHATRONIC SYSTEMS LABORATORY

## Contact details

Name	Intelligent Mechatronic Systems Laboratory		
Acronym	IMSLab		
Logo			
Site	-		
Address	Muncii Blvd., No. 103-105, Cluj-Napoca, Romania		
Faculty	<b>Faculty of Automotive, Mechatronics and Mechanical Engineering</b>		
Department	<b>Department of Mechatronics and Machine Dynamics</b>		
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## Areas of expertise

- Research and development of intelligent mechatronic products and systems
- Design and prototyping of control strategies for mechatronic systems using Rapid Control Prototyping (RCP) method and dSpace platforms
- Design and development of microcontroller based embedded system for device automation and control of mechatronic systems
- Modeling and simulations of engineering systems
- Design and implementation of Hardware in the Loop (HIL) simulations of mechatronic systems
- Advanced CAD design of mechanical and mechatronic systems

## Team

Assoc. Prof. Dr. Eng. Ciprian Lapusan, Assoc. Prof. Dr. Eng. Calin Rusu, Lecturer Dr. Eng. Ciprian Rad, Lecturer Dr. Eng. Sorin Besoiu, Drd. Eng. Marco Maries, Drd. Eng. Francisc Kadar, Drd. Eng. Vasile Sandru

## Representative projects

Advanced mechatronic systems for optimum management and efficiency increase of energy consumption (eSMART), period 2014-2015;  
 Simulation, Control and Testing Platform with Applications in Mechatronics”, CEEX, period 2006-2008  
 Research regarding advanced control in mechatronic applications”, PNII-Ideii, period 2007-2010  
 Research regarding integration and interfacing process in mechatronics, period 2006-2008  
 Smart HEI-Business collaboration for skills and competitiveness, period 2017-2019

## Significant results

### Articles in ISI rated journals, in the past 5 years:

1. Lapusan, C., Hancu, O. and Rad, C., 2022. Shape Sensing of Hyper-Redundant Robots Using an

AHRS IMU Sensor Network. *Sensors*, 22(1), p.373.

2. Rad, C., Hancu, O. and Lapusan, C., 2022, February. Data-driven kinematic model of pneunets bending actuators for soft grasping tasks. In *Actuators* (Vol. 11, No. 2, p. 58).
3. Lapusan, C., Hancu, O. and Rad, C., 2022. Numerical Shape Planning Algorithm for Hyper-Redundant Robots Based on Discrete Bézier Curve Fitting. *Machines*, 10(10), p.894.
4. Rusu, C.; Tatar, O., Adapting mechanisms for in-pipe inspection robots: a review. *Applied Sciences*, 2022, 12.12: 6191.
5. Lapusan, C., Lapusan, M., Brisan, C., Chiroiu, V., Aspects relating to development of modular design in mass customization production, Journal Proceedings of the Romanian Academy, Vol 20. Nr. 4, pag. 377-382, 2019.
6. Rad, C.R. and Hancu, O., 2017. An improved nonlinear modelling and identification methodology of a servo-pneumatic actuating system with complex internal design for high-accuracy motion control applications. *Simulation Modelling Practice and Theory*, 75, pp.29-47.

**Significant solutions:**

Matlab-dSpace research platforms for HIL-Hardware in the Loop, RCP-Rapid Control Prototyping, SIL-Software in The Loop applications

Development of hyper-redundant robotic systems with applications in fruits harvesting and manipulation

Development of a gripper with variable geometry with application in waste management

**Patents:** 1 patent

**The offer addressed to the economic environment**

Research & development	Design and development of complex mechatronic systems Design and testing of control strategies for mechatronic systems using Rapid Control Prototyping (RCP) method and dSpace platforms Modeling and simulation of mechatronic systems
Consulting	Consulting in design and development of custom solutions for mechatronic systems
Training	Modeling and simulation of mechatronic systems using Matlab/Simulink RCP in the development of control strategies for mechatronic systems Advanced CAD modeling using SolidWorks