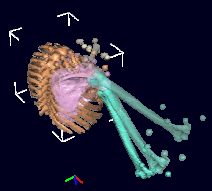


1

**Data digitising and data registration for anatomically correct modelling of the musculo- skeletal system (medical imaging, dissection and motion analysis):
The EuroPhysiome context**



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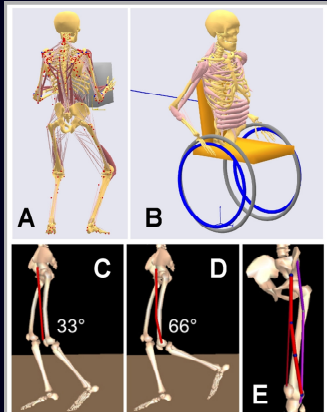


This research is partly funded by the European Commission (DG IST for Health) through the following projects:
VAKHUM, Multimod, LHDL and STEP

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2

State-of-the-Art



Anybody
<http://www.anybodytech.com>

Simm
<http://www.musculographics.com>

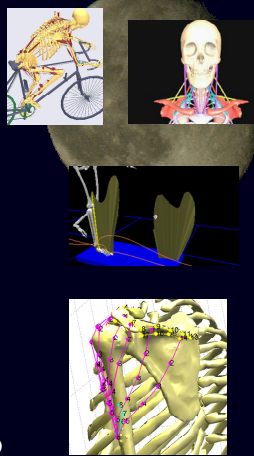
(from: S. Van Sint Jan, 2005)

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3

State-of-the-Art

- Clinical MS modeling & 3D analysis ?
 - Remains a challenge !
- Why ?
 - Customization
 - Data:
 - Hard tissue (bones)
 - Soft tissue (muscles, ligaments, hyalin cartilage)
 - Tissue behavior (kinematics, kinetics, material properties)
 - Algorithms:
 - Numerous and sometimes limited
 - Registration
 - Standardization:
 - Nihil (except frame orientation by ISB)
 - Clinical validation

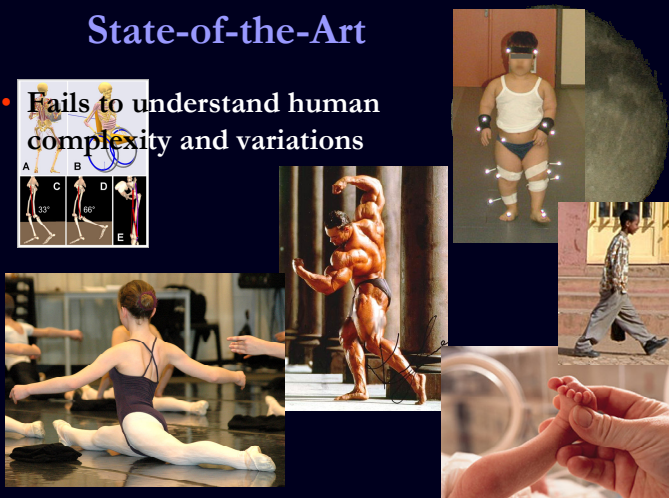


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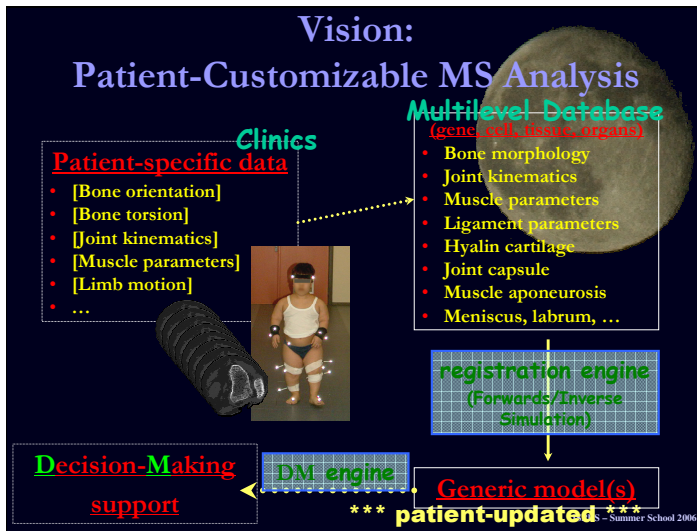
4

State-of-the-Art

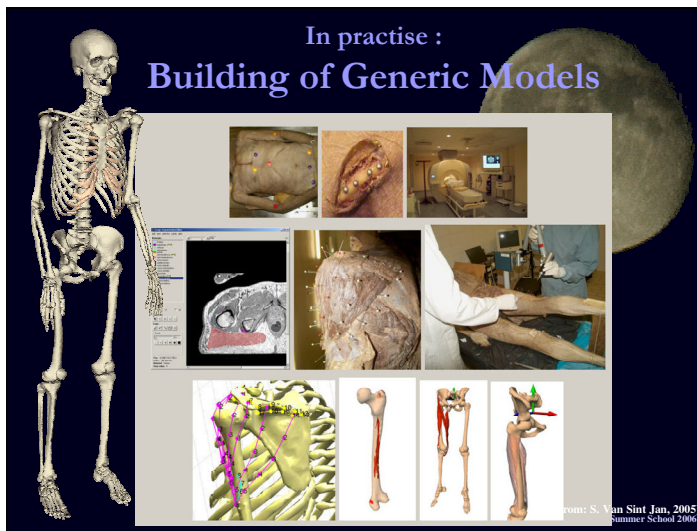
- Fails to understand human complexity and variations



