



# Laboratory of Medical Prototypes

## Principal goals and activities

- Custom made implants
- Implant diagnostics
- Surgery prediction in reconstructive surgery
- Identification of mechanical properties of tissues
- Fatigue properties of smart materials

## Specific instruments

- **PONTOS 5M** – optical instrument for recording spatial movement of objects.
- **Zcorp 3D printer** – a powder-based 3D printer with high output resolution.
- **FEMAP** – preprocessor for preparation of finite-element models of complex geometries.
- **MSC.MARC** – FEM solver focused on solving non-linear analysis (large deformation, contact, etc.).
- **LabView** – a graphic programming language by National Instruments that is used for the development of testing, metering and control applications.

## Expert activities

- FEM calculations – stress analysis, contact tasks, large deformations, modal analysis, harmonic analysis, spectral analysis and complex tasks.
- Reconstruction of CT, MR images into 3D models – preparation of mesh and NURBS models.
- 3D printing – preparation of 3D models of reconstructions from CT (MR) data, implant design.
- Vibration and movement measurement – experimental modal analysis, measurement of spatial movement.
- Fatigue tests – preparation of S – N diagram, design of specific fatigue machines

