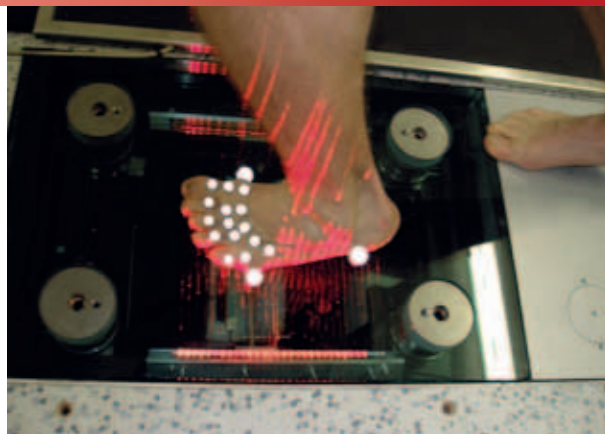


Laboratory of Biomechanics of Extreme Loads



Our mission

Biomechanics researches into questions of the functional and structural response of connective tissues, organs and systems to a dynamical stress field. The aim of the research is a mathematical expression of rheological parameters of thermo-visco-elastic tissue structures (ligaments, tendons, bones and muscles). The output is then a parametrical expression of artificial materials (nanomaterials – scaffolds, implants) as the inputs for their production; the recommendation of stress programs during restoration of the organism after an injury or an operation; and reconditioning procedures. Another focus is on issues concerning the motor interactions of man (with an emphasis on concrete tasks with respect to work security, transport, ballistic safety and the safety of free-time activities, e.g. sport), and the development of physiotherapeutic products (e.g. unstable electro-mechanical platforms, motion splints).

The department is a centre of biomechanics for the supervision of Ph.D. students for the whole of Charles University, with eight departments within Charles University and the Czech Academy of Sciences, and with accreditation for appointing Associate Professors and Professors in the field of biomechanics. It is an Expert Institute for the field

of biomechanics. The team has carried out research in approximately 30 projects of the Czech Science Foundation and Technology Agency of the Czech Republic, Ministry of Health, Operational Programme Research and Development for Innovation, and international cooperation. Their results are regularly published in IF journals, in SCOPUS and scientific monographs.

What we offer

- Consulting in the area of interaction of man and environment.
- Tests of abilities of drivers in a dynamic car simulator that, with the help of 6 controlled electromotors, enables simulation of the movements of the driver's cockpit corresponding to real driving situations, whilst observing the virtual environment of the car.
- Analysis of thermal field with a thermocamera, which enables analysis of the distribution of heat, e.g. leakage of warmth from buildings, solid and moving objects, clothes, surface of the body, etc.
- Analysis of extremely fast processes with a high-speed camera – destruction of solid objects, spraying liquids, penetration of missiles into solid and liquid materials, crash tests, consequences of blows, falls, etc.