Biomechanics platform

Center for biomedical and healthcare engineering
STBio Lab

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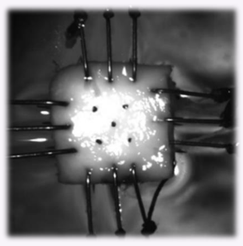
Expertise

Mechanical characterization of soft tissues and textiles

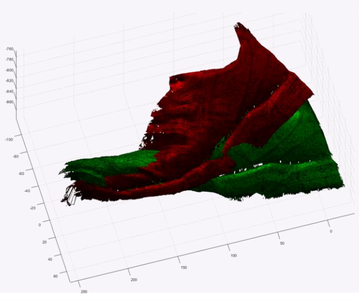
- **Constitutive data characterization**
- **Elastic modulus**
- **Visco-elasticity**
- **Anisotropy**
- **Damage**
- **Fatigue testing**



⇨ Experience with biological tissues: arterial wall, linea alba, tendons, ligaments, skin …

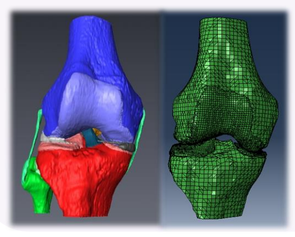
Evaluation of medical devices and sport equipment

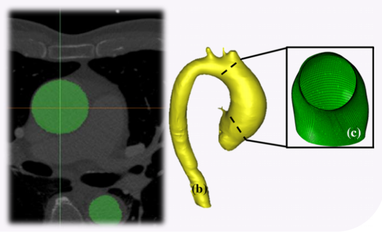
- **3D full field measurements : shapes, displacement and strain maps**
- **Interface pressure measurements**
- **In-silico evaluation of body/device mechanical interactions**



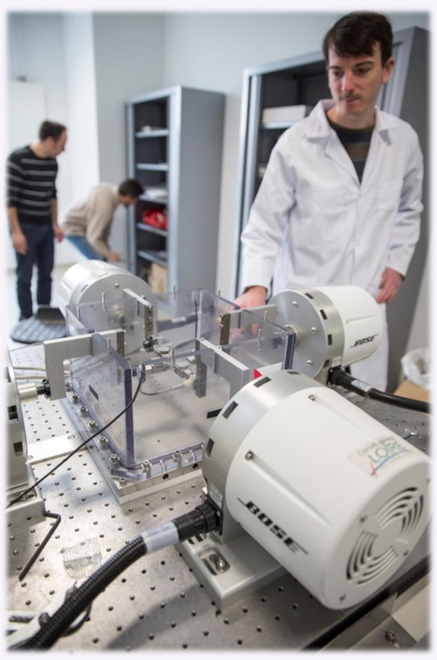
Numerical simulation

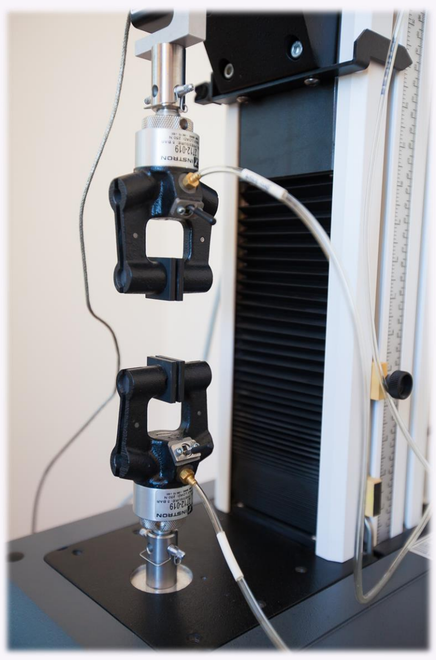
- **Model generation from medical images**
- **Non-linear finite element analysis**
- **Solid mechanics, CFD**
- **Parametric analyses**
- **Constitutive model development and implementation**



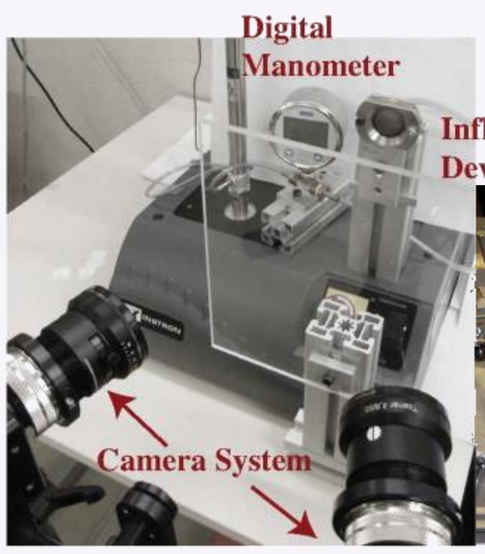


Equipment





Mechanical testing: Electroforce biaxial test bench, Instron uniaxial tensile testing machine, FSA pressure mapping system, …



