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Scientific Seminar

On the personalization of kinematic chain in musculoskeletal models

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Information

Date: Tuesday, **October 24**
10:00 AM , room Léonard de Vinci
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25 av. F. Mitterrand, Bron

Presentation in **English**

Abstract

One of the biggest challenges in biomechanics is the adaptation of a model to the specificity of each individual, to extend its applicability outside the experimental measure used for its definition.
This process, often referred as personalization, is made complex by the number of parameters that need to be tuned, as well as by the anatomical variability within any populations. A possible approach to cope with the problem is searching for invariants, properties that holds for all the individual in a population, and use these invariants to drive the personalization of musculoskeletal model. In particular, two approaches will be presented to predict individual joint kinematics starting from a simple representation of the joint anatomy taken, for instance, from CT or MR images.

Short biography

I started my studies on robotics and theory of mechanism, then falling in love with biomechanics. In my research, I exploit my mathematical background to investigate the architecture of human joints and to understand how the articular structures participate to define the joint functioning. My research activity focus on developing models capable to capture the anatomical variability among individuals, to help the definition of personalized orthopaedic treatments and devices.
During my career, I had the chance to work with different academic institutions in Europe, the United States and China. I complete my master's thesis at the University of Duisburg – Essen, under the supervision of Prof. Kecskeméthy. Then I complete a PhD. at the University of Bologna, under Prof. Parenti Castelli. During this period, I have been research fellow at Orthopaedics Research Laboratory, Rhode Island Hospital, under Prof. Crisco. I have been Professor of Foundation of Mechanics at the Tong Ji University, Shanghai, and I am now Assistant Professor in Theory of Mechanism and Biomechanics at the University of Bologna.
My research group has established collaborations with several research institutions and orthopadic company in the world. We also have a strong bound with the Laboratory of Movement Analysis of Prof. Leardini, at the Istituto Ortopedico Rizzoli in Bologna.

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