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MINISTRY OF EDUCATION, YOUTH AND SPORTS
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INVESTMENTS IN EDUCATION DEVELOPMENT

Biomechanics at the University of West Bohemia

L. Hynčík
University of West Bohemia, Pilsen, Czech Republic
hyncik@ntc.zcu.cz

The talk presents biomechanical activities at the University of West Bohemia. It concerns human body modelling (full body and segment models) for industry and medicine, joint replacement modelling, modelling of heterogeneous materials and complex structures, biological fluids (flow in aneurysm) and experimental background.

Biomechanics at Brno University of Technology

J. Burša
Brno University of Technology, Czech Republic
bursa@fme.vutbr.cz

Biomechanics at the Institute of Solid Mechanics, Mechatronics and Biomechanics has a long tradition having started in 1980's with stress-strain analyses of some clinical problems concerning musculo-skeletal system. Later the range of investigation was enlarged to other problems with the following main achievements:

- Mechanical testing of various types of tissues, animal as well as human, and identification of their constitutive models.
- Musculo-skeletal system analyses of healthy and pathologic (hip, elbow) joints, with and without endoprostheses, simulations of various types of bone and spine fixators.
- Cardio-vascular system
  - Rupture prediction of abdominal aortic aneurysms, taking into consideration not only the undeformed geometry, but also residual stresses and intraluminal thrombus,
  - Determination of directions of collagen fibers in tissues using Fast Fourier Transformation.
- Hearing organ: computational simulations of function of human ear including ear drum.
- Vocal chords: proposal of artificial vocal chords supported by computational simulation of their function.

The division of biomechanics

M. Daniel, S. Konvičková
Czech Technical University in Prague, Czech Republic
matej.daniel@fs.cvut.cz

The Division of Biomechanics (http://www.biomechanics.cz) has a long history of research in biomechanics and innovation in orthopaedics going back to the pioneering work of Jaroslav Valenta in the 1970s. Research is performed in cutting-edge laboratories specializing in multi-level experimental and computational approaches. The Division of Biomechanics is involved

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