

Curricula for Human Motion Analysis

The new proposed educational materials of the e-learning platform include:

- A theoretical part including all issues regarding motion analysis;
- Case studies from clinic orthopedic practice;
- Case studies using up-to-date investigation methods (data acquisition and analysis using various techniques, computational modeling, etc).

Content of curricula for human motion analysis course is:

1. Physics of the human body motion

- Basic knowledge compulsory to study the human body motion like statics, kinematics, dynamics.
- Basic knowledge on material strength and elasticity theory compulsory to study the human body motion like stress, strain, deformations, etc.
- Basic knowledge on materials and biomaterials properties.

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2. Basic anatomy of human body motion

- Basic knowledge on bone tissue structure and properties. Physiology and morphology of the bone tissue.
- Effects of external stimuli on bones shape and structure. Biomathematics applied on bone structure modeling.
- Basic knowledge on joints structure. Physiology and morphology of the joints.
- Basic knowledge on muscle structure. Physiology and morphology of the muscles. Biomathematics applied on muscle structure modeling.
- Anatomic and biomechanics analysis of walking.

3. Modern techniques in human motion analysis

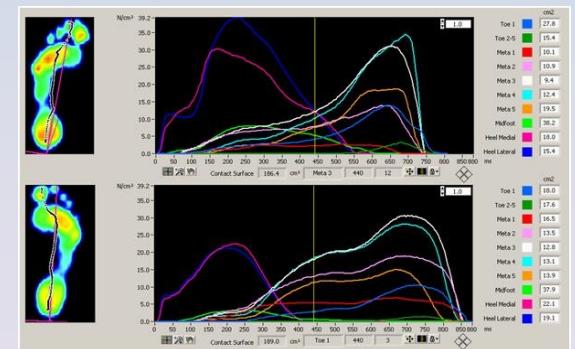
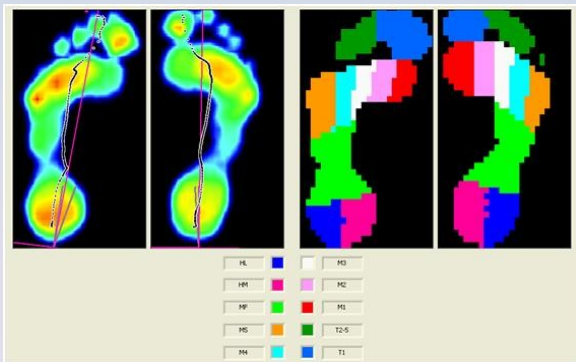
- Data acquisition and analysis of human motion using specific video analysis systems – theory and case studies
- Data acquisition and analysis of human motion using specific force/balance and contact pattern plates – theory and case studies
- Stress/strain evaluation in human musculoskeletal system using finite elements method
- Applications of the modern investigation methods on rehabilitation, motion analysis, surgical planning and prosthetics. Case studies.

Steps and Tools for Transfer of Innovation from the Project e-Medi

The aim of the ORTHO-eMAN project is to transfer the e-learning system, capabilities and expert devised content (e-learning material) of the e-Medi platform, from the subject of breast cancer to the subject of human motion analysis in orthopaedics.

The e-Medi platform consists of 3 major software parts. Two of them are custom software developed for the project and one is proprietary third party software. The modules are communicating through a XML descriptor that contains the course's logic. In ORTHO-eMAN the same architecture still applies. The two custom, project specific, software are the Authoring and Display Tool, while the 3rd party software remains the LMS. The XML descriptor is still used to communicate the course's logic between the Authoring Tool and the Display Tool.

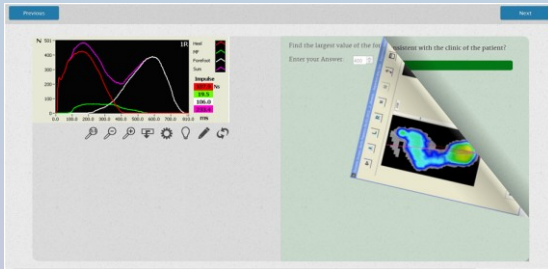
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Principle of Adaptation of Products of e-Medi Learning Platform

While the basic framework concepts are the same, the most notable differences are located in the implementation aspect in the following sectors: XML Schema, Authoring Tool, Display Tool, LMS, Operating System, Web based keyword search tool.

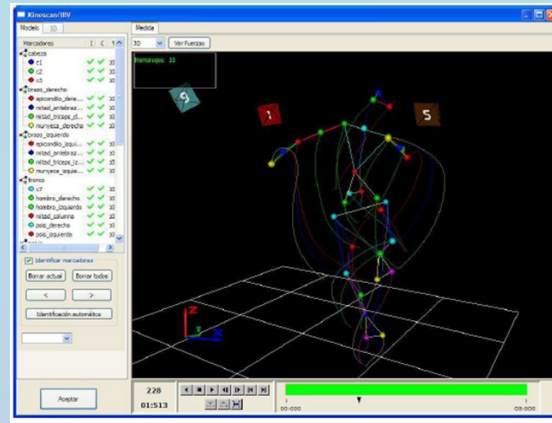
The Authoring Tool has been totally revamped and rewritten in GWT (google web toolkit) as a Web Application (webapp). GWT allows the source code of the application to be written in Java which translates to javascript in order to run in the client's browser.



The original Display Tool was a Flash based application. Due to the current advances in HTML with HTML5, it was decided to rewrite the Display Tool in a modern web friendly way.

Another major feature that is currently planned is tracking. Tracking is the ability of the Display Tool to track student's progress. Tracking is necessary for grading but also for the student's ability to pause the learning procedure and retry at a later moment.

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The chosen LMS for the ORTHO-eMAN project is Moodle (<http://moodle.org/>) which is an open source project written in PHP. It was one of the stated targets of the ORTHO-eMAN project to change the LMS due to long and difficult to solve problems of the previous LMS.

Registration for ORTHO-eMAN

The process of registration for developed e-learning course is now open. If you want to register as a trainee for human motion analysis course, you can access the ORTHO-eMAN project website (www.ortho-eman.ro), Registration menu. You will receive information about the necessary steps to graduate this course. At the beginning of the year we will test the e-learning platform. Then we will inform you when the course will begin.

The target group will be formed by residents, medical doctors in course of gaining competence especially in orthopedics and by engineers.



A web-based e-training platform for Extended Human Motion Investigation in Orthopedics

ORTHO-eMAN

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- Clinical Emergency Hospital Bucharest (Romania)
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