5



6



7

In practise :
Preparing Generic Model Customisation - Landmarking

24. Cervical - Shoulder Joint (C/SHJ, 1)	
Figure 71 and Figure 72, In-house, C/SHJ	The upper edge of the thoracic surface is located at the superior edge of the clavicle. The superior edge is marked to the right edge.
	Locate first C/SHJ (see page 21) which is on the medial aspect of the sternoclavicular joint (SCJ) (blue line).
	The upper edge of the clavicle is located at the superior edge of the clavicle (blue line) and above the clavicle. Then, from the right edge, locate the clavicle and the right edge until the deep C/SHJ edge is found.
	For the clavicle, the superior edge is the clavicle and the right edge is the clavicle.
	Observe the clavicle from a lateral view (if possible together with the scapula). Locate the sternoclavicular joint, marking both clavicle and scapula. The C/SHJ is located in the center of the superior edge of the clavicle joint component (see Fig. 71, in-house, see page 21).
	Then observe the clavicle from a lateral view, and check that the selected point is correctly located in the center of the joint, not on the edge.

(from: S. Van Sint Jan, 2006, in press)

8

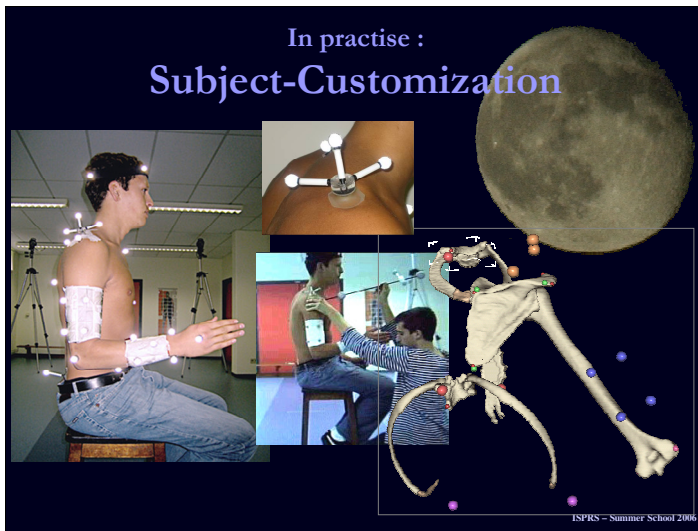
In practise :
Introducing 6-DOF Joint Kinematics

References:

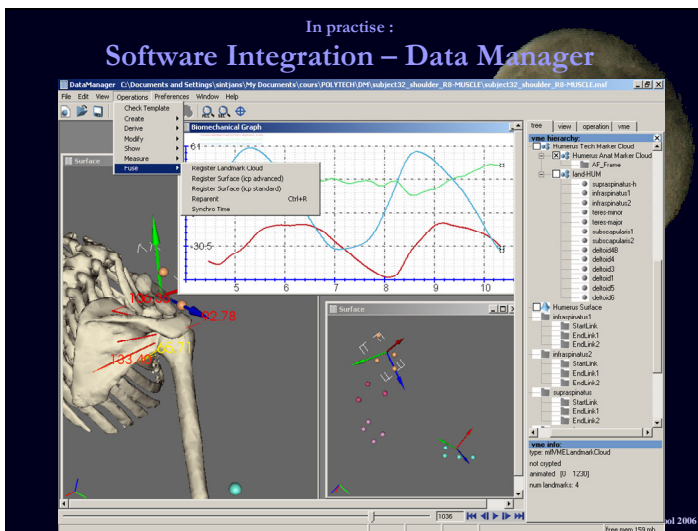
- S. Van Sint Jan et al., J Biomech, 2002
- V. Sholukha et al., Med Eng Phys, 2004
- V. Sholukha et al., J Biomech, in press

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9





10



11

Futur

- Long term effort
- Multidisciplinary effort
- Consensus (to do !):
 - Common long-term vision/project
 - Data
 - Algorithms
 - Software codes
 - Standards
 - ICT

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12



Coordination Action

- STEP project:
 - EuroPhysiome
 - FP7 White Paper
- Conferences (in Brussel):
 - STEP Conf 1: 15-16 May 2006
 - ICT-BIO: 29-30 June 2006
 - STEP Conf 2: November 2006
- BiomedTown:
 - www.biomedtown.org



STEP:

*A Strategy for the
EuroPhysiome*

References:
- J. Basingthwaite, 1993, 1997, 2000
- P. Hunter, 2003 ISPRS - Summer School 2006