Optical systems: stereo-correlation bench (with inflation test), fringe projection system, microsopes, …

Softwares

Finite element:
Abaqus, Ansys, FEBio
Image processing:
Simpleware, ImageJ
Numerical computing:
Matlab
System-design:
Labview, Arduino

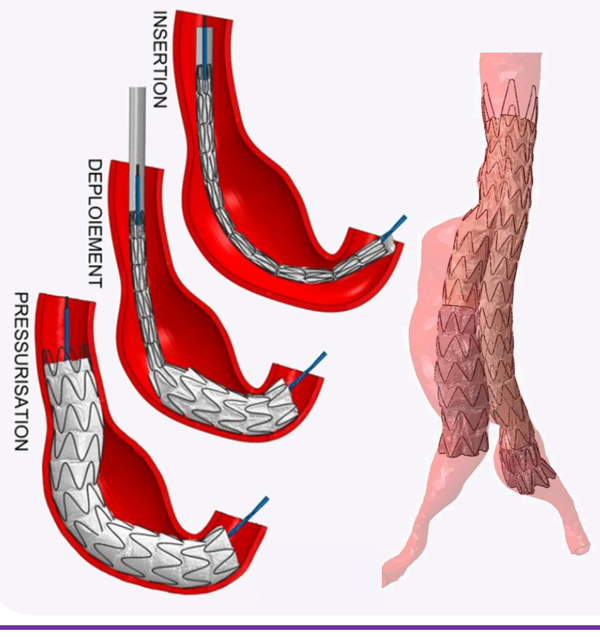
Computer cluster

for parallel computing

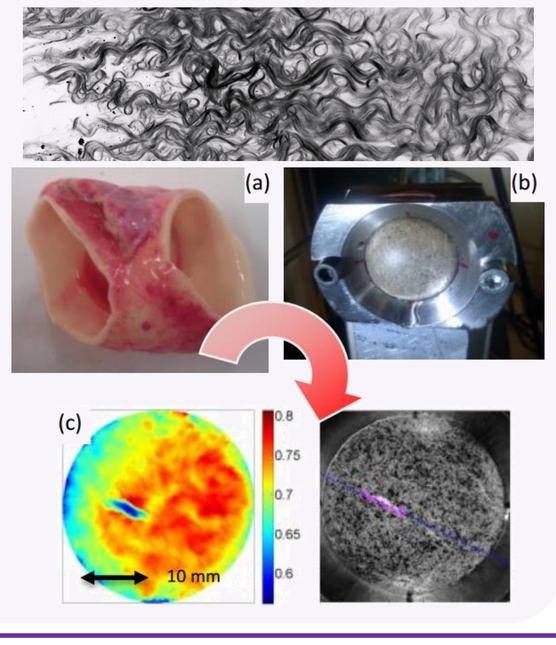
Applications

Cardiovascular biomechanics

Patient-specific computer simulations for planning endovascular repairs

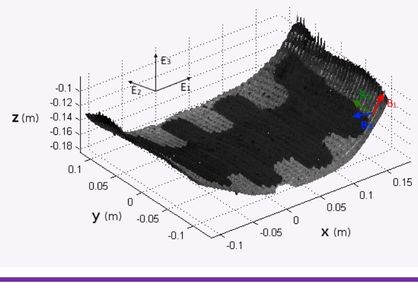


Characterization of the rupture mechanisms of abdominal aortic aneurysms

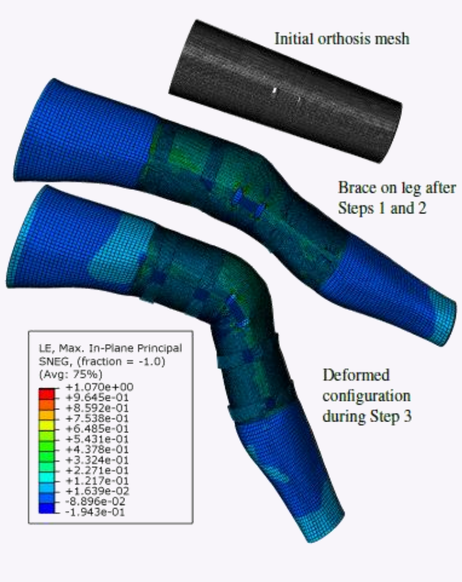


Musculoskeletal biomechanics

Investigation of pressure applied by lumbar belts



Evaluation of the mechanical effect of knee braces



… and many more…

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